

UNIVERSITY OF EDUCATION, WINNEBA

**COGNITIVE AND TECHNOLOGY CORRELATES OF
GRADUATES' ENTREPRENEURSHIP CAREER CHOICE IN
THE KNOWLEDGE ECONOMY**



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UNIVERSITY OF EDUCATION, WINNEBA

COGNITIVE AND TECHNOLOGY CORRELATES OF
GRADUATES' ENTREPRENEURSHIP CAREER CHOICE IN THE
KNOWLEDGE ECONOMY




A Thesis in the Department of Psychology and Education, Faculty of Education, submitted to the School of Graduate Studies, University of Education, Winneba in partial fulfilment of the requirements for the award of the Doctor of Philosophy (Guidance and Counselling) Degree.

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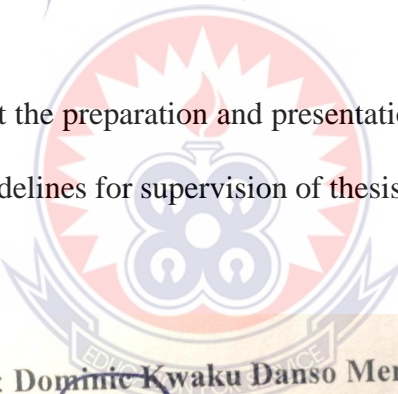
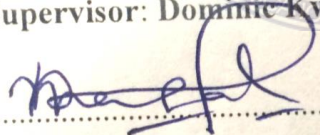
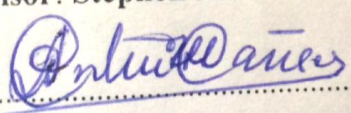
DECLARATION

Student's Declaration

I, Gideon Mensah Anapey, declare that this thesis titled *Cognitive and Technology Correlates of Graduates' Entrepreneurship Career Choice in the Knowledge Economy*, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

Signature:  Date: 16-11-2016

We hereby declared that the preparation and presentation of this work is supervised in accordance with the guidelines for supervision of thesis as laid down by the University of Education, Winneba.


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DEDICATIONS

To the blessed memory of my beloved parents, Naomi Kwasiwor Gati and
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LIST OF ABBREVIATIONS

Abbreviation	Definitions
CBAM	Concern-based adoption model
CSTI	Computer specific technology integration
DoI	Diffusion of innovation
EFA	Exploratory factor analysis
ELCM	Economic locus of control measure
FGDs	Focus group discussions
GTSE	General task self-efficacy
HEIs	Higher education institutions
HLA	Hierarchical loglinear analysis
HLR	Hierarchical logistic regression
HRM	Human resource management
ICT	Information and communication technology
ICT4AD	Information and communications technology for accelerated development
IKS	Indigenous knowledge system
MDA	Multiple discriminant analysis
NETS-S	National educational technology standards for students
nAch	Need for achievement
RTBS	Risk taking behaviour scores
SEPM	Student's entrepreneurship propensity measure
SGGS	Students grit goal-setting scores
TPB	Theory of Planned Behaviour

ABSTRACT

Economists' prescription of structural transformation and social intervention models for graduate employment are characterised by anecdotes and Westernised views at the neglect of exploring entrepreneurial career choices and indigenous knowledges with multivariate modelling in the Ghanaian setting. Hence, the concern-based adoption model, theory of planned behaviour, and post-modernism theories support the current thesis statement that graduate entrepreneurship career choice could be significant predictors of social-cognitive and technology integration literacy in the knowledge-driven society. The concurrent mixed method design was used with randomised 709 business students from seven Ghanaian public universities. Factor analysed 107- questionnaire items showed an average Cronbach alpha of 0.9 on seven latent variables. Rural Participatory Appraisal was used with 11 discussants. One-way MANCOVA and multiple discriminant analysis in IBM SPSS were applied to four main hypotheses with thematic analysis of narratives in NVivo Version 10. Multivariate and univariate assumptions (normality, homogeneity of variance-covariance matrices, linearity, independence of predictors, multicollinearity, and outliers checks) with several supplementary findings were explored. Statistically significant differences were observed between graduates' entrepreneurship career choices and social-cognitive traits. Practically, the MANCOVA model predicted 85.2% error variances in business students' ability to develop career self-efficacy, goal-setting, locus of control, reasonable risk-taking, and the need for achievement. Personal and institutional factors had a significant relationship with students' entrepreneurial decision-making. Students' critical views on their curriculum's inability to link theory to indigenous knowledges also emerged. The study concluded that cognitive-based strategies matched with technology integration are superior models for predictor youth entrepreneurial career intentions in today's knowledge-driven society. Implications for vocational guidance, parenting, curriculum design, and strategic employee selection are discussed.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Work is a relevant domain of human decision-making, and the choice of a career is equally a significant consideration made across the lifespan in many cultures (Wheeler & Shaw, 2005) coupled with tremendous expansion in higher education for many nations are resulting in increasing graduates entering the labour market (Machin & McNally, 2007). In Mncayi and Dunga's (2016, p. 414) views, the increasing number of graduates leaving universities contributes to intense competition for jobs and escalations in graduate unemployment (Hanapi & Nordin, 2014; ILO, 2015). Many nations must grapple with graduate unemployment whilst dealing with the kaleidoscopic nature of unprecedented changes in demographics and hyper-competitions (Thompson Jr., Strickland III, & Gamble, 2005). To borrow the words of Sullivan and Baruch (2009, p. 1564), "We live in interesting times, times in which established ideas about work and careers are continually being challenged." Undoubtedly, the concept of 'careers' has also evolved from the traditional linear and hierarchical progression within an organization (Super, 1957; Lent, 2005) for individuals seeking intrinsic rewards based on employer-employee loyalty (Rousseau, 1989) to the need for individuals to build flexibility in support of own career trajectories in the 1950s and 1960s (Sullivan & Baruch, 2009: p.1544). In the views of Sullivan and Baruch, globalisation, environmental changes, high technological innovations, business outsourcing, workforce diversity, reliance on temporary workers over full-time

employees, and new economic models have contributed to dismantling traditional career structures from the mid-1990s.

Kaskey (2012) shares that a major headache for graduates leaving colleges without career paths can include suffering anxiety and stress and calls for proactive career management (Picklesimer, Hooper, & Ginter, 1998). Effective career decision-making and self-management of college graduates (Jackson, 2015, p. 4) should be the apparent strategic thinking of vocational guidance and counsellors today. Others intimated that the wealth of graduate programme offerings is no longer guaranteed employment due to stiff competition in the labour market (Accenture, 2013; Ratcliffe, 2013). Hence, the need to predict graduates' career choices for vocational guidance activities confronts nations dealing with graduate unemployment, of which Ghana is not an exception.

Some newspaper commentators even attempted to link recent employee lay-offs to such rapid changes confronting firms and employees' careers and a phenomenon called '*forced entrepreneurship*' (Richtel & Wortham, 2009). Career counsellors' lamentations on the protean and boundary-less nature of emerging works today (Sullivan & Arthur, 2006) resulting from global, economic, technological, demographic, and organisational changes (Inkson, 2007) probably rekindle the need to use predictive data modelling approaches to explore graduates career choices as well. Indeed, such transformations are altering the organisation of social structures, creating what some career counsellors (Watts, 1998; Tractenberg, Streumer, & Zolingen, 2002) designated as the post-industrial society, information society or society of knowledge. Even entrepreneurial careerists attribute workers' job creations in the technology sector (Carragher, 2005) and credit crunch (Browning & Silver, 2008) to the dismantling of traditional career paths.

Reflecting on the future of international careers of a growing number of technical and professional workers in his book, Inkson (2007) drew the attention of practitioners seeking to assist cosmopolitan careerists to be more knowledgeable of, pay attention to the location-specific, contextual factors (political, economic, cultural, and technological) and lifestyles likely to impact millennials' careers. More challenging to career scholars is the revelation that many empirical studies in recent times report samples still opting for traditional career paths (Sargent & Domberger, 2007; Cabrera, 2009). Despite Sullivan and Baruch's (2009) belief that individuals' desires are driving their entrepreneurial career choices rather than modification of traditional organisational structures, Inkson's admonition could have implications for career guidance and counselling professionals in the knowledge society with rapid technological innovations and the need to predict youths' career decision-making using sophisticated analytical tools with ecological validity. The need to orient graduates to appreciate the realities of weaning traditional careers and begin to focus on non-traditional career orientation could be relevant for economic growth and managing graduate employment in the Ghanaian context. Whilst the extant literature highlights the positives of new careers in the 21st century (Currie, Tempest, & Starkey, 2006; Vardi & Kim, 2007), little is known about the implications for individuals' personality traits on new career directions (Eby, Butts, & Lockwood, 2003). Eby et al. also report that individuals who are open to new experiences, proactive, flexible, and aware of their strengths and weaknesses seem to be more effective managers in today's workplace than those who do not. Networking skills also strongly correlate with extraversion and self-esteem as survival for non-traditional careers (Forret & Dougherty, 2001).

By extension, career experts have the urgency to develop prospective and existing workers' core competencies, such as creativity, emotional intelligence, digital

literacy, knowledge, and abilities for successful career and job transitions (Reich, 1996; Lee, 2000). On such backdrop, the current study seeks to examine the social cognition, entrepreneurial career choice, demographics, and technological savvy of Ghanaian graduates today, given significant others' opinions that individuals are responsible for the management of their careers (King, 2001), to choose one's career goals, learning, and working experiences for career sustainability (Tractenberg, Streumer, & Zolingen, 2002).

Career development has significantly benefited from pioneering works in differential psychology using trait and factor theories with individuals' personalities and environmental congruence (Patton & McMahon, 2014). This approach incurred Sullivan and Baruch's (2009: p. 1563) criticism that traditional vocational theories were grounded on the premise of clear traditional hierarchical firm structures (Super, 1957). For instance, the primary locus of the trait and factor theory (TFF) of career assumes that individuals possess unique traits that can be assessed objectively and matched against the conditions of occupations and ideal working situations (Zunker, 2011). The TFF in career development is also concerned with aligning job candidates with their needs for satisfactory job performance, focusing on individual differences such as creativity and personality traits. Others operationalised workplace creativity as generating new thoughts that revamp firms' products and services (Gaither, 1996; Oldham & Cummings, 1996). In a recent McKinsey Global Survey, over 70 per cent of corporate leaders highly value creativity for organisational growth. McKinsey's findings led Montag, Maertz Jr, and Baer (2012) to submit that globally, interest in workplace creativity is growing amongst organisational scholars. In different meta-analysis findings, some revealed growing interest in employee creativity in the management literature in favour of personal and contextual factors (Zhou & Shalley,

2003), conscious and unconscious thinking (George, 2007), promoting the traits, which are considered as significant transformative agents in the knowledge economy. Career commentators are concerned with developing people skills for global entrepreneurship. Thomas and Inkson (2004) fear that careerists must increasingly interact with individuals from diverse cultures, values, and norms with emotional intelligence for workplace productivity.

Thomas and Inkson's (2004) position on cultural intelligence is even more pressing for career experts because the global economy is estimated to be undergoing structural transformation with the need for over 3.3 billion workforces. Over 75% are projected to work in the service industry by 2020 (Saxena, Pai, & Vashistha, 2014). They further estimated that technological innovations would render many jobs redundant with demands on skills acquisitions for emerging jobs. They linked such new jobs to the structural shift that would increase organisations' demand for highly skilled and sophisticated workers possessing creativity and innovation to compete in the knowledge economy. Such projections also raise concerns as to whether Ghana, with its sizeable youthful workforce and the increasing number of higher educational institutions, is strategically placed to compete with the global giants for lucrative job openings or create a pool of unemployed graduates (Maloney, 2004; Aryeetey & Baah-Boateng, 2007; Munive, 2008). Indeed, such futurists' views of jobs present a new dawn in career development. Particularly, vocational guidance and counselling services should account for indices associated with global transformations with structural multivariate techniques to predict students' career choices.

Some strategic management gurus consider the unemployment phenomenon to be perhaps due to a lack of skills and strategic thinking from stakeholders in the scientific management of their firms (Thompson Jr. et al., 2005). Slavin (2005) submits

that the classical economists' proposal of "laissez-faire" (no governmental control) was the buzzword of economics theorising with the belief that self-regulation economies could cure themselves during economic recessions that built-in forecasting toward full employment (: 352). Joining the debate on tackling unemployment, others suggest that governments' subsidies would leverage the competitive business landscape for entrepreneurial take-offs and for the informal sector to expand, industrialise, and create jobs to employ the growing numbers of graduates leaving school (Ramu, 1993). Ramu's economic views on structural transformations for job creation can be contested within available historical data on third-world countries like Ghana that had experienced diverse World Bank and IMF interventions in development and wealth creation from the 1980s. Perceptually, it is believed that the fiscal indices from such interventions have not been too good for job creation after the privatisation of industries.

In line with Thompson Jr. et al.'s (2005) strategic management thinking of building competitive organisations with required skills, some African commentators also believe that even upon privatisation, businesses are floundering due to a lack of entrepreneurship skills even by the private individuals to manage their resources for growth. Others also believe that entrepreneurship education is key to graduates' choice of careers (Kolvereid & Moen, 1997; Peterman & Kennedy, 2003).

It might be a routine for industrialised nations to refer to the global economic crunch as contributing to graduate and high school unemployment because of downsizing and employment terminations (Bohlander & Snell, 2004; Thompson Jr., 2005; Thaief, 2015). Some also link unemployment with population growth from some regions in the 1980s and 1990s, described as decades of high fertility with large cohorts now entering the labour markets. This phenomenon mandates low-income economies to integrate more than two billion young adults into the knowledge economy by the

year 2050 (Ács, Szerb, & Autio, 2015). In a preamble to the 2015 *Global Entrepreneurship Index Report*, Ács, Szerb, & Autio lamented about the results of high fertility rates in countries leading to a “labour force boom” lasting another 30 or 40 years and concluded that what the world economy most needs now is jobs (p. 1). Nevertheless, the rate and frequency at which jobs should be created remains a mirage for vocational experts, economists, planners, academics, politicians, and civil society today.

An African youth development activist, Anguala (2008), also advised that African citizens should address their contextual problems (disequilibrium) using their indigenous knowledge systems in a short speech at the *17th All African Students' Conference*. Anguala laments that the current approach to African growth spearheaded by Western ideologies lacks context and relevance; hence, self-development should be African countries' only lasting development agenda. Anguala further urges African students to demand institutions of higher learning to integrate traditional knowledge systems into their curriculum to synthesize modern knowledge in the context of the African indigenous knowledge systems (IKS). By extension, establishing businesses that tap into the African IKS could significantly enhance the creation of a country's wealth and dynamism with a competitive edge for its public and private sector businesses, which, in turn, would rely fundamentally on the capabilities of its entrepreneurs and managers.

Ghana's labour market is said to be dominated by the self-employed and entrepreneurs in the private sector. Anecdotal evidence exists that the private sector dramatically generates employment for many youths (Maloney, 2004; Munive, 2008), whilst wage earners dominate the formal sector (Naud, 2008). However, Aryeetey and Baah-Boateng (2007) believe that low incentives offered to public sector employees

have resulted in low skills development and productivity - a situation others think contributes to worker apathy and low worker morale. Others have criticised governments for over-relying on the public sector for employment generation at the detriment of private sector-led growth initiatives with entrepreneurial skills for most Ghanaian population. For instance, Aryeetey and Baah-Boateng (2013), in a later submission, indicated that while Ghana has witnessed an average economic growth of 5.1 per cent, dominated by the service industries, including the banks, in the 1980s, the country did not record significant equivalent growth rates in employment. Arguably, such discordant economic indices could be an amalgam of disequilibrium in the global economy with high-speed technological innovations altering businesses, coupled with the low technology environment that Ghana finds itself in (ICT4AD Policy, 2003; Yidana, 2007).

Increasing graduate unemployment statistics across Africa show that low-income countries constitute 16 per cent of the total, with 46 per cent in middle-income countries (World Bank, 2013). Equally, Ghana has witnessed a 7.7 per cent increase in graduate unemployment figures between 1994 and 2000, with urban youths being the worst victims (Aryeetey & Baah-Boateng, 2007; Munive, 2008). The CIA World Fact Book (2013) dichotomises the gender component of the 2000 Ghanaian unemployment figure of 10.5% for 15-24-year-olds, even with males (16.4%) and females (16.7%). Six years (1994-2000) figures demonstrated an unemployment trajectory in Ghana given the projected 4.5 per cent and 5 per cent in 2015 and 2016, respectively. Weak gross domestic product (GDP) projections by the African Economic Outlook could be an essential variable for explaining the increasing Ghanaian unemployment phenomenon. The report feared that Ghana might not be able to attain a substantial share of its GDP due to the consequences of its economic austerity measures, budget

deficits, instability of the Cedis, lack of manufacturing base, power outages and import-dependent economy, as well as not discounting the 2009/2010 world economic crunch (African Economic Outlook, 2015, p. 1). These avalanches of economic variables have probably created hardships such as graduate unemployment, leading Aryeetey and Baah-Boateng (2013) to account for the average duration for many graduates hoping to find decent jobs with 23 per cent between 15 and 24 years. Aryeetey and Baah-Boateng further estimate that 28.8 per cent of graduates between the ages of 25 and 35 have to wait for two years or more before employment.

Others advanced the theory of skills mismatch for graduate unemployment in Africa. The *Economist Magazine* (2012) reported that there were more than 800,000 private sector vacancies in South Africa in 2012. Regrettably, in 2012, 600,000 university graduates were unemployed and had difficulties finding any job. Darkwa and Adu-Gyamfi (2015) also reported that 42.3% (n = 459) of graduates sampled from Ghana's universities and polytechnics mentioned skills mismatch because they could not find jobs. Indeed, graduate unemployment has brought debates on the quality of higher education across Africa. Though Aryeetey and Baah-Boateng's (2013) statistics did not classify the type of jobs graduates had to hunt for in such periods, their submissions are relevant to the employment discourse. For example, the wait time for finding a job could create a phenomenon that Slavin (2005) describes as "discouraged workers," particularly amongst the educated youth. Before Slavin categorised the unemployed, others feared that one consequence of not finding jobs could be migration and a brain drain for economies (Todaro, 1997), which Ghana cannot absolve.

African education stakeholders continue to blame universities for producing low-skilled graduates for the job market. Summarising the interim reports of a three-year graduate's inclusiveness survey in Sub-Saharan Africa, the concerns about

graduate employability are widespread across African countries, which led Tristan McCown to ask, “How employable are African graduates in their countries?” Based on a survey of more than 5,000 final-year students, interviews, and focus group discussions in universities across four Sub-Saharan African countries (Ghana, Kenya, Nigeria, and South Africa), McCown further reveals a new generation of graduate aspirants (65% surveyed) fancied employment in the private sector than their predecessors. Overwhelmingly, 80 per cent of graduating students from Sub-Sahara Africa indicated that they would work in private and public organisations (McCown, 2015). McCown’s finding on work sector preference amongst the youth seems to have implications for graduate entrepreneurship intentions and job creation in colonised African nations. Arguably, where aspirants (graduates) choose to work are entirely issues of rights at the same time, their choices can be interrogated within the theory of Africanism, where African students are encouraged to promote indigenous knowledges as a means of combating global economic crunches (Anguala, 2008). The issue of choices informed a qualitative investigation in this study, which explored 11 participants’ preferred industries (Section 4.2.6).

The competencies of students leaving our universities today require more than reading literacy. As the US’s CEO *Forum on Education and Technology* (2001; p. 1) summarised in a publication entitled *Key Building Blocks for Student Achievement in the 21st Century*, “the definition of student achievement must be broadened to include 21st-century skills that would be required for students to thrive in the future”. The world in which our students live is significantly different from that of yesterday, using handheld devices, instant messaging, and smartphones to connect to friends, families, and subject matter experts worldwide (Shelly, Cashman, Gunter, & Gunter, 2006). By extension, active participation in the information-rich economy requires diverse ICT

skills on the Internet, social media, digital creations, and entrepreneurial competencies (Oblinger, 2012). The digitisation of business processes and enterprise solution systems is increasing across continents. Growing calls for African countries to promote sustainable growth and adopt modern economic structures focusing on innovation and technological development have become more urgent (World Bank, 2013).

The recognition of the changing nature of employment markets and the need to develop a broad range of attributes, including multidisciplinary knowledge, so-called ‘soft skills’ and practical experience, have also been documented in Sub-Saharan Africa (McCown, 2015). Concluding the summary of the graduate employability and inclusiveness survey report, McCown reveals that even though Sub-Saharan African students are accessing diverse kinds of skills development courses, extracurricular activities and work placements necessary to equip them for the job market, they need extra support for particular less prestigious universities across Africa. In the opinion of this dissertation, such interrogatives could indicate the role of African institutions of higher learning in addressing graduate knowledge gaps, modern approaches to educational content delivery, and technology integration at the hub of innovative teaching and learning. Therefore, curriculum design, implementation, and evaluation issues must be examined within the context of students developing competitive skills for the emerging markets in Africa.

Whilst literature on the African higher education debate has been sparsely documented with anecdotes (IMANI Ghana, 2013; Abu, 2012; Hardi, 2012; Dogbevi, 2007) rather than empirical studies, it seems less documentation on graduate employability is known (McCown, 2015; Ananga & Anapey, 2015). Also, educational stakeholders have questioned the issue of graduates' destination, the impacts of higher education on national development, and students' entrepreneurship competencies

(British Council, 2013; Brito, 2014; Ncayiyana & Hayward, 2014; Frimpong, 2016). In his views, Frimpong (2016) believes that whilst the Ghanaian secondary education sector is expanding, he questions the low quality of skills from training institutions, which have insufficient resources allocated to vocational and technical schools. Atef and Al-Balushi (2014, p. 2) believe that tomorrow's potential entrepreneurs are today's students. Bruyat and Julien (2000) ascribed that new venture creation by entrepreneurs puts enormous demands on vocational guidance and school counsellors today.

Inevitably, African students would require extraordinary entrepreneurial competencies to innovate and re-engineer businesses. As a resource, entrepreneurial talent influences the nature of economic activities and their subsequent implications for nations' growth (Douhan & Henrekson, 2008a). Sometimes, entrepreneurship is also viewed in light of activities concerning selling products or services in a market. Jain (2011) also posits that entrepreneurship is no longer the preserve of business entities; instead, it occurs in diverse human endeavours within an existing organisation. Employees, home managers, non-governmental firms, and private businesses require creative minds to identify opportunities amid chaos and devise strategic moves towards increasing productivity. Therefore, it behoves today's students to cultivate entrepreneurial propensity, which is the motif of an individual believing in an innovative plan to achieve it (Bird, 1988). Jain's proposition that entrepreneurship is no longer a preserve of equity owners is justified within the context of high-frequency technology innovations altering jobs and family wages (Fang & Silos, 2012, p. 4). The relatively short life spans of technologies are equally creating panic and fear for businesses (Thompson Jr. et al., 2005). However, it will require ingenious and creative minds in organisations and society to identify entrepreneurial opportunities to take advantage of the economic upheaval by technology innovators. These innovative minds

reside in the young graduates produced by today's universities and colleges. University students' technology integration literacy would be required to contribute significantly to business activities they would be engaged in (Shelly et al., 2006).

The empirical literature has identified several entrepreneurship competencies for job creation. For instance, Rezaie-zadeh, Hogan, O'Reilly, Cleary, and Murphy (2014) used 60 peer-reviewed articles from different contexts to develop comprehensive skills associated with entrepreneurs. Some emerging themes from their work reveal psychological constructs such as goal-setting, locus of control, extraversion, creativity, risk-taking, need for achievement, decision-making, self-confidence, and stress and failure coping. Rezaie-Zadeh et al. also identified management skills (motivation, leadership, risk perception, vision, communication skills, conceptual skills, autonomy, & financial management), ICT proficiency, and job skills (e.g. practical work experience and market analysis). The participants in their survey also recognised a cluster of emotional, motivational, cognitive, and interpersonal competencies as essential to successful entrepreneurs. Their study's top six influential entrepreneurial skills are determination, ability to make decisions, questioning everything, communication, ingenuity, and competitiveness.

Similarly, Jain (2011) conducted a meta-analysis of entrepreneurial competencies and laments that despite numerous research works on why, when, and how entrepreneurs are discovered, intensive investigation is still needed to examine intrinsic and extrinsic variables related to entrepreneurs. Researchers agreed that entrepreneurial competencies could indeed be learned, at least to some extent (Blenker & Christensen, 2010; Nekka & Fayolle, 2010), with others arguing for entrepreneurship education to enhance the skills of would-be and extant entrepreneurs today (Rezaie-Zadeh et al., 2014). Consequently, career guidance and counselling experts can assist

students in developing entrepreneurial skills within the African Indigenous Knowledge Systems (IKS), as Anguala (2008) advocates. The need to promote IKS in the context of 21st-century skills calls for developing nations to qualitatively and quantitatively expand their higher institutions to contribute to economic development, providing opportunities for individuals, promoting cultural diversity, political democracy, and trade has been advocated by scholars (Rena, 2010). Similarly, Rena has demanded public interest in superior quality, efficiency, rigour, relevance, and learning. Therefore, with Ghana's liberalised tertiary education space allowing private sector participation over the past decade, it is heart-warming that Ghana has many university scholars. However, burgeoning questions remain on quality, employability, access, equity, authentic knowledge that relates theory to practice, and global competitiveness of degree holders to compete for jobs in the labour market for students leaving today's public and private higher education institutions (HEIs) (Abu, 2012; Dogbevi, 2007; IMANI Ghana, 2013; McCown, 2015). Specifically, (a) How competitive are our university graduates in leading existing and new businesses with core competencies required of them in the global knowledge economy? (b) What indigenous African knowledge systems influence Ghanaian graduates' productivity? More so, (c) are students becoming employable after leaving school? Such interrogation of the quality of Africa's HEI has frequently occurred, with the nation's stakeholders questioning the widening skill gaps of university graduates. For instance, the CEO of the Ghana Employers Association states, "Whereas demand for higher education is growing and enrolment in tertiary institutions has continued to expand, the requisite skills needed for industry continues to decline." (Frimpong, 2016, p. 34).

Hence, to answer some of these questions, there has been an increasing advocacy for higher education institutions (HEIs) to promote lifelong learning and 21st-

century skills within rigorous academic standards. Education futurists are branding 21st-century skills as a panacea for enhancing students' authentic knowledge using ICT tools (Kerry et al., 2000). The ubiquitous technological advances are generating increased access to education that involves new and underserved communities to improve educational delivery in and outside classrooms and generate competition amongst universities (Drabier, 2003). Drabier questions higher education's fragmented, compartmentalised, and autonomy and concludes that such narrow strategies only lead some higher institutions into dogmatic thinking, thereby relatively slowly accepting technology in their curriculum and stifling innovation in HEIs. Sullivan and Baruch (2009:5161) warned, "Universities that prepared their students for lifetime linear employment within one or two firms need to consider strategies to prepare students for alternative, multidirectional career paths." Though anecdotal, Sullivan and Baruch's counsel should concern Ghanaian educational policymakers. Tertiary institutions must reconsider their curriculum design to account for technology integration, allowing multi-skills development, entrepreneurial career choices, and confidence for emergent jobs requiring sophisticated technological innovations and big data analytics.

Futuristic thinking calls for educators to integrate technology literacy, innovative thinking, creativity, collaborative skills, economic and social literacy, high productivity, and practical communication skills into their curriculum as desired skills of businesses today. A review of the entrepreneurial competency literature also emphasised the 21st-century skills of students. It is worth asking if Ghanaian business graduates are equipping themselves with 21st-century critical thinking skills, digital innovativeness, and focused strategic thinking, coupled with the proper psychological dispositions to make significant contributions to personal and societal development in the knowledge society.

What is the thesis statement guiding this study? According to Mason (2002: 17), a good scientific study at an early stage identifies its “intellectual puzzle and how it guides ontological and epistemological foundations of the study.” She further suggests that an intellectual puzzle should address the theoretical contributions of a study. Hence, researchers should position their work in a narrow framework led by a thesis statement answered at the end of data collection. This thesis challenges the neo-classical economists’ assumptions that unemployment is mainly a function of a nation’s structural and economic indices (Ramu, 1993) and submits that cognition and technology integration models present a much superior perspective to addressing Ghana’s phenomenon of graduate unemployment in today’s knowledge-driven society. Also, two overarching themes (curriculum and Indigenous entrepreneurship experiences) were found to be collective expressions of critical theory and anti-colonialism. Dei and Asgharzadeh’s (2001) thoughts on social theory show that individuals can be understood within specific institutional nuances. Their view also guided the present study by defying the Westernisation of Africa’s problems and attempting to explore what informs Indigenous choices and behaviours from socio-cultural perspectives in guidance and counselling. The works of Africanists who propose integrating indigenous knowledge systems to solve the continent’s issues (Foucault, 1980; Dei, 2012; Anguala, 2008) significantly underpinned discursive approaches to results analysis in this dissertation. Furthermore, the current study reflects the maximalists’ approach using multivariate approaches and a focus group discussion to explore business students’ stages of entrepreneurship development in Ghanaian public universities.

Deductively, the current segment adduces shreds of evidence from career guidance and counselling, economics, technology, social commentators, and post-

modernism to prove the evolving thesis position underpinning this study. Vocational choices and career development advocates have dominated counselling practices with personality interest and environment-fit theories (Cattell, 1966b; Holland, 1959) for achieving congruence in the Western academy. One such congruence is to help young graduates transition smoothly between school and work. Conversely, the burgeoning challenges facing nations and families' purchasing power invariably question the classical career developers' models of matching individuals to nonexistent work today in favour of a more pragmatic approach in explaining students' cognition in creating their indigenous jobs (Anguala, 2008) rather than being job seekers in the society of knowledge (Sullivan & Arthur, 2006; Inkson, 2007). Richard Florida of *The Flight of the Creative Class* fame sums up the background of the current study; "I call the age we are entering the creative age because the key factor propelling us forward is the rise of creativity as the primary mover of our economy". (Florida, 2007). Hence, the present study attempts to address the contemporary issue of graduate entrepreneurial career intentions from vocational guidance and counselling.

1.2 Problem Statement

Anecdotal views suggest that increasing numbers of graduates are leaving Ghanaian universities today, and the proliferation of private and public universities is also heart-warming; the labour market might be the direct beneficiary of abundant human capital (IMANI Ghana, 2013) with a substantial nexus between education and employment. Career development practitioners recognise the significant contributions of entrepreneurial career choice to nations' social and economic growth (Kuratko, 2005), with others' reservations about its impact and effectiveness on job creation and sustainability (e.g. Pittaway & Cope, 2007). Ghana can pride itself on having a growing literate population with emerging tertiary institutions for job generation.

Juxtaposing the structural transformation entrepreneurship model of Ramu (1993) with global economic indicators, the growth of nascent entrepreneurs across 58 global entrepreneurship monitor (GEM) countries in 2016 averaged between 3.2% and 10% gender gap in social entrepreneurship formation in favour of males' 55% rate (Bosma, Schøtt, Terjesen, & Kew, 2015). The 2016 GEM Report rates Sub-Saharan African countries (Botswana, Senegal, and Cameroon) low on social and commercial entrepreneurship intentions. Though the GEM Report did not cover Ghana, narrative reports show failure rates of Ghanaian businesses in the current age of entrepreneurship-led and innovative economic development. Illustrating that 150 Ghanaian registered companies could not sustain operations in 2010 alone (Gadugah, 2010), with more than 30 registered microfinance companies folded up in 2013 because they could not maintain their operations amidst varied challenges (GBN, 2013). Indeed, Ghana cannot escape the vagaries of the global economic crunch, with stocks plummeting in 2010, which might impact start-ups globally. Expressing views on why Ghanaian firms sometimes fail, some cite the relics of colonialism and the penchant for foreign goods and services as neglecting indigenous ones (Darko, 2011). Whilst this dissertation acknowledges infrastructural and government policies geared towards job creation, it is feared that little work has been done to tap into the inherent potential of individuals to build their businesses or expand current work environments in which they find themselves using cognitive and entrepreneurial traits. In addition, the increasing graduate unemployment figures also raise concerns for career counsellors. Statistics showed that 46% of unemployed persons are in middle-income countries (World Bank, 2013), with a 7.7% rate recorded between 1994 and 2000, with urban youths being the worst victims in Ghana (Aryeetey & Baah-Boateng, 2007). Empirically, the 2015 *Labour Force Report* showed that 67.87% (n = 848,953) of

unemployed Ghanaians are between 20 and 39 years (Ghana Statistical Service, 2016, p. 57). A significant fraction of the youthfully unemployed might be graduating from tertiary institutions with high hopes of finding gainful jobs – often non-existent due to the changing demographics and nations' poor economic indices. In the face of increasing unemployment figures, populists' rhetoric seems to dominate national discourse instead of analysing scientific data on Ghanaian graduates' capabilities to create jobs (e.g., Munive, 2008; Darkwa & Adu-Gyamfi, 2012; Aryeetey & Baah-Boateng, 2013). Similarly, career guidance and counselling gurus (Inkson, 2007; Sullivan & Baruch, 2009) have yet to employ analytics to question the competency levels of university graduates, which McCown (2015) whimsically interrogates Ghanaian graduates' employability skills. In addition, the complex pattern of the global economy and fast technological innovations pose more significant challenges to nations and jobs (Thompson Jr. et al., 2005; Oblinger, 2012) and entrepreneurship career development amongst the youth.

Indeed, adolescents' career decisions have always been a preserve for parents, families, and significant others in society. Unfortunately, such 'experts' might not be privy to ecologically validated inventories based on Ghanaian culture, norms, and values as guides to youths in career development decisions. Probably, the Ghanaian literature on guidance and counselling has been dominated by career counsellors' over-reliant on person-environment-fit models to account for individuals' career interests (see Buku, 2014) with Westernised career development theories that neglect Africa's socio-cultural variables (Asante, 1995; Dei, 2012; Leung, 1995). The use of multivariate approaches to study graduates' career choices might also be limited (e.g., see Buku, 2014). Hence, using factor-analysed entrepreneurship career instruments to explore graduates' entrepreneurship careers from Ghanaian public universities could

immensely benefit career developers within the African context. Thus, careerists' over-reliance on univariate statistics to explain entrepreneurs' careers has been criticised by Jain (2011), who advocated for multivariate techniques to address the phenomenon. Aligning Jain's proposition with Africanists' views of indigeneity and vocational psychology literature that connect individuals' careers with their interests and personality traits (Holland, 1997), the current study sought to investigate which social-cognitive traits, technology integration, and demographic variables align with business graduates' entrepreneurial career interests, using multivariate techniques in the Ghanaian context.

1.3 Purpose of the Study

Guided by indigenous knowledge systems, the central thesis statement guiding this research posits that holding technology integration literacy constant, cognitive, personal, and institutional traits are significant predictors of Ghanaian students' entrepreneurial propensity with a strategic approach to graduate employment in the knowledge economy. Accordingly, this study used MANCOVA and multiple discriminant analysis (MDA) techniques to account for variations in Ghanaian business students' level of entrepreneurial propensity. Two in-depth interview sessions also examine students' lived experiences with contextual issues (indigenous knowledge systems, business curriculum, and technology integration) on entrepreneurship development. MANCOVA and MDA are multivariate statistics that predict the relationships among covariates based on observed data points and expected frequencies and means by the model (Hair Jr., Black, Babin, & Anderson, 2014). Using multivariate techniques for the current study is to fill an analytical gap recommended by Jain (2011) to explain influential factors accounting for entrepreneurs' career decision-making. Thus, what percentage of variances in business students' entrepreneurial career choices

explains their technology integration literacy, social-cognitive traits, and demographic variables in the Ghanaian public universities towards job creation in the knowledge society? Above all, the thesis examines Vygotsky's sociocultural theory, psychoanalysts' frameworks, and Holland and associates 'big-five vocational choice theories.

In proof of the thesis statement, two specific objectives guided the research.

These are to:

1. predict the contributions of technological, cognitive, institutional, and personal traits to Ghanaian business students' entrepreneurial career decision-making in the knowledge economy and
2. explore business students' views on their curriculum experiences (relating theory to practice and computer integration) and indigenous business knowledges for entrepreneurial career choice.

1.4 Research Hypothesis

Four main null and alternate hypotheses on the *Research Objective 1* guided the study as follows:

1. **H₀1:** business students' entrepreneurial career choice levels will not significantly predict their social-cognitive traits,
2. **H_A1:** business students' entrepreneurship career choice levels will statistically explain significant error variances in their social-cognitive attributes,
3. **H₀2:** students' personal traits (PTs) will not explain their entrepreneurial career decision-making,
4. **H_A2:** students' PTs are significant determinants of entrepreneurial career choice levels in the Ghanaian context,

5. **H₀₃**: institutional variables are non-significant predictors of Ghanaian business students' entrepreneurial career choices,
6. **H_{A3}**: institutional factors are more likely to account for large variations in students' entrepreneurial career choices in this study,
7. **H₀₄**: business students' stages of technology adoption, goal-setting, and self-efficacy behaviours are non-significantly related to students' gender traits in the Ghanaian environment,
8. **H_{A4}**: gender is a significant predictor of students' STA, goal-setting, and self-efficacy scores in this study.

1.5 Research Questions

Maison (2010) proposes that academic research projects must seek to unravel intellectual puzzles at the end. Consequently, to fulfil the two broad research objectives guiding this study, two overarching puzzles grounded in several background theories, such as indigenous knowledge systems (Foucault, 1980; Asante, 1995; Dei, 1996), set the tone for this study. The research questions are:

1. What are the perceptions of graduating business students on their overall curriculum? and
2. How do students integrate their business curriculum with indigenous knowledge systems as part of entrepreneurship career awareness in the Ghanaian context?

1.6 Scope of the Study

This study applies multiple perspectives from psychology, management, and technology to advance theoretical knowledge in entrepreneurship study in the Ghanaian context. Contribution to African literature is acknowledged with the use of postmodernist ideologies. This study also questions the institutional convention of

structuring research reports, with many graduate programmes requiring student researchers to follow a pattern of stating a hypothesis in their introductory chapter. This study differs in advice based on nomothetic and deductive reasoning governing scientific inquiry (Babbie, 2010). Nomothetic views follow several assumptions, such as independence of scores, normal distributions of scores in a population, and equality of variance (Jackson, 2009; Howell, 2010; Howitt, 2011). Therefore, nomothetic conditions must be justified before *hypothetico-deductive* reasoning (Field, 2009). Hence, this thinking guided the approach to research designs employed in this study with statistical proof for Research Question 1. Though four null and alternate hypotheses were stated in this section, they were based on univariate and multivariate assumptions provided in Sections 3.10.0 to 3.10.6 (*see* the methodology chapter of this thesis).

In addition, stating specific research questions for qualitative study seems contradictory to the long-held acceptance that phenomenological investigations are emergent (posteriori) in nature (Bryman & Burgess, 1994; Yin, 2001). Hence, themes are likely to emerge based on the narratives from cases, coding, interpretations, analysis, and validation (sometimes different from predefined questions). Hence, Research Questions 1 (survey) and 2 (FGD) guided the study. Whilst the FGD data was only used to generate themes after coding in NVivo Version 10 (QSR International Pty Ltd, 2009), the survey dataset provided a basis for hypothesis testing after establishing necessary conditions for inferential assumptions testing underlying nomothetic views in scientific research (*see* Section 3.9). Similarly, inductive reasoning was employed to generate theories from the qualitative data.

In addition, the theoretical and conceptual framework (Figure 1) provides the scope of the current study. Cognitive-based theories of self-efficacy, goal-setting, need

for achievement, locus of control, and risk-taking behaviour are psychological predictors in the structural equation model. Technology integration literacy sought to examine students' conceptualisation of ICT learning and application to a wide range of tasks such as creativity, ethics, communication, and document processing for business curriculum integration. Indeed, Section 3.5 outlines the details of factors measured and computed for hypothesis testing in the present study.

However, entrepreneurship has been broadly conceptualised to include students' ability to use various skills, including managerial, technological, and cognitive traits, to adapt to one's environment (indigeneity). In addition, the concept used in this study defies the popularly held view of only owning a business entity – but includes graduate entrepreneurs likely to work for existing firms.

1.7 Significance of the Study

The model's significant contributions to theory, literature, and career development for youths' entrepreneurial career choice research. Theoretically, the study's outcome could be seen in differential psychology, where trait models pioneered by Cattell (1966b) and later by Holland (1959) are widely employed in personality studies – a current research focus. Similarly, the concern-based adoption model (Hall & Hord, 1987), diffusion of innovation (Rogers, 1995), self-efficacy (Bandura, 1982), goal-setting (Locke & Latham, 2002), locus of control (Rotter, 1966), need for achievement (McClelland, 1965), and risk-taking propensity (Sunstein, 2008) are relevant to the current study of the entrepreneurship intention amongst Ghanaian business graduates.

Specifically, the current study extends knowledge on students' entrepreneurship study from multiple perspectives, including:

- i. dominantly, the use of multivariate techniques to predict students' entrepreneurial

career choices in the Ghanaian context offers additional insights into psychometric testing for counsellors likely to guide students' vocational decision-making based on social-cognitive and technology traits within the Ghanaian educational system,

- ii. the second contribution of the current study is the developmental stages of entrepreneurial career choices using discriminant function variates as an extension of multivariate techniques with MANCOVA for Hypothesis 1. Based on the extant literature's presumption that entrepreneurship intention is a universal trait for individuals in a population (e.g. Aldrich et al., 1986), the current study contests such assumption and proposes that environmental conditions such as technology and infrastructural resources (Vygotsky's socio-cultural theory) have the tendencies to categorise individuals into three stages of entrepreneurship. Level 1 constitutes the low awareness group who might have little or no entrepreneurship traits, whilst Level 2 is the moderate adopters of entrepreneurship career choice with the last stage, Level 3 were advanced entrepreneurial decision-making individuals who might be constantly innovating, showing creativity, creating newness, and seizing opportunities during chaos. Categorisation of entrepreneurial career choices in the current study presents career counsellors with a more sophisticated and predictive testing approach in the isolation of entrepreneurial averse students, to providing support for moderate and high entrepreneurs categories in schools and workplaces, and
- iii. thirdly, this study offers a psychometric testing approaches to human resource managers interested in recruiting best talents to propel their organisations into the knowledge economy. While emerging jobs require prospective employees to exhibit multiple skills, such as innovative thinking, team spirit, communication,

technology literacy, and cultural literacy, measuring such traits remains a challenge to many. Therefore, the factor analysed instrument on cognitive-based traits (goal-setting, self-efficacy, need for achievement, locus of control, risk-taking propensity) and stages of technology adoption in the Ghanaian context could be of significance to human resource managers, governments interested in youth entrepreneurial career support, entrepreneurship researchers, and policy think tanks on solving the unemployment saga.

1.8 Definitions of Constructs

The literature review also explains primary constructs in the theoretical and conceptual framework. However, the following operational definitions are provided to guide the study:

- **The academic programme** in this study is a concept that denotes six areas of specialisation. These are financial accounting, human resource management, marketing, banking and finance, health administration, and general management.
- **Institutional Factors** are students' extra-curricular activities such as sports, club membership, radio, and print journalistic works on campus.
- **A social-cognitive trait applies** to cognition, a loose categorisation of five mental traits exercised by respondents with environmental determinism (accounting for social variables in decision-making). These are belief in self and personal competencies on general tasks (self-efficacy), perseverance and passion for achieving individual goals (goal-setting), desire to accomplish personal roles (need for achievement), avoidance of unfavourable school-related situations likely to inure to learners (risky behaviours), and accepting personal

responsibilities for financial success in life (economic locus of control).

- **Entrepreneurship** is an approach to creating newness using appropriate technologies in value creation, and an individual's cognitive capability to generate innovations geared towards solving personal or group needs with managerial thinking and environmental scanning to attain competitive advantage in formal or informal business sectors.
- **Entrepreneurship Seminar** is a count variable referring to university students' entrepreneurship conferences and workshops attended.
- **Leadership Position** consists of students' leaders of registered bodies at the university.
- **Personal traits refer to** a label that includes respondents' age, birth order, and parenting style.
- **Sex** is used as a biological categorisation of students' gender.
- **Technology** refers to students' and lecturers' application of computer-based tools such as computers, multimedia, spreadsheets and the Internet used for teaching and learning.

1.9 Organisation of the Rest of the Study

The rest of the study is organised into five chapters. Chapter Two deals with a literature review based on background theories such as critical discourse analysis, Afrocentrism, and institutional and critical theories. In addition, eight focused theories (Theory of Planned Behaviour, Self-Efficacy, Goal Setting, Locus of Control, Need for Achievement, Risky Behaviours, Diffusion Of Innovation, and Concern-Based Adoption Model) underpin the current study. In addition, Chapter Two discusses socio-cultural theory with Holland's Career Choices as background theories in discussing the

results.

The pragmatic paradigm underpins the data theory governing Chapter Three of this dissertation. Research design, sample selection, instrumentation, ethics, data validation, and analysis are carefully presented within the objectivist and interpretivist realms. In this chapter, justifications for multivariate and univariate models for hypothesis testing and supplementary findings are espoused with philosophical assumptions guiding data generation and testing.

Following the methodology chapter, the study presents the findings within the set rules of the hypothetico-deductive model and thick descriptions of participants' lived experiences on ICT and business curriculum to their entrepreneurship knowledge in Chapter Four. The thesis statement guiding the current study is answered in this chapter, and several post-hoc analyses are reported. Four main research hypotheses are reported, with five supplemental hypotheses also formed and reported in the result chapter with multivariate univariate charts, tables, and thematic analysis.

In addition, the penultimate chapter hosts background theories such as diffusion of innovations, Adlerian's theory on family constellations and birth order development to discuss students' entrepreneurship developmental stages in this study. Similarly, cognitivism, critical theories of education, and Afrocentric theories offer a rich discussion of key findings in Chapter Five. Finally, Chapter Six summarises the study by highlighting important literature, theories, and methodological issues. Above all, noticeable findings that answered the overarching thesis statement for this study are outlined with conclusions, recommendations for diverse groups such as guidance and counselling professionals in universities and strategic human resource management practices are suggested.

CHAPTER TWO

LITERATURE REVIEW

In addition to choosing a research paradigm, Creswell (2012) offers valuable suggestions when reviewing scholarly literature. He submits that a literature review helps scientific investigators establish the scope of their enquiry and the importance of studying a research topic. Similarly, Tranfield, Denyer, and Smart (2003) recommend the establishment of a review protocol comprising the research question, population of interest, the sample, and the criteria for search and inclusion of related literature. Tranfield et al.'s view relates to what Creswell calls drawing a literature map to guide a scientific study. Hence, the literature review for this study considered the major themes (entrepreneurial, cognitive, technological, and demographic factors) captured in the *Theoretical and Conceptual Framework* (see Figure 1). Secondly, a narrative approach was used to highlight concepts, debates, questions, and related theoretical models that inform the genealogy of themes covered in line with Babbie's (2010) and Hart's (2003) advice to interrogate existing intellectual works in a field critically. According to Hart, the purpose of the literature review is to provide context or gaps for the current study. This work's theoretical and empirical contributions are firmly grounded in career guidance and counselling practices, outlined in the final section of this chapter.

The first segment of this chapter examines the 'big-five' vocational theories and varied focal theories (goal-setting, self-efficacy, economic locus of control, need for achievement, and risky behaviours) guiding data collection, analysis and discussion.

These are followed by arguments on the scope, origin, and the quest to establish convergence for the entrepreneurship career terminology. The segment on entrepreneurship also reviews the extant literature on factors that define the entrepreneur's career, the types of entrepreneurship practices, the relationship between entrepreneurial traits development, vocational counselling implications, and the relevance for wealth creation. The study further examines technology integration literacy with Hall and Hord's (1987) stages of technology adoption relating to how universities use computers for instructional delivery with potential for entrepreneurial career development. The literature review also interrogates the critical theories of education and anti-colonial frameworks defining Indigenous knowledges and shares Peter Drucker's concept of a knowledge economy and its implications for youth careers. Above all, the thematic analysis approach helps the study to organise the literature for analysis with NVivo™ software (QSR International Pty Ltd, 2009) for easy identification and referencing. NVivo™ software resources such as *Internals* and *nodes* came in handy in the literature review circle for the present work with peer-reviewed journals, monographs, and softcopies of books uploaded, which makes it easier to access rich information on themes guiding the review.

2.1.1 Vocational Theories and Entrepreneurship

Some scholars believe that vocational psychology has significantly benefited from several theories in traditional fields of organisational design, management science, sociology, and anthropology (e.g. Kidd, 2006). Hence, an attempt was made to evaluate relevant career theories that informed data collection, results discussion, and conclusions about career decision-making and development. According to Leung (1995), many theories described as the 'big-five' originated from the USA career development literature. As recent as the big five career development theories seem, they

have profoundly impacted careerists' attempts to understand how individuals navigate their vocational choices. Holland's traits and factor theory, Schein's career anchor, Super's self-concept career theory, Gottfredson's (1981) theory of circumscription and compromise, and Lent, Brown, and Hackett's (2002) social cognitive career theory (SCCT) constitute the categorisation. Other career models, such as the system theory, are discussed in this section.

Holland's Traits and Factor Theory

The study also discusses the trait views of Holland (1997), Cattell (1966b), and other models (cognitive, affective, and conative traits domains) in the prediction of career choices and the establishment of the relationship between entrepreneurship and career theories. The current study's traits reviews cohere with Ackerman and Beier's (2003) belief that career choice space would benefit from common predictor constructs for fields such as entrepreneurship. The career choice literature is often dominated by commentaries on matching traits to careers with little empirical documentation on what works for different cultures (e.g. Sharf, 2012).

Traits scholars, including Holland (1997), who expanded on the classical works of Cattell's (1966b) personality categorisation, have championed the traditional approach to career choice. Initially, Holland (1959) settled on six themes called the RAISEC (realistic, artistic, investigative, social, enterprising, and conventional traits) - popularly referred to as the Hexagonal (six elements) model. The crust of his model is that vocational choices are primarily determined by the interaction of personality type and environments that are conducive to the use of careerists' abilities. Even though personality study is yet to achieve a global cultural fit, some career counsellors quickly link Holland's Hexagonal model to leadership and entrepreneurial career choices (Kemboi, Kindiki, & Misigo, 2016, p. 103). Assessment and summary of individuals'

career interests can be categorised into primary and secondary based on three-letter combinations from the model (e.g. *RIA*, *ASC*, etc.). Overwhelmingly, career development findings have established a strong association between personality and career choice (e.g. (Spokane, Meir, & Catalano, 2000; Onoyase & Onoyase, 2009).

Within the trait and factor theories of career choice, significant others employ reductionism (Ackerman & Beier, 2003) to define vocational interests into two dimensions - things/ideas and data/people (Prediger, 1982). However, the pervasive nature of traits needed for diverse jobs has led Carroll (1993) and Block (1995) to reject the reductionists' view of ability and personality traits in vocational choice study. According to Ackerman and Beier, such rejection favours the proposed 16 personality dimensions by Cattell (1966b) that have provided the basis for assessing vocational choices made by individuals over the years in the field of differential psychology. Per the foregoing on the traits approach to career studies, career counsellors seemed to face multiple evaluative schemes for vocational studies with cultural and theoretical implications in the face of ever-changing demographics for job entrants (Saxena et al., 2014). The entrepreneurship literature is no exception, with difficulty accepting fit-for-purpose models to assess what makes extant entrepreneurs (e.g. Kruger, Wang, & Wilke, 2007). Therefore, the current study disagrees with merely matching individuals to careers with outcome expectations and conducive environments without understanding critical contextual variables such as technology integration, ability to set goals, exercise internal locus of control, and risk-taking. Holland's (1997) advocacy for a 'perfect' environment for individuals to exhibit their talents, skills, abilities, and knowledge suggests that success might be difficult in turbulent times for employees. The current study sought to test robust models for predicting entrepreneurs' career choices in a mist of chaos; entrepreneurs become hungry for success (Bygrave & Hofer,

1991) instead of accepting dogmatic career views advanced by the traits and factor proponents.

Social Cognitive Career Theory (SCCT)

The leading authorities of the SCCT were Lent, Brown, and Hackett (2002), whose views on career development were grounded in Bandura's (1989) self-efficacy theory. In seminar works published in edited books, Lent (2005) outlines three iterative themes guiding individuals' careers under the SCCT; these are the (a) development of academic and vocational interest, (b) choice of educational and career choices, and (c) educational and career performance and stability. Drawing on self-efficacy, outcome expectations, and personal goals constructs, the SCCT has seen broader applications to career decision-making and educational satisfaction outcomes (Lent & Brown, 2006), with career self-efficacy playing a mediation role between individuals' backgrounds (e.g., age, sex, socioeconomic status, academic qualifications, ethicality, religion, etc.), interests, and outcome expectations. Elements of the theory hinge on personal inputs and contextual factors guiding career decision-making (Bishop & Bieschke, 1998). Widely published instruments are available for measuring the theory. For instance, Betz, Taylor, and Klein's (1996) 25-item career decision-making self-efficacy-short form (CDMS-SF) used a 5-point scale to measure individuals' self-efficacy and successful ability to complete responsibilities related to career decision-making. The career choices measured in the CDMS-SF contain five subscales of one's self-assessment, occupational information, goal selection, planning, and problem orientation with summated average scores computed with 0.87 Cronbach alpha reliability scores. Subsequently, Betz and Taylor (2001) reported 0.83 test-retest overall reliability scores at 6-month intervals for the CDMS-SF amongst Iranian Agricultural students; high internal consistency values are noted for the questionnaire.

Nolan, Bucker, Marzabadi, and Kuck (2008) highlighted contextual factors such as family structure and parental support as either a barrier or a support in adolescents' career decision-making. In the late 1960s, environmental theorists acknowledged the positive impacts that ecological factors, including home and schools, can play in career choice; it can limit individuals' freedom to career development (Ginzberg, Ginsburg, Axelrad, & Herma, 1966). Effects of personality attributes and self-efficacy beliefs on undergraduate Chinese students' vocational choices have been reported, with respondents predominantly choosing graduate studies as career decision-making (Jin, Watkins, & Yuen, 2009). Jin et al. concluded that undergraduates' lack of career development opportunities could contribute to their choice of postgraduate studies as a career choice. Ghanaian business curriculum requiring students' industrial experiences and attending career fairs might contradict Jin et al.'s views on why undergraduates select postgraduate studies. Maybe postgraduate studies offer a better vocational development plan for Chinese students, and the case in the Ghanaian economy might differ with students' desire for employment to supplement their families' income instead of pursuing postgraduate studies- a practical application of Lent's (2005) Social Cognitive Career Theory in vocational studies for the youth. Significantly, the SCCT advocates personal and contextual factors for individuals' career choices; Jin et al.'s (2009) study draws attention to career development preparations for adolescence.

Preceding studies on career intention students using the SCCT also highlighted the scope of career decision-making, including personality traits, social support, self-efficacy belief, and outcome expectations for students' career planning and exploration (Rogers, Creed, & Glendon (2008). Other SCCT studies with student samples include Korean Agricultural students' intention and career decision-making (Esters &

Knobloch), students' career decision-making (Paa, 2001), and significant association between self-efficacy beliefs and career intentions (Ochs & Roessler, 2004). Therefore, the current study's intent to develop a decision-making model to determine undergraduates' awareness of entrepreneurial career choices could complement the view on career development programmes for undergraduate students.

Ali, McWhirter, and Chronister (2005) also showed empirical studies indicating statistically positive associations between adolescents' socioeconomic status versus vocational/educational self-efficacy ($r = .24, p < .05$) and vocational/outcome expectation ($r = .22, p < .05$). Evidently, the SCCT has some acceptable applications to career youth development studies. Girls have also been reported to have difficulty making career choice decisions compared with their male counterparts, and their families have even made it more difficult for them when entering technical vocations (Ramlee & Norhazizi, 2009). Hence, studying students' demographic variables using multiple discriminant analysis (Section 3.8.0) could illuminate how respondents' economic background and entrepreneurial career development are shaped in the Ghanaian environment.

Schein's Career Anchor Theory

An outcome of serendipitous longitudinal studies of organisational culture in 15 years of psychological data with 44 participants, Schein's (1990b) career anchor theory offers the necessary foundation for internal career studies in vocational psychology (Derr & Briscoe, 2007). The premise for his theory was built on the assumption that organisational homogeneity was more a result of individuals fitting well in than its socialisation process (orientation) and opted for more supportive environments that account for educational and career choices for a harmonious professional planning fulfilling individual life (Flum & Blustein, 2000). According to Chapman (2006, p.

670), Schein used the concept of “*career anchor*” to describe employees’ skills, knowledge, abilities, talents, and values (SKAs) for vocational decision-making. In his earlier submissions, Schein (1975) conceived the metaphor of marine anchor to describe those SKAs and hypothesised that dissatisfied workers with perceived incongruent career anchors with their current working environments are likely to leave for suitable employers. Notably, one’s personality and career experiences help mould an individual’s career anchors (Leong, Rosenberg, & Chong, 2014).

Working with associates (Schein, 1980; Derr, 1980; DeLong, 1981; Schein, 1985), eight sub-dimensions of the career anchors were later developed with the popular Career Orientation Inventory (COI), including technical/functional, general managerial, autonomy/independence, security/stability, entrepreneurial/creativity, service/dedication, pure challenge, and lifestyle competencies. Different submissions on Schein’s (1985) COI indicators are seen in the vocational literature. For instance, Leong et al. (2014: 526) provided rather nine indicators, which are not different from the original eight traits. The lifestyle integration (focus on family work-life balance) indicator was the new addition to Leong et al.’s list. Whichever variations exist in the COI, Feldman and Bolino (1996) noted four contributions of the career anchor theory. First, individuals’ career choices are not conclusive throughout life; they can be modified based on emergent environmental challenges. Therefore, young people selecting careers should consider environmental-fit variables when entering jobs. Secondly, professionals select career paths within industries rather than specific jobs. Thirdly, career anchors might differ for job entrants, so that career paths could vary for individuals in the same industry. Finally, it has been observed that career anchors are likely to limit job entrants’ career choices. Significantly, empirical findings establish employee outcomes of organisational commitment, job satisfaction, job stability,

increased productivity, and low turnovers (Feldman & Bolino, 1996; Allison & Schreuder, 2000). The theory has been criticised as elitist, dominantly applicable to highly qualified employees, mid-career specialists (Brunch, 1998), neglecting manual careers, and least educated individuals (Leong, Rosenberg, & Chong, 2014).

According to vocational researchers, the COI scale is suitable for assessing job entrants' career speciality choices seen in the eight indicators (Beck & La Lopa, 2001) compared with career intention measures witnessed by traits and factor theories. Robertson (1998) and Brunch (1998) commented on Schein's (1985) use of a qualitative (interview) approach in constructing the COI indicators, which lack rigorous psychometric results (e.g. statistical reliability). Until recently, Leong, Rosenberg, and Chong (2014) used the Kaiser-Mayer-Okin sampling adequacy approach in factor analysis, yielding a .76-coefficient value with 41 COI items. Even though reliability indices are globally scanty in the literature, Leong, Rosenberg, and Chong (2014: 525) made anecdotal claims of cultural acceptability for the COI measures based on works in the USA (Beck & La Lopa, 2001), Israel (Danziger & Valency, 2006), and China (Wong, 2007). However, Africa's case of COI use is unaccounted for in the Western academy, and validation reports for its heterogeneous societies with turbulent business environments could highlight the cultural acceptability of the inventory. Leong et al. recommend statistical validation of the COI instrument to inspire confidence in its utilisation amongst career development practitioners and researchers.

Recent empirical work has established a low bivariate relationship between two of the career anchors: autonomy and entrepreneurial/creativity ($r = .27, p < .01$) and inversely between entrepreneurial/creativity and job tenure security ($r = -.18, p < .01$) (Beck & La Lopa, 2001). The two findings are significant for the current study in entrepreneurial career decision-making. Autonomy and creativity are essential

variables for entrepreneurs (Thompson, 2009). Remarkably, entrepreneurs are found to have resilience and might not settle for tenure jobs (Apospori, Papalexandris, & Galanaki, 2005), as seen in the inverse associated with Beck and La Lopa's study. The limitations (adults' midcareer decision-making, professional careers focus, and lack of culturally applicable validity results) inherent in the career anchor theory (e.g. (Feldman & Bolino, 1996), the current study attempts to limit further discussions on it to future longitudinal studies of Ghanaian job entrants in entrepreneurship career. Cultural validation and the development of psychometric properties of Schein's (1985) Career Orientation Inventory are also needed to inform Africa's case of work environments. However, the following section also examines the Self-Concept Theory for an acceptable vocational theory on entrepreneurial career choice in the Ghanaian context.

Super's Self-Concept Theory of Career Development

Among several career choice and development theories is the late 1960s self-concept theory (Super, 1969), which has seen widespread acceptance in the United States of America. Super postulates that individuals' career choices and developments are products of sophisticated interactions of personal constructs such as physical and mental growth, life exposure, and environmental conditions (social, cultural, and norms). Super proposes five continuous life stages (1990) – growth (estimated ages from 14 to 24), exploration, establishment, maintenance, and disengagement (retirement age) - and each stage comes with vocational activities socially expected of individuals and have to be managed for successful life at each chronological age. Proponents of the self-concept theory suggest that adolescents have to cope with the vocational developmental stage referred to as *crystallisation*, which is a cognitive process of understanding a youth's interests, skills, and values that can be matched with desirable career goals. Like social cognitive career models, others believe that Super's

ideology is knitted with social context, the individual, and the environment (Savickas, 2002). Though the theory has received international recognition, sociologists warned that cultural variations might exist in interpreting the self-concept. Therefore, applying Super's theory on career development could be significant for studying students' entrepreneurial career decision-making in Ghanaian business faculties.

Gottfredson's (1981) Theory of Circumscription and Compromise

The last category of the 'big-five' theories on children's career development emerged from a sociological perspective called Gottfredson's theory of circumscription and compromise (Helwig, 2001, p. 78). Her theory presents developmental stages as early as 3 to 5 years (Stage 1) to approximately 14 years (Stage 4), with kids developing self-awareness of social gender roles parental and significant other family members' roles in their lives about career interests (Gottfredson, 1981). For instance, early vocational interest studies amongst kindergarten children established that mothers' careers profoundly interested them more than their fathers. Significant for this theory is the increasing impact of occupations' social values as children consider vocational choices from the second to the third stages. However, studies have revealed that gender has no significant perceived value for children's career decision-making between nine and about 14 years of age, Gottfredson reported. The theory of circumscription and compromise presents a helpful approach to early career studies for children and a model for career development experts for early career coaching (Cook & Simbayi, 1998); it probably fails to account for youth career trajectories in black cultures. Also, Helwig's (2001) conclusion, based on Caucasian participants from Denver, USA, is that most students tend to be on appropriate career paths that lack generalisation.

2.1.2 Socio-Cultural Factors Predicting Entrepreneurship Career

Despite the inconclusive nature of the debates on whether entrepreneurs are

made or born, predictive science offers academics the unique opportunity to determine requisite traits for predicting individuals' careers based on the dictates of their social environments. Certain assumptions are made about the influences of social and cultural forces on individuals to see qualitative improvement in their lives. For instance, others argued that individuals often search for ideal environments that will enable them to express their skills, knowledge, abilities, attitudes, values, and emotions to grow. Some also predict that a person's conduct is because of interactions between his or her personality and the social environment. These beliefs bring to mind counsellors' role in exploring learners' environment before helping them make career choices and develop their career aspirations. Perhaps it would be worth interrogating how Ghanaian cultural practices will likely influence students' entrepreneurship career aspirations using categorical variables and five metric factors (self-efficacy, need for achievement, locus of control, risk-taking propensity, and goal-setting).

Some authors believe that the rich role of context is understudied and have encouraged researchers to address this gap (Doucerain, Dere, & Ryder, 2013). Undoubtedly, the classical works of Vygotsky's cultural-historical theory are relevant to modern behavioural analysts within a social context. A historical account by a Soviet historian of psychology, Yaroshevsky (1989), has it that Vygotsky himself refers to the theory as "cultural-historical" with predictive factors such as historical developments and culture as the aggregate of one's psychical world. In recent views, Jovanovic (2015, p. 11) considers Vygotsky's theory as attributes referring "primarily to his approach to psychic development, which claims that cultural and historical conditions are formative in the structuring and functioning of psychic processes." Even though several flavours of Vygotsky's theory continue to emerge, with others even questioning Yaroshevsky's reference to describing the theory as cultural-historical, Jovanovic was dismissive of

labels arguments and upholds the fulcrum of Vygotsky's hypothesis (social, cultural and historical) as relevant today than ever. However, Bierwiazzonek and Waldzus (2016) intimated that a high degree of specialisation exists in the 'adaptation' literature, with a field such as differential psychology tapping into it to support arguments for matching personalities to jobs and career development.

Correspondingly, applications of Vygotsky's theory can be seen in the works of career development experts who attempt to understand how individuals adapt to their learning environments with job characteristics that set them apart. For instance, others have extensively explored the sociocultural environment in schools and submitted that it plays an essential role in students' motivation (Eccles & Wigfield, 2002; Pintrich & Schunk, 2002). In a recent study, Kahraman and Sungur-Vural (2014) examined students' views concerning their school instructors and parents' reasons for educating them from a socio-cultural view. They established that socio-economic status and socio-cultural influence in linear combinations significantly accounted for 21% variance errors in task value in learning science. Strategically, the entrepreneurship field has seen several studies drawn on social network analysis to explain entrepreneurs' access to resources (e.g. Casson & Della Giusta, 2007; Bowey & Easton, 2007). Consequently, this segment examines the related literature on entrepreneurship typologies with socio-cultural theory as background theory.

Some argued that entrepreneurship focuses on newness and novelty in new products, processes, and markets as the drivers of wealth creation (Daily, McDougall, Covin, & Dalton, 2002; Smith & Di Gregorio, 2002). The broad definitions offered for entrepreneurship have witnessed its applications in various industries and socio-cultural contexts with incredible outcomes. Therefore, this segment extends the discussion to some popular industries where entrepreneurship principles and theories hold. Using

content and thematic analysis with NVivo software (QSR International Pty Ltd, 2009), different types of entrepreneurs emerged from the extant literature. In no special order, academic entrepreneurship writers show that universities have assumed prominent position and are catalysts for economic and social change with their natural incubator roles for creative ideas generation, technological newness, and different resources suitable for competitive advantage (Dasgupta & David, 1994; Kirby, 2002). Citing the impact of today's knowledge economy, academic entrepreneurship is said to occur within the scientific and scholarly backgrounds of intellectualism. Because of becoming competitive, universities have become more entrepreneurial for more productive and innovative links between education and research (Kirby, 2006). The impact of Vygotsky's socio-cultural factors can be applied to predicting academic entrepreneurs. For instance, quality teaching and learning facilities, educational and administrative scholarship, congenial learning environment, work culture, and human resource strategies driven by growth models could all be relevant factors to watch out for to promote academic entrepreneurship.

Indeed, Guerrero and Urbano (2012) recommend universities offer new alternatives that link theory to practice with the involvement of local communities as a form of entrepreneurial gesture. Despite Urbano and Guerrero's lamentation on the fragmented and disarrayed nature of the literature on academic entrepreneurship, they also hinted that the phenomenon has received increased interest from academics, government, and policymakers seeking to promote it within the technological developments altering the educational processes over the past decades. This privileged position of academic entrepreneurs could probably be realised with information and communication technology, as pointed out by Urbano and Guerrero. Nevertheless, within Ghanaian universities, promoting academic entrepreneurship could be

challenged by the finding that some teacher universities still occupy low technology integration literacy positions amid fast-expanding technology in education (Yidana, 2007). In addition, the Internet has altered the educational setting dramatically with online learning, effective instructional design practices, and enhanced research scholarship using ICTs. However, Yidana pointed out that only a few faculty members were progressing with ICTs for teaching and learning in Ghanaian universities.

Another entrepreneurship typology in the literature linked to socio-cultural theory includes health promotion. Social, political, legislation, and instructional technology advances are precursors to health entrepreneurship (Eddy & Stellefson, 2009, p. 333). Health promotion protocols in designing, implementing, and evaluating disease prevention have also been linked with entrepreneurship, marketing management, and other business activities (Eddy, 2006). Similarly, Eddy and Stellefson suggested the business and health education applications, formative evaluation, needs assessments, and other data-gathering methodologies to develop two-way circular communication channels that determine the values, needs, and preferences of customers (in business applications) and students, clients, or participants.

Other notable fields that have seen entrepreneurial postures are marketing (O’Cass & Sok, 2014; Lam & Harker, 2015), and the political processes of policymakers can be considered entrepreneurial (Ireland & Webb, 2007, p. 909). Political entrepreneurs are individuals desirous of obtaining a political position at institutional and state levels (Giménez-Roche, 2011, p. 178). Another interesting perspective on political entrepreneurship, in the form of policy management, is reported in the literature. Mintrom (1997) believes that policy entrepreneurs act in the political space to identify and help define problems and then seek to modify policy through consensus-building initiatives. Similarly, Schneider and Teske (1992) extended the

works of policy entrepreneurs as their actions could significantly alter government politics within a larger social environment. Today's increasing and competitive political activities on Ghanaian university campuses could be a great source of political and policy entrepreneurship for students. Hence, institutional identities are worth examining in the current study.

Finally, social entrepreneurship is closely linked with political and policy entrepreneurship. Indeed, social entrepreneurship has received extensive coverage in the entrepreneurship documentation (Chell, 2007; Giménez-Roche, 2011; & Caldwell, Harris, & Renko, 2012). Underlying the diverse definitions of social entrepreneurship is the impetus to create social value instead of exquisite attention to profit maximisation (Austin, Stevenson, & Wei-Skillern, 2006). Caldwell et al. note that despite social entrepreneurs' potential to be an empowering source of job creation and social innovators, they also have the unfortunate conduit to further disenfranchise social minorities in a population (p. 505). Perhaps Caldwell's concern is grounded in the world's most impoverished societies where entrepreneurial ventures could find space in health, sanitation, STD awareness creation, and education. However, Kate Caldwell and her cohorts suggested that communities exercise restraint from the oppression of the vulnerable and already marginalised.

2.1.3 Guidance and Counselling Roles in Entrepreneurship

The historical literature on achieving academic status is emphatic that psychologists are in a pole position for entrepreneurship research and commentary (e.g. Begley & Boyd, 1987; Simon, Houghton, & Aquino, 1999) with economics and management as pioneers (Schumpeter, 1934; Shane & Venkataraman, 2000). In furtherance of the historical literature, significant others fervently opposed the traits approach (Kirzner, 1997; Gartner, 1988). Nevertheless, using self-report instruments,

the traits models are still preferred by behavioural scientists who focus on individuals (psychology) or social hegemony (sociology) with the argument that such traits offer in-depth perspectives to understanding entrepreneurs' attributes (Lentz & Laband, 1990; Badal, 2010; Hout & Rosen, 2000). Reacting to the opposition to trait models, this study believes that the argument for or against has to be positioned within Vygotsky's socio-cultural context with the heterogeneity of nations' cultures. However, historical accounts by entrepreneurship biographers cannot categorize which sub-fields of psychology contributed the most. Consequently, the current segment seeks to adopt an interdisciplinary approach to connect guidance and counselling curriculum to entrepreneurship traits development under the umbrella of vocational interest assessment.

Such convergence is based on the assumption that counsellors play significant roles in helping people engage with their anxieties and apply diverse interventions ranging from behaviourism, cognitivism, and psychoanalysis to help clients resolve their problems (Sharf, 2012). Indeed, as career counsellors seek modern approaches to meet millennials' job needs (Tractenberg et al., 2002; Sullivan & Arthur, 2006; Inkson, 2007), they could equally apply entrepreneurship research to build client's capacity for future vocations. According to Ackerman and Beier (2003, p. 207), such assumptions are premised on job occupants in some vocations who tend to share constellations of interests that can be differentiated from jobholders in other fields. Thus, interest in counselling job occupants (existing and prospective) based on personality, interests, and culture is the fulcrum of vocational counselling (Holland, 1997; Prediger, 1982). Connecting the pivotal role of counsellors to identifying the career interests of clients cannot be delinked from trait approaches to predict entrepreneurs (Aldrich & Zimmer, 1986; Bull & Willard, 1993; Geldhof et al., 2014). For example, career experts' works

such as Osipow's (1973) career development theories, vocational choice theory (Holland, 1959), as well as Betz and Hackett's (1986) application of self-efficacy theory predicting career choice behaviour all have relevance to entrepreneurship studies. Citing Bygrave (1989a), who suggested deploying observations and longitudinal approaches (advocacy for constructivism) for entrepreneurship theory development, the counselling field can significantly contribute by synthesising client cases. Data from vocational counselling individual and group therapeutic practices can be helpful to entrepreneurship scholars in predicting entrepreneurs' attributes. Vocational counsellors' focus on matching job occupants to appropriate careers might benefit from theories and constructs in the entrepreneurship field. Indeed, an extensive theoretical network of constructs is the backbone for vocational counselling that can benefit entrepreneurship education across cultures.

Whilst the foregoing sections on related literature thus far outlined the tenants of entrepreneurship development within technology and cognitive variates, the current section positions the entire study within the field of career development practices in psychology's subfield of guidance and counselling. Because they help learners make informed decisions about their future careers, counsellors in business or schools often attempt to guide individuals toward anxiety-free careers. Consequently, the study examines career and programme choices students face in the 21st century and argues that guidance and counsellors have important obligations towards developing their students' entrepreneurial competencies. Career development presents counsellors with a unique field of specialisation in helping individuals build sustainable vocations or jobs that match their skills, knowledge, and abilities – trait approach. Similarly, Patton and McMahon (2014, p. 7) refer to career development as a lifelong process of getting ready to select and continuously make choices from many job roles available in society.

2.1.4 Focal Theories Underpinning the Study

Given cultural-fit deficits in foreign dominant theories of career choice studies (Leung, 1995), the present research laced evaluations of career development theories with indigenous Ghanaian knowledge systems using pilot studies of focal theories underpinning data collection and analysis of entrepreneurial career choice (Section 3.4.0). Consequently, the current section examines five social-cognitive (self-efficacy, goal-setting, locus of control, need for achievement, and risky behaviours) in Ghanaian public universities.

However, social cognition shares similarities with Lent, Brown, & Hackett's (1994) social cognitive career theory and Holland's (1987) traits and factor model. The current study extends the frontiers of vocational guidance to test the impact of entrepreneurial career choices in modern psychology models. It is against the backdrop that many vocational theories addressing career choices are predominantly limited to homogenous Caucasian cultures to the detriment of Africa's heterogeneous groupings. Hence, the current study intends to employ social-cognitive domains to predict students' entrepreneurial career portfolios, which would also address ecological validity issues in vocational psychology for Ghanaian public university students. The primary and supplementary hypotheses in this study offer such combinations of variables for empirically testing traits, as Snow (1963) suggested.

Perhaps making sense of the academic world often depends on adhering to an established tradition called theory. Indeed, theories provide a guiding framework for contextualising the phenomenon of interest in intellectual discourse analysis and place theses within a historical tradition (Hart, 2003). Defining theory, Kerlinger (1973, p. 9) states that it is "a set of interrelated constructs (concepts), definitions, and propositions that present a systematic view of phenomena by specifying relations among variables

to explain and predict the phenomena.” Others also explain that theories are “proposed explanations for the causes of the phenomenon, and they vary in scope and level of explanation” (Shaughnessy et al., 2012, p. 49). Maxwell and Mittapalli (2008, pp. 876-877) shared three characteristics of theory: (i) abstraction that often refers to constructs or ideas that are hypothesised or inferred rather than being overt; (ii) general and apply to multiple cases as well; and (iii) self-explanatory and goes beyond the description of a phenomenon. Theories help to explain, predict, and evaluate human behaviour from macro (larger society) or micro (individual and unit) perspectives in the field of social sciences (Stake, 2010). On the role of theory in the research process, Anfara, Jr. (2008: 872) admits theory's uniqueness in focusing on research, revealing and concealing meanings, showing strengths and weaknesses of a study, and positioning a thesis in a scholarly conversation. Such suppositions help researchers to explain their constructs within the social environment.

Phillips and Pugh (2005: 56) made a compelling argument that bureaucratic and administrative variations exist between different academic fields and universities regarding the form and structure of thesis due to high demands on student-researchers to exhibit high degree of evaluative knowledge in their fields as well as conform to certain in-house styles. Nonetheless, they advocate three analytical forms of presentations that run throughout the thesis without necessarily being labelled as such; instead, they are covered in the entire writing. These are background theory, focal theory, and data theory. Instructively, Philips and Pugh contend that background theory covers broad issues on history, debates, and emerging trends in one's academic field. The student's constructs are comprehensively covered under focal theories. Phillips and Pugh's prescriptions on heterogeneous theories use informed career choice models, social-cognitivism, concern-based adoption models, diffusion of innovation

(technology), and theory of planned behaviour (entrepreneurship intentions) tested under the Research Question 1 (*what relationships exist between cognitive, technological, entrepreneurship intention levels and demographic variables (collectively and individually) for Ghanaian business graduates?*). Background theories emerging from students' narrative data (Research Question 2) were also covered. The views expressed by the discussants in the current study's FGDs seemed heavily leaned toward (Section 4.2.0) postmodernism theories (feminism, education, and postcolonial frameworks). Anfara, jr. (2008) prompts researchers of some inherent weaknesses that no one theory can adequately describe, explain, or predict any event, and the tendencies of a theory to be too reductionist, deterministic, denying the phenomenon of its complexity, and other interesting subjective elements in an attempt to offer thick descriptions. Paraphrasing other academics on the weaknesses and strengths of theories' attempt to force researchers to 'fit' data into predetermined categories, Anfara, jr. justifies the ground to employ a multiplicity of frameworks in one study. Anfara, Jr.'s view on different theories in one research also finds expression in Jains' (2011) recent proposition that entrepreneurship academe adopts multivariate approaches that allow many variables to predict entrepreneurs' characteristics. Also, the use of several theories in one research could help objectivists' ontology and epistemology on realism that often seeks to account for a large percentage of variance and power in human behaviour (Field, 2009); therefore, the choice of several theories proposed in *The Conceptual Framework* guiding this study (see Figure 1).

2.1.5 Social-Cognition and Entrepreneurial Career Choice

The social-cognitive frameworks of Albert Bandura (Self-Efficacy), Rotter (Locus of Control), McClelland (Need for Achievement), Locke and Latham (Goal-Setting), and Kruger et al. (situated rationality theory) set the tone for the current focal

theoretical review. Social cognitivism is an umbrella term in psychology and a scientific study of episteme within the social milieu one finds oneself (Reisberg, 2010, p. 4). Scott (2006:36) historically submits that studying individual actions without situating them within robust cultural systems could be dangerous for behavioural scientists. Scott also emphasised the evolutionary nature of cultural systems from society and national levels with multiple subjectivities that could be studied in unique ways based on the classical arguments of Wilhelm Dilthey (1883-1910) that the social sciences often revolve around the desire to ‘understand’ cultural wholes to follow their fields’ evolutions. The cognitive approach projects certain types of entrepreneurs’ behaviour success in business, defines entrepreneurs, and attempts to distinguish them from non-entrepreneurs (Sánchez, Carballo, & Gutiérrez, 2011, p. 433). The dominant consideration of cognitive-based approaches focuses on individuals’ beliefs, value systems, and mental processes, as Reisberg (2010) illustrated. Indeed, cognitive science emerged in opposition to the stimulus-response approach to studying human behaviour (Reed, 2007). In the same vein, entrepreneurial researchers opting for cognitive theoretical models often articulate their opposition to trait-based views (e.g. Kirzner, 1997; Sánchez et al., 2011). However, the debate emphasising the role of cognition in the success stories of entrepreneurs also recognises environmental determinism and believes that stimuli from the cultural context might influence individuals’ thought processes (Mitchell et al., 2002). Therefore, psychologists interpret human behaviour and mental processes within specific environments (Mather, Cacioppo, & Kanwisher, 2013, p. 108). However, it could be misleading to interpret youth behaviour about entrepreneurship across cultures using a universal theory without considering ecological validation. Hence, this study recognises such pitfalls in theory application by factor analysing social-cognitive theories in the data collection and interpretation for

contextualising the dominant factors explaining business students' entrepreneurial propensity (Sections 3.4.1 to 3.4.6).

Prominent theories on how human knowledge works concerning one phenomenon or the other have dominated entrepreneurship literature (e.g. Busenitz., et al., 2003; Spencer et al., 2008; Sospeter et al., 2014). However, the current study used self-efficacy (Bandura, 1989), need for achievement (McClelland, 1961), goal-setting (Locke & Latham, 1990), internal locus of control (Rotter, 1966), risky behaviours (Susten, 2008), and the Theory of Planned Behaviour (Ajzen, 1991) as constituents of cognition to explore the two research questions (Section 1.4). The current study adopts the cognitivism model to explain students' entrepreneurship traits within the complex nodes of human thinking and information processing offered by cognitive psychologists (Reed, 2007; Reisberg, 2010; Sweller, Ayres, & Kalyuga, 2011). Indeed, higher-order thinking is one preferred skill required of twenty-first-century graduates (Burkhardt et al., 2003) in the knowledge society. Sánchez et al. (2011) recognise the contribution of cognitive psychology to the academic study of entrepreneurship. Hence, accessing 21st-century scholars' ability to exercise their mental faculties in taking personal responsibilities for their lives and encourage innovative thinking is a departure from the criticised (Schumpeter, 1934; Gartner, 1988) traits approach in entrepreneurship research. Therefore, this section discusses the elements of five cognitive theories outlined in this study and offers justifications for their deployment in explaining the experimental effect of entrepreneurship propensity.

Hobbis and Sutton (2005: 9) postulate that cognitive frameworks are characterised by individuals' ability to process incoming information using core beliefs, assumptions, and automatic switching with psychological complexities. Peter Drucker (2005) is correct about restructuring nations' economies to account for innovative

entrepreneurship, given the sophisticated high-speed technologies employees must use daily. Such a foundation provides a logical basis for the current study's cognitive-based frameworks to account for graduate unemployment with entrepreneurship as an intervening construct.

Consequently, the current study adopts different concern-based adoption models and diffusion of innovation models to investigate students' preparedness to create jobs using their mental capabilities and technology integration literacy required of today's knowledge society.

2.1.6 Self-Efficacy Theory

Dominant amongst cognitive-based theories is Albert Bandura's self-efficacy theory, which often receives extensive application in entrepreneurship research (Sánchez et al., 2011). Grounded in social-cognitive theory, the dominant feature of self-efficacy has led others to suggest that it is one of the most researched topics in the fields of education and psychology (Celik, 2015: 106) and preferably, the most popular form of expectancy belief in the applied psychology writings (Vancouver, Moore, & Yoder, 2008: 36). Bandura's (1994: 72) recent definition of self-efficacy highlights individuals' beliefs in their capabilities to execute "certain level of performance or desired outcomes" that influence situations and affect their lives. Similarly, Chen, Greene, and Crick (1998) added that the entrepreneurship self-efficacy construct accounts for individuals' self-belief in their ability to engage in roles and execute entrepreneurial activities diligently. Subsequently, Bandura (1989) also explains how positive or negative self-efficacy beliefs generally enhance or undermine individuals' performance and motivation to undertake a challenge. Recently, Bandura (2004) acknowledged how social persuasion contributes to the formulation of self-efficacy theory. In any context, people's beliefs affect their choices, actions, efforts, resilience

in the event of obstacles, and how much stress and anxiety they will experience” (Mackenzie & Peragine, 2003, p. 291).

Others show that low scores on the self-efficacy scale relate to an inability to spot entrepreneurship opportunities (Vecchio, 2003; Lucas & Cooper, 2005). Similarly, Vecchio established that high scorers are found to have exhibited a high percentage of variance in their ability to overcome perceived obstacles and anticipation of more positive results. An interesting side of low self-efficacy proposes that motivation to learn novel skills or subjects is related (Chichekian, Shore, & Tabatabai, 2016, p. 3).

Understanding sources of students’ self-efficacy beliefs could also be profound in the school environment. Ayres (2005) finds out that students with high self-efficacy beliefs regarding their ability to acquire new skills before they commence leadership development training are more likely to transfer learning to the workplace after completion of training. Others also report that peers (Hoy & Spero, 2005; Bicego, 2006) and faculty feedback (Lord, 2010) are crucial. Nevertheless, most of the empirical research on sources of self-efficacy has been targeted at high school and college-aged students in predominantly Westernised environments (Usher, 2009, p. 276).

Contextual and demographic variables have also been found to influence self-efficacy development. Thus, gender, ethnicity, and learning domains (Lent, Brown, Gover, & Nijjer, 1996; Britner & Pajares, 2006; Pajares, Johnson, & Usher, 2007) are cited as essential influences on self-efficacy. Incidentally, Kelly, Ali, Brush, and Corbett (2012) report differences in gender and entrepreneurship, with men being more likely to assume risk and recognise opportunities than their female counterparts. In a similar regard, others revealed that self-efficacy beliefs are relevant predictors of a person’s attempt with a business behaviour, such as launching a new enterprise and perseverance at a task when faced with challenges (Austin & Nauta, 2016) and

individual's career choices (Lent, Brown, and Hackett, 1994).

User (2007: 276) also reports in her article that Bandura's findings support "mastery experience as the most influential source" of efficacy beliefs, with the predictive value of the other sources inconsistent due to the likelihood of methodological weaknesses. High levels of self-efficacy are associated with individuals' belief that they possess the skills or qualities to manoeuvre certain situations (Wise, 2007) successfully. Empirical evidence also suggests that relationships exist between social networks and efficacious beliefs regarding an individual's access to information and peer support (Daly, Moolenaar, Bolivar, & Burke, 2010). Consequently, understanding how students develop general self-efficacy could immensely help career counsellors with entrepreneurship interests. On the suggestion of measuring self-efficacy, Bandura (2001) recently highlighted the need to design inventories to measure particular domains of functioning. Academic literature has shown various types of self-efficacy, including medication self-efficacy, sexual self-efficacy, and academic self-efficacy (C, elik, 2015).

Therefore, the overarching goal of this study is to explore business students' *general task self-efficacy* with entrepreneurship propensity. Students' beliefs in their capabilities to accomplish tasks from the locus of general task self-efficacy were measured in this study. Indeed, the current research coheres with Teo and Kam's (2014) multivariate models to assess the initial 20 general self-efficacy scale (GSES) for its cultural validity. Jerusalem and Schwarzer (1981) originally developed the GSES in German as a 20-item scale. However, Teo and Kam maintained that cultural factors are essential in reporting the GSES, with only 10 items retained in the final instrument. Similarly, the current study retained 13 items following exploratory and confirmatory factor analysis to account for cultural validity (Section 3.4.4). In sum, the 13 retained

items made it for this study's principal analysis of Research Question 1.

2.1.7 Entrepreneurship Thinking with Need for Achievement

The Need for Achievement (nAch) theory is defined as fundamental motives directing individuals to mobilize internal and external resources to face challenges for personal success and excellence on tasks (Atkinson, 1958; McClelland, 1961). Using a multivariate technique in a later work, Elizur (1986) discovers two dominant themes that explain the nAch construct. Resource type (internal or external) and time perspective relative to task performance (before, during, or after performance). Sagie (2002) further provides practical applications of Elizur's two facets of internal or external resources when a person confronts a challenge in life. However, internal resources represent an individual's inner energy or orientation that involves efforts, responsibility, and avoidance or tolerance of favourable and unfavourable events instead of accepting easy duties in life. Invariably, Sagie also says that external resources are "instrumental means" that might include answers, approaches, and estimations in those situations requiring problem-solving, decision-making, or risk calculations. From the definitions of the founding fathers (Atkinson & McClelland) and Elizur's examples, the dominant theme underlying the nAch construct stems from an individual's ability to exercise their mental traits in decision-making regarding life's successes. Locke & Latham (1990) state that individuals with high nAch tend to believe they have reliable feedback about progress towards their objectives in life.

In the applications of the nAch theory, Matthews and Dagher (2007) confidently suggest that intentions of achieving goals are crucial variables for entrepreneurship success. The bottom line is that the nAch factor is success-driven, combining one's inner core and careful applications of environmental resources for personal growth. Similarly, significant relationships exist between nAch and entrepreneurship construct

across several studies (e.g. Venkatapathy, 1984; Johnson, 1990). Hence, the current study seeks to examine the relevance of nAch to predicting Ghanaian students' desire to create jobs after school in the wake of entrepreneurship researchers' concern about the desire to understand the dwindling numbers of individuals willing to start businesses with only a few who achieve their dreams, and even fewer survivors (Timmons, 1992). Others attempt to explain such business failures as a lack of persistence spirit (Bird, 1988; McDaniel & Sharpe, 2002). According to Matthews and Dagher (2007: 931), McClelland's (1961) original achievement theory could be used to explain entrepreneurial persistence. Others have established the relationship between diverse entrepreneurial activities, dispositions, and intentions (Koh, 1996; Shaver & Scott, 1991). The underlying theme of McClelland's theory is traced to fulfilling expectations based on personally defined standards of excellence for the individual (Loon & Gian, 2008).

Cross-cultural findings of achievement motivation of successful entrepreneurs have been reported in the USA (Stewart et al., 1999) and the UAE (Apospori et al., 2005). Such findings indicate that links exist between entrepreneurship and the nAch factor. Consequently, McClelland's (1961) need for achievement theory forms the basis of understanding students' preparedness to undertake entrepreneurship activities as they leave universities in this study. Interestingly, evidence also shows that one's cultural environment predicts individuals' achievement motivation and behavioural manifestations (McClelland, 1986; Sagie, 2002). Hence, entrepreneurship theorists continue to explore several ways the nAch theory could be relevant to new business formation. Undoubtedly, personality traits of nAch and persistence continue to fuel competitive achievement of firms' excellence (McClelland, 1965), endear entrepreneurs with greater control over their attitudes (McClelland, 1961), and as a

predominant consideration in growth and the later success stories of a budding business (Stewart & Roth, 2007). Thus, people's views about their environment and opportunities might be essential in fostering a nAch drive for young entrepreneurs—individuals' awareness of their environments with decision-making positions in the nAch theory within the social-cognitive framework.

Therefore, the choice of the nAch factor centres on the desire to deconstruct emerging entrepreneurs' (youth) interest in job creation from diverse cultures and as an engine for entrepreneurship creation (Carsrud, Jennie, & Kristie, 2009). Also, Sagie and Koslowsky (1998) explain the variance in the diversity of the nAch theory as due to cultural issues, national values, history, tradition, socialisation processes, and religion. In their earlier submissions, Erez and Earley (1993) noted that culture influences the cognitive schema, which ascribes meaning and values to motivational variables and guides choices, commitments, and standards of behaviour in society. Extending the cultural argument for the nAch theory, Hofstede (1980: p. 25) defines culture as “the collective programming of the mind which distinguishes the members of one human group from another . . . [and] includes systems of values.” Twumasi (1975, p. 7) also describes culture as individuals' ideals, chieftaincy hierarchy, sociological norms, systems of power, authority roles, and family orientations that are profoundly nested within Ghanaian society.

Others discovered individualistic (e.g., USA) and collectivist (e.g. India and Japan) ideologies as essential variables in understanding peoples' desire to be successful (Hofstede, 1980). Undoubtedly, the role of cultural influences on the collective perspectives of the Ghanaian student, as well as the implications for the nAch traits, could also be positioned within a collective culture. With a critical sociological lens, Twumasi (1975) emphasises that the social actions of Ghanaians laced with their

proverbs and often interpreted by the head of lineage within the ancestral settings might be a consideration for understanding youths' ownership of their thought processes and assuming independence of their lives within the shared cultural system like Ghana. Strikingly, others proposed that nAch theory instead favours individualistic cultures over collective cultures within a hypothesized framework of people who view achievement as personal success and excellence tend to set higher private goals than those from collective cultures (Triandis, Bontempo, Villareal, Asai, & Lucca, 1988). Notwithstanding, nAch is suggested to hamper collective efforts of group entrepreneurship (Khan, Breitenecker, & Schwarz, 2015, p. 77). Significant to the current study is the debate of cultural roles and nAch motivation in entrepreneurship propensity within the thinking of Twumasi (description of Ghanaian culture) and Hofstede's elaborate work on collectivist cultures. Hofstede further explains that individuals from collectivistic cultures share certain extended families or clans' values and norms in implicit exchange for group membership, loyalty, and identity. Such cultures adhere to concepts of belonging at the expense of personal initiatives, with deviance in opinions "typically punished" (p. 235).

Despite the enormous interest generated by the nAch theory amongst entrepreneurship researchers, some questioned the relationship between motivation and entrepreneurship activities (Ryan, Tipu, & Zeffane, 2011, p. 154), a sharp contradiction to Apospori et al. (2005) and Stewart, Watson, Carland, and Carland (1999) earlier views on the same subject that highlighted entrepreneurship researchers' lack of consensus on motivation and nAch. Ryan et al. further questioned the empirical relationships between entrepreneurship potential and nAch based on regional, gender, and national group contexts since the nAch theory is dominated by Western views. Hence, the present study contends that findings about potential student entrepreneurs'

motives could lend credence to the theoretical generalisation of the nAch.

In the process of identifying a theoretical gap for their study, the debate of research generalisation has seen others' criticism of statistical-based generalisation, whilst some contend that theoretical applications of research findings should also be an "alternative" to results interpretation and analysis (Lee & Baskerville, 2003, p. 228). Hence, the interpretation of findings from the current study should consider the Ghanaian cultural values, norms, and demographic characteristics of the sample, which had an average age of 24 (Figure 2). In summary, the current study also accounted for the cultural diversity of McClelland's (1961) theory of nAch within the Ghanaian culture towards ecological validation of the theory with six questionnaire items significantly loaded on *Factor 5* (see Section 3.5.5).

2.1.8 Economic Locus of Control and Entrepreneurship

In the views of developmental psychologists, several human attitudes and behaviours are learnable through parental teachings and observations from significant other family members' socialisation at infant stages, referred to as environmental determinism (Shaffer & Kipp, 2007, p. 55). Therefore, Hayes (2006, p. 1) believes that the child's ability to learn family financial practices could be possible. In the views of Hayes, whilst teenage pregnancy, drugs, and sex have dominated the American social discourse, societies continually regard the discussion of money amongst the youth as prohibitive and delayed way into adulthood. Fuelled by the pervasive culture of credit, some American college graduates leave school with excessive borrowing due to a lack of poor economic perception (Norvilitis, Szablicki, & Wilson, 2003; Hayhoe, Leach, Allen, & Edwards, 2005). Individuals' borrowing attitudes could be linked with cognitive constructs such as locus of control. In this light, the present study attempts to explain students' entrepreneurship attitudes using Julian Rotter's locus of control

theory in the Ghanaian context.

Originally, the locus of control (LOC) theory has been attributed to Rotter in a classic monograph, where he states that personalities who believe they can control events affect them possess LOC (Rotter, 1966). Following the first seminar work by Rotter from his grounded theory that propounded the locus of control theory, over 600 publications on the construct continue to generate various conceptualisations (Kormanik & Rocco, 2009, p. 468) rather than achieving parsimonious definitions. Others continue to express their worries about the inconsistencies in LOC results from scientific studies (Lachman, 1986), with many more researchers advocating for domain-specific LOC scales instead of general concept definitions (Lefcourt, 1991; Spector, 1982). Rotter (1975) later suggested domain-specific measures of the LOC factor because the general applications of its scales tend to produce weak predictions with theoretical generalisability (Fournier & Jeanrie, 1999). Millar and Shevlin (2007, p. 226) provide enough evidence of the increasing number of scientific studies using Rotter's internal-external locus of control scale. On the categories of LOC, Fournier and Jeanrie identified seven areas (decision-making, self-knowledge, meaning of work, career planning, social and work environment, educational institutions, and job market) of career choices relating to LOC measures on specific domains. Testing such assumption in the Ghanaian context with graduating business students from Ghanaian public universities could also provide some form of cultural and ecological validation to Rotter's (1966) LOC scale.

Similarly, Rotter's (1966) locus of control theory is premised on a larger framework of social-cognitive thinking (Senler, 2016). The views of the social-cognitive thinkers include individuals' ability to make informed decisions about the cultural and social environments. Therefore, students' use of the LOC theory in

entrepreneurship thinking could have implications for cultural values and other social contexts in which Ghanaian students operate. According to Kormanik and Rocco (2009), the LOC construct has wide applications in human sciences and clinical trials. Decades earlier, others such as Janssen and Carton (1999) have defined LOC as a personality construct that addresses an individual's generalised expectancies that they can or cannot control reinforcements in their lives; hence, their experiences are purely as predicted by chance, fate or significant others. Similarly, others also view Internal LOC as referring to individuals who hold expectancies that they control reinforcements (Jennings & Zeithaml, 1983), and people who lack control of reinforcement are described as externals (Sunbul, 2003, p. 57). As Vickers et al. (1983) aptly put it, internal LOC individuals are associated with handling events, while externals constantly defend themselves instead of taking responsibility for their lives.

The LOC construct has also been applied to studying diverse behaviours and attitudes in the health field (e.g., Wallston & Wallston, 1978; Trevino & Ernst, 2012). For instance, others confirmed that stress management studies support the hypothesis that a correlation exists between stresses moderated by LOC of the personality (Kobasa & Puccetti, 1983; Cummins, 1988). On the lack of internal health locus of control, Blaxter's (1990) findings show adverse health-related attitudes such as tobacco smoking, low leisure-time activity, unhealthy dietary habits, and high alcohol intake are statistically related. In addition, Lindström and Rosvall (2014) reported a significant association between lack of childhood and adulthood economic stress and lack of internal health locus of control using a public health survey of Southern Swedish participants.

Others established that prayer coping significantly explains 24% of the variance in health locus of control amongst 202 cardiac clients from the University of Michigan

Medical Centre (Ai, Peterson, Rodgers, & Tice, 2005). Ai et al.'s samples were characterised by male (55%), Caucasian (91%), married with spouse present (74%) and Judeo-Christian (83%) with a mean age of 63. Whilst depression is found to have a negative correlation with an external locus of control and self-esteem (Yu & Fan, 2014, p. 3), Mautner et al. (2015) showed that health locus of control has a significant predictive power with patients' patronage of health facilities. Mautner et al. concluded that health locus of control could improve clients' perception of their health condition, thereby influencing their usage of medical facilities.

In addition, the LOC construct has been found favoured by researchers studying youth transition from school to work attitude and cognitive processes (Perry, Liu, & Griff, 2011, p. 168). Such predictions of work ethics are based on Super, Savickas, and Super's (1996) assumption that the youth are likely to be autonomous and self-motivated in mastering the tasks of crystallizing, specifying, and implementing their career choices whilst leaving school. Interestingly, Perry et al. reported that geographical dichotomy scores for urban and rural youths exist, which they sharply attributed to their cognitive views on future orientation in the world of work because of external factors such as labour market segregation, lack of financial resources, and discrimination. However, the researchers did not also rule out demographic variables such as age, race, social strata, gender, or combinations. Indeed, Lloyd and Hastings (2009) reported that age significantly predicts individuals' locus of control. Lloyd and Hastings' conclude that the development of locus of control is also a function of the history of reinforcement and behavioural expectations.

In support of the developmental process of internal and external locus of control, others conceive that one's social values and self-identification of self-knowledge play essential roles (Ryan & Connell, 1989). Such findings support Rotter's (1975)

description of human behaviour as contingent on social perceptions and outcomes individuals expect from their actions. Consequently, the current study positions the LOC construct within environmental factors (school, curriculum, family, and socialisation) as determinants of students' choices in entrepreneurship decision-making from Ghanaian public universities.

On what causes individuals' external LOC, some researchers have discovered the relationships between their social environments and familial factors. For example, “persons from the lower social classes generally have a more external locus of control than persons from the upper social classes. . . .” (Diemer & Ali, 2009, p. 252). Another dimension to the youth career aspirations and LOC is reported by Gottfredson (1981) that career percentage of variance may explain career LOC developmental stages in life as they become more aware of their environments and socialisation process likely to impact career choices. In Africa, economic status and gender also predict university students' locus of control. Similarly, gender differences have dotted the locus of control literature (Akhtar & Saxena, 2014). For instance, Serina, Serina, & Sahin (2010) report that male students' score on locus of control is higher than their female counterparts, with students from high-income backgrounds also reporting much higher internal locus of control than those from poor socio-economic backgrounds in Nigeria. Familiar studies on gender have been reported in other jurisdictions (Richert, 1981).

Relationships also exist between teacher LOC and student achievement (Weiner, 1985). Others include students psychological empowerment (Wang, Zhang, & Jackson, 2013; Senler, 2016); job attitude (Bedel, 2008); satisfaction (Elias, 2009; Sünbül, 2003), and organisational role stress and managerial effectiveness (Srivastava, 2009). LOC has also been seen for career activities (Millar & Shevlin, 2007; Perry, Liu, & Griff, 2011; Siyez, 2015), academic self-efficacy and tutoring on academic

performance (Yesilyurt, 2014; Drago et al., 2016), daily living (Ryon & Gleason, 2013), as well as problem-solving in relationships (Morry & Harasymchuk, 2005; Chhabra, 2013; Neal, Weeks, & DeBattista, 2014).

Refreshingly, one of the most widely studied attitudinal constructs in the field of behavioural science is Rotter's locus of control, particularly amongst career development experts (Perry, Liu, & Griff, 2011, p. 168) and generally accepted by organisational scientists (D'souza, Agarwal, & Chavali, 2013, p. 336). Avalanche of research linking internal locus of control to higher earnings (Osborne, 2005; Semykina & Linz, 2007; Piatek & Pinger, 2010) and faster career growth (Schnitzlein & Stephani, 2013) have been reported. Other researchers report empirical results for job search and internal locus of control and posit that the duration of finding jobs will be shorter for individuals with a high internal locus of control than those with a low internal locus of control (Gallo et al., 2003). Employees' job satisfaction and LOC also have a relationship (Ng, Sorensen, & Eby, 2006).

The entrepreneurship and economic literature have also witnessed the application of the locus of control construct (Sadler-Smith, 2004). However, Sadler-Smith (2004, p. 159) points out that early entrepreneurship research mainly focused on successful entrepreneurs' internal and external locus of control. Findings on the relationship between entrepreneurship and general locus of control have shown significant internal locus of control amongst Russian university students with no gender differences (Kaufmann, Welsh, & Bushmarin, 2001, p. 7). In line with entrepreneurship, significant others have tied the locus of control with economic activities such as human capital investment (Piatek & Pinger, 2010) and economic locus of control. Unquestionably, formulating economic and business decisions comes with risk-taking. Researchers have also shown an instinctual relationship exists between

households possessing internal economic locus of control and significant risk-taking behaviour in risky asset investments (Salamanca, Grip, Fourage, & Montizaan, 2015). Commenting on Salamanca et al.'s revelation, Cobb-Clark (2014, p. 15) suggests that individuals with low scores on internal economic locus of control are risk averted and might not dare invest ideas. Another major work on economic activities and saving attitudes amongst rich and poor Australian households' internal locus of control demonstrates that households with internal reference persons tend to save a significant percentage of their permanent incomes than those with low feelings of internal locus of control (Cobb-Clark et al., 2013).

Economically, savings habit is a linear combination of several factors, including nations' tax policies, incomes, and cognitive traits, as demonstrated by Salamanca et al. (2015) and Cobb-Clark, Kassenboehmer, and Sinning (2013) (2013). Slavin (2005, p. 281) also quoted a research paper by Michael Boskin, who estimated an incredible wealth accumulation of baby boomers between 1946 and 1964 from their pension benefits due to the tax-free policy of the US government at the time. In the Ghanaian context, the living standard survey (GLSS-5) shows that multiple demographic variables such as age, education, income levels, health registration insurance, household size, and marital category have a linear association with financial savings habits (Kodom, 2013). Kunateh (2012) reports the views of Ghanaian banking giants such as Alhassan Andani, who bemoans the low savings culture amongst Ghanaians, with the report submitting that savings have the potential to contribute to the GDP and socio-economic development. The GLSS-5 Report also states that the General Manager of the Begro (Eastern Region) Cooperative Credit Union intimates the role of savings in rural poverty reduction whilst attributing rural poverty to households' ignorance about savings (GNA, 2011). Invariably, many initiatives to cultivate savings habits

among Ghanaian youth and household members seem to originate from financial institutions during product lunches (Adjei, 2014; Adjei, 2016). Slavin describes individuals' average propensity to save as the percentage of disposable income saved and marginal propensity to consume as a function of income - when income increases, consumption also rises. Heuristically, when would-be business owners possess such economic knowledge on savings, their entrepreneurial perception about their internal locus of control could improve. Such assumptions would be worth testing in the current study using cross-sectional data from different students' socio-economic backgrounds (See Part D2, Appendix C) in the Ghanaian context. The views on savings from the Ghanaian banking stakeholders are mainly anecdotal and lack empirical support. Hence, using empirical data, the current study challenges the anecdotal reports in Ghanaian circles about poor savings habits and lack of entrepreneurship initiatives by testing the graduating business students' locus of control traits with a discriminant function (see Section 4.1.3).

In addition, the current study recognises the institutional forces (external) that might prevent students' enterprise formation, though not a direct subject of pursuance. Despite widespread research involving the LOC variable, others believe that more empirical studies are required to contextualise the variable in different cultures and settings since demographics are not stable traits for individuals (D'souza, Agarwal, & Chavali, 2013). Following the general controversies surrounding the initial construct definition, Rotter (1975), in his later works, introduced the expectancy element of the LOC theory and reiterated that the LOC has widespread applications in different spheres of human life. Consequently, the current study extends the LOC theory to investigate students' economic perception of entrepreneurship behaviours as they leave Ghanaian public universities. Clarifying Rotter's original work, Kormanik and Rocco

(2009: 468) used social learning theory to remind researchers of three essential constituents of the LOC theory - (i) the person's expectations for reinforcement, (ii) the perceived value of reinforcement, and (iii) context in which the behaviour occurs. Therefore, the current study considers business students' expectations of their financial rewards in life, the perceived values they attach to economic activities in life, and which Ghanaian environments they think have the potential to boost economic rewards by applying creativity to opportunity recognition as would-be entrepreneurs. In summary, the economic locus of control scale measured students' internal and external economic locus of control in this study (see Appendix C, Part B3). Career counsellors could apply the LOC measure in Ghanaian universities as they prepare students to develop an internal locus of control for innovative thinking.

2.1.9 Risk-Taking and Entrepreneurship Interest

Some strategic management thinkers believe that the volatilities in today's fast-changing markets and organisations should compel managers to be willing to employ risk-taking in their strategic operations (Thompson Jr. et al., 2005); failure is likely to spell doom for the organisation (Naldi, Nordqvist, & Joh, 2007, p. 35). Businesses today face fast technological innovations and enormous change (Laudon & Laudon, 2007) for prospective entrepreneurs (e.g. business graduates). Therefore, career counsellors should support students to develop risk-taking propensities for the world of work. Indeed, amongst the traits approach to explore entrepreneurs' characteristics, risk-propensity also receives early recognition. Kamalanabhan, Sunder, and Mansh (2006, p. 38) revealed that dating back to the first half of the 19th century, Mills (1848) pioneered risk-taking and outlined its power for entrepreneurs' character. In addition, others advocated the need to understand the unique traits of entrepreneurs' risk-taking behaviour (Palmer, 1971) and the likelihood of business formation (Hull, Bosley, &

Udell, 1980). Therefore, this segment discusses the risk-taking theory underpinning this study, its applications in diverse human endeavours, and its implications for career counselling.

Some individuals are risk averse, while some are high-risk takers (Chandler & Pronin, 2012, p. 370). Some argued that entrepreneurs take calculated risks (Timmons, 1989), whilst Carland, Hoy, Boulton, and Carland (1984) (1984) established that risk-taking is a characteristic of business owners in general rather than entrepreneurs only. Similarly, others have observed a relationship between locus of control and risk-taking behaviour (Miller & Friesen, 1982). Sharland (2006) argues that risk-taking is, to some extent, an acceptable and relevant variable of adolescent growth. On the other hand, gender dynamics of adolescent risk-taking show that males are more likely to take risks than their female colleagues (Byrnes, Miller, & Schaffer, 1999). Vermeersch, T'Sjoen, Kaufman, and Houtte (2011) reflected on individuals' differences in risk-taking propensity using social-cognitive developments and peer relationship frameworks. Agreeably, Vermeersch et al.'s social-cognitive thoughts have placed risk-taking propensity within the context of environmental determinism as seen with Rotter's (1966) locus of control, Bandura's (1994) self-efficacy, and McClelland's (1990) need for achievement. Consequently, the current study sought to evaluate Ghanaian final-year business students' environmental forces, such as culture, physical infrastructure, social context, etc., in entrepreneurship behaviours.

Recent scientific data also showed that poverty has an inverse relationship between stress, risk-taking, and decision-making, possibly through lack of attention and resigning to one's fate instead of goal-directed behaviours (Haushofer & Fehr, 2014). Explaining the conundrum of poverty on risk-aversion, the researchers theorised that the economic and social conditions of underprivileged people in the US might influence

access to economic resources, leaving them with no collateral for securing financial support for business activities. In the Ghanaian ewe tribe, the elders have a cliché, “*tornye via dzi koemele*,” which translates as “*I am content with my small dream*.” Such clichés are engrained in the minds of the youth growing up and facing risky decisions; they might develop cognitive dissonance (Festinger, 1957) and become risk-averse. Consequently, risky behaviours might vary for diverse cultures depending on enculturation processes and socio-economic factors. Concurring with such a theory on poverty and risk-taking, the current study seeks to extend the debate by associating poverty with cultural norms and values for would-be entrepreneurs (Appendix C, Part 2D).

Also of interest to this study are risk-taking propensity and the influence of birth order on entrepreneurship activities in the Ghanaian environment. Other studies have demonstrated empirical support for the hypothesis that risk-taking and birth order relate. For example, in a meta-analysis using evolutionary theory with 24 previous studies, Sulloway and Zweigenhaft (2010) showed that the odds of lastborn engaging in risky behaviours are 1.48 times higher than firstborns in areas of dangerous sports. The researchers concluded that younger siblings are more extroverts, open to experience, and are more likely to involve in high-risk ventures compared with older siblings in consonance with similar findings from Healey and Ellis (2007) and Wang, Kruger, and Wilke (2009).

Others have also established that individuals' risk-taking propensity seems to decline as they age across different countries (Mata, Josef, & Hertwig, 2016, pp. 234-235). It is significant to note that Mata et al. used life-history theory to show variations between age and risk-taking intent using conditions existing in local communities. Thus, they concluded that harsher environments found in Mali and Nigeria indicated

no decline in risk-taking amongst the older folks. Presumably, individuals have to survive well into old age in Africa, and this cannot be compared to the thriving lifestyle of white colour workers. Therefore, environmental conditions could be significant covariates in predicting risk-taking propensity according to diverse cultures and poverty levels. Hence, students leaving Ghanaian universities could face similar traits (e.g. birth order, poverty, different geographical locations, and business opportunities) that will likely influence their risk-taking ability and entrepreneurship.

In measuring risk, multidisciplinary researchers are advocating for a domain-specific risk scale as seen in Rotter's (1966) locus of control and Bandura's (1994), a deviation from the classical psychological measures of the risk construct (Blais & Weber, 2001). For instance, Kruger, Wang, and Wilke (2007) argue that as researchers often push for domain-specific construct measures in adjunct academic fields, such fields usually seem to lack priori theories for explaining new terminologies. In line with Kruger et al.'s view, the current study adopts the *situated rationality theory* (SRT) to explain entrepreneurial risk-taking propensity. Several theories, such as fuzzy trace and dual processing, are used to study risk-taking intention. Others believe fuzzy trace is convenient for exploring adolescents' risk propensity but often lacks rational thinking (Sunstein, 2008). The SRT countenance the shaky and irrational conjecture that safe and high-risk behaviours are dichotomous and instead proposes that each type of risky behaviour comes with underlying rationality the individual makes. The theory contends that the risk-taker has a host of justifications to offer for taking or not taking risks, and we should not assume that the individual is just a crazy or thrilled seeker. The SRT also accounts for peer pressure and social context in risk-taking propensity since these forces could influence the acceptance or rejection of risky behaviour. Overall, the SRT is an offspring of Albert Bandura's social cognitive model and Ajzen and Fishbein's (1980)

Theory of Planned Behaviour. The SRT has seen applications in business and construction sites risk-taking (Choudhry & Fang, 2008), keeping status quo with superiors and unsafe driving (Keating & Halpern-Felsher, 2008), and occupational safety behaviours (Hambachet al., 2011). Therefore, it is pretty explanatory to investigate university students' risky decision-making in a school context.

2.1.10 Goal-Setting Theory and Entrepreneurial Trait Acquisition

Literature on goal-setting recognises the multiple constructs to describe an individual's targeted behaviour (Pintrich, 2000). However, Pintrich points out that apart from achieving goals, individuals may also strive for several other life goals. Generally, goals span many aspects of human life, which led Ford (1992) to classify 24 basic motivations, including safety, belongingness, creativity, joy, mastery, exploration, understanding, and superiority, just to mention a few. Thus, goals are a "ubiquitous" part of human life, and one goal or the other drives every individual's accomplishments (Collins, Mowbray, & Bybee, 1999, p. 483).

A goal is defined as the object or objective an individual is striving to accomplish (Locke, Shaw, Saari, & Latham, 1981). Contributing to its importance, the *Ontario Leadership Strategy Bulletin* (2010: 1) explains, "Goals help us focus our energy and actions, measure our progress, and ultimately achieve purposeful results." Succinctly put, goals are desirable mental and physical states towards which people direct their actions and efforts (Rollinson, Broadfield, & Edwards, 1998). Meacham (2004) offers that goals represent anticipated events that motivate individuals' behaviour. Clarifying multiple purposes of goals, Locke et al. state that they help individuals to achieve key performance indicators, guide action, help efforts on task, serve as encouragement, and support the development of strategic behaviour, too. For the individual, empirical findings show that goal-setting enables people to focus on

finishing an overarching task (Marsh, Hicks, & Bink, 1998; Marsh, Hicks, & Bryan, 1999) as well as help people to suppress their destructive behaviours (Diefendorff, Snyder, & Lord, 1997).

Goal-setting is a constituent of motivational models. Goals have intrinsic and extrinsic motivational attributes that influence how individuals' competence is evaluated (Elliot & Harackiewicz, 1994, p. 969). Hence, others consider goals as guides to everyday pursuits of humankind, whether short-term, medium-term, or long-term (Kruglanski, 1996). Locke and his associates (1990) postulate that complex and realistic goals will likely result in higher performances than unchallenging goals. Gómez-Miñambres (2012) also extended Locke and Latham's (1990) original propositions on goal-setting effectiveness. Mediator elements of goals, such as focus on selective tasks and the exclusion of activities in one's life, have been identified with control over cognitive and physical effort proportionate towards goal attainment and persistence through time until the goal is achieved (Simons & Chabris, 1999). Other moderators include feedback, commitment, resource constraints, satisfaction, and efficaciousness of goals (Smith & Hitt, 2005). Hence, the current study sought to explore cognitive traits in grit goals, considering mediators and moderators as covariates likely to influence Ghanaian business students' ability to set goals for their lives after school.

Due to the widespread appeal of goal-setting theory, the current study adopted the work of two Industrial and Organisational Psychologists, Edwin A. Locke and Gary P. Latham (1990), as part of high grand theories of social cognitivism for exploring students' intention to achieve higher-order tasks during and after school. Similar to self-efficacy, locus of control, and risk-taking propensity, Locke and Latham's goal-setting theory has received extensive review in the field of management science (Kleingeld, Mierlo, & Arends, 2011) with its applications in health management such as patients

rehabilitation (Holliday, Antoun, & Playford, 2005), diabetic management, (Fleming, et al., 2013), and brain injury rehabilitation (Hunt, Le Dorze, & Trentham, 2015).

Developmental psychologists describe young adulthood as characterised by consideration of different options for identity and directions in later life (Arnett, 2000). Hill, Jackson, Roberts, Lapsley, and Brandenberger (2011:123) contend that establishing goals is one way to develop a “niche or role in life” for the young adult. Incidentally, as graduates leave school, they are faced with myriad choices as to what careers they will be pursuing in the information age (World Bank, 2013) and high rates of unemployment (Aryeetey & Baah-Boateng, 2007; Munive, 2008; AEO, 2015). This is not to say that the future is bleak for today’s youth, but guiding them to negotiated job creations involving cognitive capabilities could provide some assurances. Hence, in line with the behavioural studies of Locke and Latham (1990), goal-setting theory has also been used in entrepreneurship studies to explore the significance of goals to entrepreneurs’ lifestyles and choices (e.g. Bird, 1988). Besides, Hill et al. also studied goal-setting initiatives amongst first and final-year college students using multivariate techniques – the focus of the current study as well is to account for the variance errors in students’ goal-setting and entrepreneurship intents (*see* Section 3.9.0).

The reliability of verbal self-reports generated with interviews, surveys, think-aloud, and simulated recall methods concerns researchers (Pintrich, 2000). For instance, Wright (1992) laments the inability of literature to address the problem of construct validity of goal difficulty. Whilst the veracity of self-reports has not generated different approaches, Pintrich quickly mentions that the nature of goal constructs is cognitive; hence, individuals have to recall such mental traits into consciousness. He then calls for researchers to construct valid test items to measure goals and apply standard psychometric testing to goal measures considering error variance, including social

desirability effects, maturation, and general contextual influences that may bias the self-reports from cases. Locke and Latham (1990) also noted that goal impediments are due to environmental factors such as changes in policy, technology, and information. By extension, since goals are deemed personally constructed targets with environmental determinism, there could be variations in intra-reliability scores. Therefore, measures of goal-setting could produce inconsistent psychometric scores, according to Pintrich. However, the current study used explorative factor analysis in a pilot study and the final instrument construction to determine the internal consistencies (reliability testing) of the exogenous items measuring students' goal-setting that yielded highly significant ($\chi^2(36) = 258.218, p = .001$) KMO statistics and a moderate .682 Cronbach alpha.

2.1.11 Supporting Career Traits with Concern-Based Adoption Model

Hall and Hord's (1987) Concern-Based Adoption Model (CBAM) and the National Educational Technology Standards (NETS-s) provided the framework for the predictor variable, curriculum-specific integration (Factor 1) for this study. Shelly et al. (2006: pp. 3-4) defined integration literacy as the "ability to use computers and other technologies combined with a variety of teaching and learning strategies to enhance student learning." Their definition requires matching appropriate technology to learning objectives, goals, and outcomes to support instructional delivery. Teacher attitudes towards computers and recognising the importance of software integration into day-to-day instructional delivery in HEIs have been reported (Dailey, Wall, Jones, & Killey, 1996). The integration of ICT courses into students' curriculum in Ghanaian business schools aptly reflects the views and recommendations of policy think tanks (e.g. ICT4AD, 2003; Anamuah-Mensah Education Commission Report, 2007) and technology commentators (Oblinger, 2012) that ICTs should be integrated into instructional delivery in schools. Innovation-led initiatives require students to rethink

the necessary skill sets to impact businesses today (Thompson Jr. et al., 2005).

The crust of the CBAM states that technology adoption assumes different levels, as Hall, Wallace and Dossett (1973) proposed. The CBAM identifies the stages of Concern (SoC), which stipulates that technology users follow seven Stages of Concern in implementations. The stages commence with Stage 0 (Awareness), Stage 1 (Informational), Stage 2 (Personal), Stage 3 (Management), Stage 4 (Consequence), Stage 5 (Collaboration), and Stage 6 (Refocusing). However, Hall and Hord (1987) later condensed the seven stages into three. According to Hall and Hord, the three most relevant levels of concerns technology adopters usually expressed are (1) self-concern, (2) task concerns, and (3) impact concerns.

In his Diffusion of Innovation (DoI) theory, Rogers (1995) descriptively refers to Hall and Hord's (1973) Stage of Concern (SoC) as *adopters and non-adopters* (Stage 1), Stage 2 technology users are usually concerned with managing tasks with ICTs and are described as *moderates*. Stage 3 users in the model are called high technology users who are concerned with the impact of technology issues and are described as *innovators*. Level three users are usually concerned with consequences, collaborative issues, and refocusing on integrating technology into their curriculum.

The Concern-Based Adoption Model allows this study to explore students' concerns regarding their current technology integration literacy needed to be entrepreneurs or techno-entrepreneurs. Besides, the CBAM model assisted in the measure of levels of technology adoption of business students as they prepare to provide leadership in entrepreneurship and the acknowledgement that yesterday's education is not sufficient for today's students at workplaces that are constantly demanding students' creativity, innovation, communication, technology, and collaborative skills (Wiltshire et al., 2014). Hence, academic excellence must be attained in today's

technological environment to prepare students to thrive in the digital age (NCREL & METIRI, 2003).

The CBAM is most suitable for evaluating the technology adoption levels of business students, and their adoption of technology since ICT lessons are increasingly recognised in the undergraduate curriculum in Ghanaian universities (ICT4AD Policy, 2003). Though Ghana has no standard-based assessment for the technology literacy of students, the adaptation of the items in the NETS-s probably would evoke debates as to whether students are achieving the requisite skills for technology integration competency, which are significant requirements for the knowledge economy (Laudon & Laudon, 2007; Oblinger, 2012). Similarly, Rogers' (1995) DoI is used in the discussion of the results of this study. Both the DoI and CBAM have been used in educational research in the Ghanaian context to evaluate faculty technology integration into the curriculum (Yidana, 2007). Above all, entrepreneurial capabilities require an approach to certain newness. Thus, innovative thinking with the application of technology would immensely help students' intentions within Ajzen's (1985) revised theory of planned behaviour (TPB) framework.

2.1.12 Posteriori Theories from the Focus Group Discussions

Maxwell and Mittapalli (2008) think qualitative researchers generally believe all observations have underlying theories. According to them, these researchers' ontological and epistemic views are inherently shaped by their prior ideas and assumptions; therefore, there is no probability of purely objective or theory-neutral descriptive independent of some particular views. Consequently, in grounded theory, qualitative researchers argue that theory should emerge after data analysis - referred to as the posterior approach (Given, 2008, p. 74). Given's position was earlier submitted by others who think interpretivists formulate theory inductively from field data (Mason,

2002, p. 125). Maxwell and associates also explain that qualitative researchers do not often explicitly set out to test theories but rather use them in the normative sense rather than the traditional theory with prior considerations with statistical modelling. Though the focus of this study is far from developing a grounded theory, this section sets the agenda for the interrogation of students' views that emerged from the focus group discussions (FGDs). The FGDs emanated from Research Question 2 (RO2), which guided the current study. RO2 sought to explore students' lived experiences on education, indigenous knowledges, entrepreneurship, and ICT integration literacy (Appendix D1).

Again, subjectivists hold a relatively liberal view of theory. They have a position that whilst analysing their data in settings with prior assumptions, existing insights and theories selectively and eclectically reinforce their interpretations (Maxwell & Mittapalli, 2008, p. 876). Using interpretivists' methodology for data gathering and emergent findings, a host of theories – dominated by postmodernism - eclectically informed the narrative data analysis. Critical educational theory, post-colonialism, gender theory, institutional theory, and psychoanalysis emerged from the discussants' opinions. The essential themes and background descriptions underlying some of the theories are espoused in this section to enrich the arguments of the thesis statement (Section 1.3).

Several theorists have defined education differently. To the Pan Africanists, deconstruction of education often strikes the cultural cord as Dei (2012) conceptualises education as an epitome of freedom, social change, and growth embedded in African cultural heritage and knowledges. Dei beliefs in culture are a powerful lens for deconstructing the African worldview and a source of knowledge, identity, and growth. In addition, Nyamnjoh (2012: 4) advances a colonial argument that education in the

African context reflects “cultural violence, self-hate, and mimicry.” Agonisingly, Nyamnjoh’s position can be interrogated within the critical theory of education that sees the imposition of Westernised education as alienating African scholar from their environment. Initially, in his book, *The Location of Culture*, Bhabha (1994) lamented the ambivalence and hybridity of postcolonial theories. It emphasised that one form of resistance to colonialism is the mimicry of the colonisers by the colonised. Commenting on Bhabha’s view on the ambivalence of the postcolonial theory, Sherry (2008) later submits that the colonised tend to encapsulate the victim trap by subtly adopting the colonial matters’ literature, discourse, and culture. Sherry also inferred that colonisation denotes not only unilateral power dynamics, domination, and resource struggle but also displacement, distortion, and dislocation of the colonised psyche. The mimicking of Western culture has been portrayed in the current study, where discussants pointed to attitudes toward goods made in Ghana and the penchant for foreign products and services by Ghanaians (Sections 4.2.6 to 4.2.7).

Eurocentric scholars describe education as instructing and training the young to live meaningfully in society (Boyd and King, 1977). Gwanfobge (2011) shares in Boyd and King’s developmental view of education and submits that man’s (used generically) role since prehistoric days was to support its offspring to effectively and continually exploit his natural environment and improve the social, economic, political, and personal lives. Perhaps Gwanfobge’s views are variant with the imposition of educational systems that challenge the ecological validation of knowledge for a group of persons (e.g. Asante, 1995). What, then, is the education of African indigenous people? Nsamenang (2005) describes the African worldview from a triad perspective to design contextually grounded educational philosophies that could achieve cultural identity for transforming Africa. The first perspective highlights the unscripted African

curriculum. Secondly, different teachers ranging from family elders to siblings are involved, and finally, evaluation of learning based on ethnic and socially acceptable behaviours constituted Africa's educational system. However, missionary-led views of education imported through colonisation have produced victims severed from their cultural milieu. Such voices of victims have been heard in recent narratives of Pan-Africanists (e.g. Nyamnjoh, 2012; Dei, 2012). For instance, Dei's lamentations are in line with earlier admissions by Nyamnjoh that colonial education instead separates the African scholar from his ancestral heritage in the following submissions:

... my colonial education in Ghana taught me less about my own communities than other distant places, which made it difficult to relate education to my lived experiences. Cultural community knowledges were not affirmed in my education and it has taken many years of struggle to shed the Eurocentric gaze and interpretations that have been ingrained in my thinking. (p. 103).

Based on the views expressed by Pan-Africanists (Asante, 1995; Nsamenang, 2005; Dei, 2012), the current study shares the discussants' critical views on education in FGDs sessions (*see* Section 4.2) that the Westernisation of Africa's schooling systems has somewhat separated its scholars from their cultural heritage and promoted schooling instead of education based on critical educational theories. Indeed, critical theory is a broad term that uses the dialogic approach to identify the '*false*' or '*fragmented*' consciousness (Eagleton, 1991). Critical theory has been described as "prescriptive and normative that conveys discordant perspectives on issues ranging from democracy, politics, literature, economics, development, and psychology (Fay, 1987; Morrison, 1995a). Similarly, scientific research has also seen wide applications of critical theory to understanding phenomena that give accounts of society and behaviour (Cohen *et al.*, 2007). However, the current work takes a narrow view of the critical theory that locates the lacuna in the business education curriculum to prepare

students for the knowledge economy. Hence, this section considers a crucial lens on pedagogy, philosophy, and value systems of students' learning.

The second dominant theory that emerged from the qualitative data analysis is the anti-colonialism. A sharp departure from always assuming the victim position in the academy as colonial theorising offers, the anti-colonial framework seeks to focus on the present and redirect the victims, the marginalised, and the indigene's energy into advanced thinking for reclaiming the past (Simmons & Dei, 2012). They also submit that the anti-colonial discourse revolves around politics, knowledge construction, and lived experiences of individuals other than the Eurocentric views of the colonial states and their peoples. The anti-colonial framework recognises the contribution of the local people in their environments. Credit is given to some founding fathers such as Frantz Fanon, Gandhi, Jawaharlal Nehru, Mao-Tse-Tung, Aime Cesaire, Kwame Nkrumah, Leopold Senghor, Marcus Garvey, George Padmore, and W. E. B. Du Bois, to name but a few, whose voices advocated the need for self-reliance in the African academy.

From the Africanist literature, the colonised often used various linguistic dialogues to deconstruct colonisation. Suppression, power, revolution, dominance, resource exploitation, slavery, imposition, and freedom have all represented the history of a colony occupied by Europeans (Asante, 1995; Dei, 2012; Nsamenang & Tchombe, 2011). Such terminologies tend to evoke bitter memories for the victims of colonisation, with the educational systems not spared as well. For instance, some scholars submit that Western education, interwoven with missionary ideals and colonisation, is imposed on the African colonies, not secular (Gwanfogbe, 2011). However, Dei (2012) suggests that anti-colonial philosophers and revolutionaries continue to inspire many to confront today's interventions within a developmental framework instead of focusing on colonialism or post-colonialism.

What, then, are the signposts of the anti-colonial theory? Simmons and Dei (2012) provide comprehensive labels outlining the theory. They contend that Indigenous knowledges form the foundation of intellectual heritage for the colonised other than the imposition of Western academy. Secondly, the historical origin of the colonial masters should be seen in light of dominance and oppression. In addition, modern thinking must question relationships, cultural control, resource allocation, self-identity, power play, spirituality, and the subtle emergence of dominance through schooling regimes in the colonised prisms (Adzahlie-Mensah, 2013). Applying the anti-colonial framework to education, Foucault (1980) sadly positions the formal classroom as an obedience-seeking environment over a counter and resistant form of knowledge acquisition.

In line with the thinking of Foucault (1980), some Africanists today continue to challenge the value of education as not meeting the demands of industry and society (Dogbevi, 2007; Darkwa et al., 2012; Abu, 2012; IMANI Ghana, 2013; Hardi, 2012; McCown, 2015). Consequently, the dominant views expressed by discussants in this study can best be explained within the anti-colonial legacy, where renewed thinking about the African situation should be encouraged. For instance, in debating the competitiveness of the Indigenous Ghanaian businesses, some discussants believed that the inferiority complex affects Ghanaian goods compared to goods from Western countries (see Figure 20). Such a case probably demonstrates the impact of relationships, dominance, power, and indigenous knowledges as copyrighted knowledge to be accepted and developed for the African academy.

2.1.13 Entrepreneurship and the Theory of Planned Behaviour

Finally, the theoretical foundation of this study includes the theory of planned behaviour (TPB), initially proposed by Icek Ajzen to investigate business students'

entrepreneurship propensity. Ajzen's (1991) TPB is an extension of the theory of reasoned action (Ajzen & Fishbein, 1980) to account for the original model's limitations in dealing with behaviours over which people have incomplete volitional control. Ajzen proposed that intentions are motivational drivers that guide individuals towards how rigid and willing they are to achieve their goals. Performance achievement depends on how strong an individual's intentions are towards a goal. Intentions occupy a central theme in TPB. Indeed, TPB shares its principal concept of perceived behavioural control with the theory of achievement motivation (Atkinson, 1964) and perceived self-efficacy (Bandura, 1982) yet, with slight variation in individual's anticipated resources management in the case of TPB.

According to Hobbis and Sutton (2005: 8), the TPB has been widely applied in empirical studies to identify the predictors of people's covert and overt behaviours. In his review of the TPB, Ajzen (1985) acknowledges the inherent limitation in the model that intentions of planned behaviour are only feasible with access to requisite opportunities and resources such as skills, money, time, and environmental support. He describes the availability of such resources as the individual's actual control over their behaviour. A wide range of domains such as animal learning, level of aspirations, person perception, attribution, performance of psychomotor, and cognitive assignments have all seen applications of the TPB. Therefore, the choice of TPB for the study of students' intention to undertake entrepreneurial tasks is also positioned within the high grand theory of social-cognitivism theory.

The TPB has received extensive empirical support in entrepreneurship intentions study as well. For instance, Sieger, Fueglistaller, and Zellweger (2011) used TPB in their study amongst universities to measure students' intentions of entrepreneurship activities after graduation. Significant to this study is the TPB to

investigate students' entrepreneurship intention towards enterprise creation with similar other entrepreneurship researchers (e.g. Tounes, 2006; Boissin, Chollet, & Emin, 2008; Jinying & Pelagie, 2014). The TPB proposes three foundations of intentional behaviour. Thus, the intention to undertake a particular behaviour is likely to be influenced by (i) the individual's attitude, (ii) his/her subjective norms, and (iii) the constructed control mechanisms directing the intended conduct. Jinying and Pelagie further explain that the stronger the individual's intention to engage in behaviour, the more they are likely to perform it. Indeed, much of the research into intentions focused on proximal behaviours but not long-term goals, but TPB does appear applicable to entrepreneurship (Krueger & Carsrud, 1993). The current study explored students' entrepreneurial propensity (intention) in Ghanaian public universities as the primary experimental variable using multivariate approaches. In addition, the study examined students' personal background and institutional factors as antecedents.

However, the study adhered to the caveat of wholesale adoption of entrepreneurial intention instruments in different cultures without exploratory and confirmatory factor analysis procedures. For instance, adopting such instruments has led Couto, Mariano, and Mayer (2013) to suggest that cultural variations are present in entrepreneurship intention measures using factor analysis techniques in the Brazilian context. Consequently, the adopted instrument for this study also employed rigorous factor analysis techniques to achieve ecological validation (*see* Section 3.4). The current research draws on students' strengths and abilities to exercise their cognitive powers in determining entrepreneurial propensity within the framework of their acquired curriculum whilst acknowledging the limitations of being unable to account for the availability of other resources, such as infrastructure and money, to students in the research design. However, the study used the ICT integration construct as a

covariate in the MANCOVA model (Section 3.9.1) to account for confounding variables in the dependent factor (social cognition) for Research Question 1. According to Hobbis and Sutton (2005: 9), the underlying theme of the TPB emphasises behavioural change that accounts for individuals' attitudes, perceived norms (individual or social), and perceived behavioural control. Therefore, such a theory would immensely help diverse experts such as career guidance and counsellors, HRM practitioners, and entrepreneurship coaches in managing the cognitive intentions of would-be entrepreneurs.

2.1.14 Historical Origin of Entrepreneurship

This section explores scholarly views and debates on what constitutes the entrepreneurship career study. Jinying and Pelagie (2014, p. 107) categorised scholars' attempts to understand entrepreneurship study into three. The first approach focuses on understanding entrepreneurs' personal characteristics, beliefs, and attitudes (e.g. McClelland's (1965) need for achievement, Bandura's (1982) self-efficacy mechanism, and Rotter's (1966) internal-external locus of control). According to the entrepreneurship literature, the second layer of research in the field involves exploring entrepreneurs' social environment. Environmental factors such as networking and social groups likely to provide resources for investment dominated the researcher's work as well (e.g. Robinson, Stimpson, Huefner, & Hunt, 1991), with the roles of institutions in supporting entrepreneurs' intentions as the third dominant area in entrepreneurship research.

Acemoglu et al. (2003) cited institutional support from political, economic, and national legal frameworks for successful entrepreneurship takeoff. Such divergent perspectives on entrepreneurship research set the tone for the current review with similar propositions on the credentials of its researchers, conceptual definitions,

historical emergence, theories, and the struggle to attain academic status. Commenting on an institutional report seeking to promote enterprise culture amongst students in UK's higher education institutions (HEIs), Pittaway and Cope (2007: 480) bemoan how several questions remained unanswered, including operational definitions of 'enterprise' or 'entrepreneurship' in the HEIs literature. Pittaway and Cope think that the controversy also extends to constructing meanings of employability skills, social enterprise creation, self-employment, venture creation, employment in small businesses, small business management, and high-growth ventures as contemporary entrepreneurship subjects interest academics. Consequently, this controversy led Lazear (2005, p. 673) to whimsically submit, "The definition of the entrepreneur is somewhat arbitrary." Writing in the *Journal of Business Venturing* on entrepreneurship definition brouhaha, Bull and Willard (1993, p. 185) also think that contributors to the entrepreneurship literature seem obsessed with what constitutes the term 'entrepreneur', which is a dominant position isolating 'entities' rather than 'processes.' The obsession with defining the term entrepreneurship probably partly emerged from the desire to give it an 'ivory tower' recognition.

In effect, some scholars' attempts to establish the parameters for the entrepreneurship concept have resorted to historical, classical, and semiotics appreciations guided by their diverse academic fields. Accounting for its linguistic origin, a 17th century French Language morphemes, 'entre' (enter) and 'predrendre' (to take), translated into English Language as *to undertake* had been offered as the first diagnostic approach to deconstruction of "the entrepreneur" (Kuenyehia, 2012). Indeed, the etymology of the entrepreneurship construct seems to have been shared by its modern applications and definitions. For instance, The classical and neoclassical definitions of entrepreneurship have tilted towards the oligarchy business practices and

economic model building following the initial works of the founding fathers in the field, according to Bruyat and Julien (2000, p. 167). Oligarchy businesses seem to dwell considerably on engineering enterprise models. Similarly, Cantillon, Turgot, Say, and Schumpeter (all economists) laid the foundation stones for today's definition of entrepreneurship. Captivatingly, the dominant attribution of the classical definition of "the entrepreneur" attributed to the Austrian economist Joseph Schumpeter (1883-1950) was contested (e.g. Kuenyehia, 2012). Authors such as Bula (2012) posthumously accorded this enviable recognition of the first economist to have acknowledged the entrepreneurship concept to Richard Cantillon's (1755) manuscript. According to Bull and Willard (1993), in their classic work, Cantillon described the entrepreneur as an individual with the role of all exchanges and circulations in the economy. In the same fashion, Bruyat and Julien (2000: 167) rated Schumpeter as fourth in the genealogy pecking order and quoted Cantillon as he offers his definition as well - "The entrepreneur is someone who assumes the risk and may legitimately appropriate any profits." Differentiating the entrepreneur from an equity owner, Turgot and Say agreed with Cantillon's risk-taking propensity behaviour, in addition to the fact that the entrepreneur is also responsible for assembling and managing resources for the production process. Perhaps the definitions of the founding fathers (with economists' backgrounds) tend to assume expansionist paths that seem to trust production resources to organisations' innovative minds.

The '*production*' concept in the founding fathers' definitions of entrepreneurship clearly illustrates the epoch of the industrial revolution, ignoring today's service industry when the creation of service enterprises upsurge drastically after World War II in the US and other parts of the world (Gaither, 1996, p. 12). Coupled with market forces at its embryonic stage, the field of entrepreneurship has

seen the importation of economic models with Schumpeter (1934), Kirzner (1997) and Shane and Venkataraman (2000) as advocates of innovation-opportunity criterion.

A similar historical account of ‘the entrepreneur’s concept has been attributed to the writings of another French economist, Jean-Baptise Say, in the early 19th century, who emphasised its productivity maximisation in a production process (Drucker, 1985, p. 21; Kuenyehia, 2012, p. 19; Bula, 2012). Drucker questioned Say’s definition on the ground that the economist’s definition is silent on the identity of the entrepreneur, thereby igniting more confusion over defining ‘entrepreneur’ and ‘entrepreneurship’ leading giants like Schumpeter (1934) to explain that the role of managing an enterprise is an innovative venture. In addition, Drucker does not require entrepreneurs to cause change but sees them as exploiting the opportunities that change (in technology, consumer preferences, social norms, etc.) creates. Drucker thinks the entrepreneur always looks for change, responds to it, and exploits it as an opportunity. Surely, the notion of ‘opportunity’ has become the focus of current definitions of entrepreneurship, where innovative thinking is said to eradicate obsolete production methods in different industries. In turn, even newer and more efficient advances eventually destroy these innovations (Ireland, Hitt, & Sirmon, 2003), leading to a cycle of creative and strategic thinking. Hence, Schumpeter refers to an individual who leads the enterprise operations as an “entrepreneur” (p.74).

Similarly, developing a premise for his conceptualisation of an entrepreneur, Schumpeter (1934) proposed that economic growth occurs when “new combinations appear discontinuously, which is popularly referred to as ‘creative destruction.’ In an attempt to outline the tenants of the entrepreneurship concept following his criticisms, Drucker himself offers a personal view from the perspective of the USA industries that the entrepreneur is an individual who commends their/her own new and small business.

Drucker continues a 30-year-old definition of entrepreneurship in the face of new companies and concludes that not every new small business can represent an entrepreneurship venture. McDonald's fast food conglomerate, used as an example of food preparation, has existed for centuries. Drucker asks what could be new without applying science, management theories, concepts, and practices, standardising the products and services, designing new processes, tools, training, and setting standards. Admittedly, Drucker considers managerial inputs as added competency that qualifies the entrepreneurship construct but joined the chorus that newness is a unique distinguishing feature as seen in Schumpeter's and other contemporary definitions.

Indeed, the controversies surrounding the definition of entrepreneurship are legitimate within the assertions that a minimal level of consensus is required on the definition of what a scientific field "is and is not" on its central themes despite existing disagreements on the fringes (Bruyat & Julien, 2000, p. 166). In the Ghanaian case, the conception of the entrepreneur [as an entity] by Kuenyehia (2012) focuses on the case study of successful Ghanaian entrepreneurs. Therefore, in the opinion of this study, the debates and fierce criticisms of themes and theories in entrepreneurship literature swiftly evoking academic debates could be a healthy development for intellectual engagement in entrepreneurship. Consequently, the subsequent segment of this chapter attempts to deconstruct the varied positions offered by multidisciplinary scholars in the field of entrepreneurship to position the current work within an acceptable definition of the measurement and evaluation of students' propensity to undertake newness and creativity in their future career aspirations.

Indeed, following the ground-breaking conceptualisation by the classical school of thoughts on entrepreneurship, Schumpeter's definition seems to have stood the test of time in the entrepreneurship literature but has to be evaluated within the parameters

of his economic background and the epoch of the Industrial Revolution, that might have shaped his thoughts on the subject. However, latent writers offering slight variations in definitions based on their academic orientations are discussed with others drawing on the classical economic thinking, industry context, and social disequilibrium models coupled with market upheavals that leave cracks in established systems with creative minds to bring equilibrium (Kirzner, 1997). Sadly, the disequilibrium model of entrepreneurship has been heavily critiqued as reducing the whole business of entrepreneurship to mere alertness rather than the combination of scientific and creative forces in solving societal challenges through goods and services design and production (Schumpeter, 1934; Rothbard, 1985).

Extolling the potential of the entrepreneurship concept as a field of academic research in the *Academy of Management Journal*, Shane and Venkataraman (2000) offered an elaborate and strategic meaning of the entrepreneurship construct as opportunity discovery, evaluation, and examination of opportunities for new products and service production to meet the needs of markets. The opportunity discovery element of entrepreneurship definition has also been reiterated by Anderson and Starnawska (2008, p. 223) when they posit that entrepreneurship refers to “the process of becoming, thinking, planning, conspiring, and doing the things that may lead to entrepreneurship.” The consensus view assumes that entrepreneurship seems to be a process of meeting societal and individual opportunity nexus through new creations in understanding entrepreneurship (Ireland & Webb, 2007). Thus, the method establishes entrepreneurial alertness leading to opportunity recognition, then to opportunity exploitation with the creation of a new venture, and finally to the growth and survival of the venture (Begley & Boyd, 1987; Shane, 2003; Webb, Tihanyi, Ireland, & Sirmon, 2007). Earlier, Venkataraman (1987) offered an elaborate view of entrepreneurship as the scholarly

review of how, by whom, and with what effects opportunities to create future goods and services are exploited in context. It is worth mentioning that Venkataraman's thinking has incubated several academic programmes offering entrepreneurship education globally, given the potential interests generated by diverse scholars. Bull and Willard (1993) view Schumpeter's conceptualisation of 'newness' as (a) the creation of new goods and services, b) the improvement of new quality of goods and services, (c) the reengineering of new methods of production, (d) the venturing into new markets, (e) the conquest of new sources of raw materials, or (5) the reorganization of industries.

Bruyat and Julien (2000) have expanded the definition of entrepreneurship to include the '*constructivism*' model. With social constructivism ideology, they proposed that the science of entrepreneurship should consist of the individual and the environment within the context of innovation value creation and accepted that an entrepreneur is an individual or group of people creating new ventures. Sometimes, entrepreneurship is also viewed in light of activities concerning selling products or services in a market. Indeed, Bruyat and Julien's meaning of entrepreneurship also supports Schumpeter's (1934) conception of innovation-driven entrepreneurial competency.

To Tlaiss (2014), entrepreneurship career choice includes cultural and economic nuances, whilst Reynolds (2005) and Kauffman (2007) also believe it constitutes a fundamental transformation with innovative thoughts to an enterprise value creation. To some, an entrepreneurship career is a form of organisational creation, renewal, or innovation for existing and new firms (Sharma & Chrisman, 1999, p. 17). Another perspective considers entrepreneurship as a process that integrates with other processes or events in organisations and society in general (Ireland & Webb, 2007, p. 894), whilst Chernyshenko, Uy, Gomulya et al. (2013) offered an enterprise creation perspective of

entrepreneurship as any effort to start or build a new business or a new venture.

A typical pattern reflected in the definitions offered in this section thus far reiterates the fact that the phenomenon of entrepreneurship career can best be understood by considering the individual (the entrepreneur), the project (business), the environment, and also the connection between them over time with the concept of 'newness' seen in Schumpeter (1934) and Peter Drucker's (1985) views. However, contemporary views hold that an entrepreneurial career has several perspectives articulated by others (Bruyat & Julien, 2000; Lumpkin & Dess, 1996; Ireland, Hitt, & Sirmon, 2003; Dobrev & Barnett, 2005). Whilst focusing on the social and technological embodiment of knowledge (disequilibrium) in explaining entrepreneurship, significant others also think that bringing harmonious closure and stability (Pinch & Bijker, 1987; Hargadon & Douglas, 2001; Samuels, 2004) and compilation of divergent views (Bijker et al. 1987) should be paramount. Similarly, social constructionists believe that prior social experience (Hargadon & Douglas 2001) is required in entrepreneurial career decision-making. Chiles, Bluedorn, and Gupta (2007) opposed the homogeneous social order. They advocated for divergent thinking towards markets and rational expectations to construct new markets when conceptualising the same phenomenon since interacting agents constantly spur change in market dynamics. In addition, Chiles et al. emphasise entrepreneurs' subjective expectations and future orientation for prospective clientele. In their incendiary claims, they also hold a dynamic creative view that entrepreneurship must operate in space that combines heterogeneous resources to innovate and design new products and not only depend on anachronous market order (as advocated by the disequilibrium view).

The newness view in the entrepreneurship literature probably reflects the notion that the entrepreneur must constantly be scanning their environment. Thus, engaging in

scenario planning and responding to environmental stimuli such as interest rates, subsidies, information networks, competitors, new entrants, markets, etc., also portrays an entrepreneur as a human capable of innovation, learning and influencing their environment. To expatiate on the environmental scanning posture that constantly reflects in the entrepreneurship construct definitions, one might not differ significantly by drawing a parallel on the premise that such a view merges the construct with the academic discipline of strategic management and SWOT (strength, weakness, opportunities, and threats) models (Thompson Jr. et al., 2005). Hence, this study adopts the view that entrepreneurship represents the composite activities of assembling creativity, innovativeness, and offering strategic leadership in all spheres of human endeavour to find solutions to a chaotic process. Thus, the ability to solve problems inherent in work systems, society, and personal life all represent entrepreneurial spirit in the context of this study - in short, finding equilibrium in a state of disequilibrium. Therefore, the entrepreneurship concept is broadened here to include individuals in the workplace who are providing adaptive solutions to challenges and creating wealth for the common benefit of all (social entrepreneurship).

Citing the spiral innovation engineered by the giants of Silicon Valley as an illustration, Chiles et al. (2007) support the subjective knowledge of the past and future expectations of entrepreneurs in pursuance of their interests and interaction with other entrepreneurial minds to unintentionally create newness and gain market shares without necessarily the intervention of a higher-order authority. Such admonishing coheres with Peter Drucker's (1985) position that the managerial science of planning, coordination, forecasting, environmental scanning, and strategic thinking are required skills for successful entrepreneurship execution and igniting strategic renewal (Hitt, Nixon, Hoskisson, & Kochhar, 1999). In the opinion of Giménez-Roche (2011),

entrepreneurialism deals with the social engineering of events with future implications for both social and economic benefits for wealth creation, employment, low-cost housing, community and employment benefits, and investments in pharmaceuticals. Argumentatively, incomplete knowledge and different kinds of biases inherent in individual personality or environment can also affect the perception of utility, adding to the complexity of understanding the phenomenon of entrepreneurial decision-making (Tversky & Kahneman, 1974; Minniti & Nardone, 2007; Schade & Koellinger, 2007).

For many of the conceptualisations of the entrepreneurship construct that made its way into this study, several more did not since the field is characterised by multidisciplinary scholars (Zahra S. A., 2005). Still on debates of diverse scholarship, the enterprise and economic views (Drucker, 1985; Venkataraman, 1987; Sieger, Fueglistaller, & Zellweger, 2011) have primarily dominated the entrepreneurship definition literature as well. However, many developing nations' economies seem dominated by informal sector activities (World Bank, 2013). Hence, understanding the dynamics of entrepreneurship from the informal perspective has been advocated. Williams and Youssef (2015, p. 150) submit that informal entrepreneurs comprised people "actively involved in starting a business or are the owners/managers of a business engaged in monetary transactions not declared to the state for tax, social security and/or labour law purposes, which is legal in all other respects". Williams and Youssef's description has similarities to the Ghanaian economy, with several economic ventures not captured in the tax net. Therefore, understanding how the Ghanaian informal sector's entrepreneurs use resources to generate income for family consumption could be of interest in future research. However, Williams and Youssef's view on what constitutes entrepreneurship has no such drastic variations from the

economists' models thus far (e.g. Schumpeter, 1934; Venkataraman, 1987). Overall, the struggle for legitimacy in deconstructing the entrepreneurship construct continues even with etic views from interested scholars in American literature, which are all plausible considerations (Fleischmann, 2006, p. 1).

Despite divergent publications in 2005 onwards, Wang and Jessup (2014: 177) acknowledged Shane and Venkataraman's (2000 and 2001) focus on the distinctiveness phenomenon in their earlier publications as essential milestones that achieve convergence for entrepreneurs in the entrepreneurship study. Indeed, Fleischmann's contribution to understanding entrepreneurship cannot be ignored with his perspectives on emancipation.

The stimulating question remains: How is Ghana fair on entrepreneurship competency development by its citizens based on empirical reports? However, offering the Ghanaian view on what constitutes the entrepreneurship construct is worth examining briefly. Drawing on his experience using a case study approach to teach entrepreneurship courses in a Ghanaian university, Kuenyehia (2012, p. 14) thinks that entrepreneurship is a process of "finding an idea that removes a customer's pain." Others have acknowledged that entrepreneurship success goes beyond offering goods and services to clients; it involves the science of management and the best human resource management practices to run an enterprise: a view consonant with Drucker's (1985) managerial perspective. Kuenyehia's conceptualisation of entrepreneurship reflects a marketing view that supports earlier views of a multidisciplinary field scholarship.

A recent Global Entrepreneurship Index (GEI) scores Ghana between 0.28 and 0.61 coefficients on five skills in a 2015 survey (Ács, Szerb, & Autio, 2015, p. 94). The skills are opportunity perception (.61), start-up (.20), risk acceptance (.36), networking

(.28), and capital support (.60). Other measures of the 2015 GEI score Ghana on technology absorption (.16), competition (.42), and extremely low on human capital (.07); product innovation (.12); process innovation (.18); high growth (.23), and going international with its entrepreneurship innovations (.17). Perhaps, such indices pose a gloomy picture for Ghana's economic growth and job creation in the knowledge age. The role of human capital in economic growth cannot be underestimated, yet a developing country like Ghana continues to perform poorly on such indices. Such weak performance in human capital development has led stakeholders in recent times to question the employability of Ghanaian and African youths (McCown, 2015).

Nevertheless, it is instructive to account for caveats in conducting cross-cultural comparative studies of entrepreneurship surveys due to structural variations and access to secondary data. Such caveats are echoed by entrepreneurship reviewers who intimate that international comparative studies of "entrepreneurship is rare, hampered by barriers such as difficulty in gaining access to entrepreneurs in other countries, high expense," and unavailability of reliable data (Mueller & Thomas, 2000, p. 53). Hence, country-specific findings on entrepreneurship construct with psychological and technology dimensions, such as those proposed in the current study, might offer hope for the African academy and guidance and counselling coordinators in Ghanaian higher education.

For analysis and discussion, the proposed operational definition offered in this segment reflects the factor analysed instrument used to measure the entrepreneurship construct in both a pilot and final data gathering where dominant traits retained with 90.13% of variance extracted with eight components loadings amongst Ghanaian public universities students. Thus, within the purview of the current study, *entrepreneurship represents the individual's social-cognitive capability to generate innovation geared*

towards solving personal or group needs with the engagement of managerial thinking for environmental scanning using technological tools to attain competitive advantage in formal or informal business sectors. By this expanded definition, the agent (entrepreneur) must consciously develop within the frameworks of the Theory of Planned Behaviour and social cognitivism. Hence, the views of economists (Schumpeter, 1934; Shane & Venkataraman, 2000), managerial thinking of Peter Drucker (1985), personal traits schools (Atef & Al-Balushi, 2014), social and technological entrepreneurial views (Oblinger, 2012) have all influenced the definition for this study within the theories of equilibration and disequilibrium.

Many management disciplines and geographical regions have cited the strategic impact of technology on social and organisational structures today (Carayannis & Turner, 2006; Funk, 2006; Lee & Song, 2007). Others projected the dyad image (*disruptive or evolutionary*) of entrepreneurship based on Schumpeter's definition as creative destructive innovation (Linton & Walsh, 2004), whilst Oblinger (2012) extols technology's dramatic impact on business in the knowledge society. Nevertheless, classical and neoclassic definitions of entrepreneurship seem to have explicitly glossed over the role of emerging ICTs in business engineering processes. From a strategic posture, Thompson Jr. et al. (2005, p. 71) highlight that "advances in technology can dramatically" change an industry's landscape, likely to affect the production of new goods and services and expansion into whole new markets. Thompson et al. also believe that colossal capital requirements, human resource expertise, new assembly lines, and business process altering all go with adopting competitive innovation whilst perfecting technology to broaden product distribution lines and gain customer acceptance. Based on such anecdotal views on significant changes technology brings to businesses, integration into the definition lines of entrepreneurship in this study should be

considered with the most substantial evidence from high-tech industries such as telecommunication, cable news networks, and e-commerce. In the views of some conservatives today, significant numbers of emerging jobs are technology-driven, and this requires today's graduates to develop technology integration literacy to enable them to become active participants in the 21st century and the world of work (Kerry et al., 2000).

While some definitions of entrepreneurship consider new business creations (e.g. Cantillon, 1755; Kirzner, 1997), the powerful utilisation of technologies for goods and services has received silent mention in the entrepreneurship literature. Spencer et al. (2008: 15) also amplified the quiet mention of technology's role in entrepreneurship literature. Evidence still shows little attention has been received (Spencer, Kirchoff, & White, 2008: 16) from the entrepreneurial studies so far. Therefore, the current study extends the existing entrepreneurship definition to include technological tools for formal or informal sector venture creation that would achieve competitive advantage in the context of blurred boundaries of new industries due to rapid shifts in technologies and new market opportunities for entrepreneurial innovations (Thompson Jr. et al., 2005, p. 148).

Secondly, the current works of Weiner, Geldhof, and Lerner's (2014) and Drucker's (1985) conceptualisation of entrepreneurship provide another leverage for the proposed definition in the current study on students' entrepreneurship propensity. Drucker's view that managerial skills are prerequisites for entrepreneurship development aptly positions the current study amongst business students in Ghanaian public universities, with Weiner et al. conceiving entrepreneurship initiatives as comprising six core managerial innovative activities – *selection, optimisation, compensation, loss-based selection, entrepreneurship activities, and entrepreneurship*

career value. *Selection* activities involve individual strategic choices as to which ventures they are likely to pursue, whilst the *optimisation* criterion deals with decision-making to maximise the strategic decisions made in new or existing venture creation with personal traits such as perseverance, resistance, diligence, and risk-taking propensity. The traits approach focuses on matching individuals to jobs and assessing the impacts of socio-cultural factors on the strengths and quality of youths' career choices (Lopez & Edwards, 2008).

Weiner et al. also account for entrepreneurs planning alternatives when their selected and optimised choices face danger, and they called these elements *compensation* and *loss-based selection* that guide business operations. Finally, how the youth set out to concretise their selection activities by engaging in programmes such as club membership, start-up planning, and new products and services design are labelled as *entrepreneurship activities* with their career choices that would enable them to exhibit entrepreneurship intentions called *entrepreneurship career value*.

Whichever angle one sees the entrepreneurship decision-making, it is more of a process or risk-taking, ideas generation, resource allocation, production of goods and services with value addition and enterprise-driven (Ireland & Webb, 2007; Weiner, Geldhof & Lerner, 2014; Kuenyehia, 2012). The characteristics of the samples (final year undergraduate students with an average age of 24.86 ± 4.01 (*SD*)) used in this study (see Section 3.3) fall within Wiener et al.'s classification of youth, thereby providing ample justification for measuring the six elements of entrepreneurship career choice in this study as well (see Section 3.7). Even though such definitions offered for data examination in this study might not be far-reaching enough, they would undoubtedly spark conversations about other things, such as the impact of combining production resources for entrepreneurial ventures in the African context.

Arguably, Africa is constrained by low technology penetration and ICT skill gaps, thereby widening the digital divide. This study also asks: what digital technology competencies are Ghanaian students developing from their institutions? Are these competencies adequate to wedge into their nations' productive sectors, taking advantage of social factors, energy production, cutting-edge education, cultural, and economic volatilities in the Ghanaian economy? This sharply brings to mind the classical economic views of the entrepreneurial process alone, which might not be able to account for such lingering questions raised by the current study. Maybe integrating Western knowledge with indigenous African knowledge systems could offer a glimmer of hope for the Ghanaian youth leaving university today while simultaneously building the capacities of many non-formal sector workers in the Ghanaian economy.

2.1.15 Elusive Question: Are Entrepreneurs Made or Born?

As the identity battle of the entrepreneurship field continues, the ubiquitous “*born or made entrepreneurs*” discussion cannot elude the attention of critics, just as the “*nature vs. nurture*” controversy in the field of psychology. Contributing to such debates on why some dreams see the light of day, Shefsky (1994) acknowledges that the dreams of many are often shelved simply due to procrastination and myths about fear of failure. Citing facilitating conditions, requisite skills, and reduced risk of failure for entrepreneurship to take off in his book *Entrepreneurs Are Made Not Born*, Shefsky submits that entrepreneurs are made and not born in his most provocative claim. Badal (2010) submits that proponents of the “born” [nature] position admit that certain personality traits form substantial aspects of entrepreneurial activity. Hence, individuals who demonstrate intense personality attributes are more likely to be interested in new enterprise creation and are highly likely to be successful. Bandal concludes that academics favouring the “made” [nurture] perspective hold that

environmental determinism is the key to the entrepreneurial process with the conviction that people can be trained to be entrepreneurs (a behaviourist view).

Historically, any attempt to debate “nature vs. nurture” issues can be considered a typical proverbial egg and chicken story in developmental psychology (Shaffer & Kipp, 2007, p. 44). It is not within the remit of the current study to be drawn into such a meandering resolution. However, the debate on the traits approach to defining the entrepreneur’s career choice and those on the creative process (Schumpeter, 1934; Kirzner, 1979; Gartner, 1988; Low & MacMillan, 1988; MacMillan, 2007) hold a parallel to the “born or made” view of the entrepreneur. Some current empirical research demonstrates the existence of genetic traits are more likely to increase the probability that off-springs of business owners more than those of non-business owners are likely to be entrepreneurs (Lentz & Laband, 1990; Dunn & Holtz-Eakin, 2000; Hout & Rosen, 2000); supporting the “nature argument”. Also, 48% variance in entrepreneurs’ careers has been supported by genetic factors in a finding of monozygotic (identical) and dizygotic (fraternal) twins, with 52% attributed to non-shared environmental factors and measurement errors (Nicolaou, Shane, Cherkas, & Hunkin, 2008). Nicolaou et al.’s genetic finding could be debated within the SCCT, as well as socio-cultural and social-cognitive views on entrepreneurial career choice submitted earlier in this chapter.

Cox (2002) also alludes to environmental determinism, which suggests that entrepreneurial behaviour can be encouraged because most people have some traits associated with this type of behaviour in a population of interest. Despite such reports on the traits models, this study believes that meta-analysis might be required to validate such findings for a more vigorous debate in favour of the ‘nature’ of entrepreneurs. Perhaps the field of biopsychology is needed to validate the genetics propositions

(Nicolaou, Shane, Cherkas, & Hunkin, 2008). Until then, the biological arguments on entrepreneurs' traits remain a perception that lacks empiricism beyond accidental occurrences. However, drawing on scientific knowledge from the fields of human resource development using cognitive science (psychology), this study humbly adopts the "nurture" posture that humanity (not a bias against feminism, though) can be guided to achieve its full potential in today's knowledge economy spurred by constant technological innovations and increasing creativity. Hence, environmental determinism could be a cornerstone for career guidance, counsellors, and strategic human resource management practitioners when integrated with the Ghanaian indigenous knowledge systems.

Appraising the uniqueness of entrepreneurs as critical thinkers, innovative-driven, driven, and strategic business-minded has received its fair share of the debates in entrepreneurship writing. Aldrich and Zimmer (1986) pointed out that individuals do not make decisions in a vacuum. Instead, they consult and are influenced by significant others in their environments, such as friends, family members and loved ones, co-workers, employers, casual acquaintances, etc. Supporting the interactionist view on entrepreneurs, significant others point out from several studies examining social capital and networks as vital resources (Lee & Jones, 2008; Georgiou, Dodd, & Andriopoulos, 2013; Jansen, Curseu, & Vermeulen, 2013). In addition, Granovetter (1985) also thinks that entrepreneurs do not operate in isolation since they constantly need social engagement to meet human needs through creative ventures. Such social considerations appear to support the heterogeneity of scholars dominating the entrepreneurship field.

In adherence to Bygrave's (1989a) view to borrow theories and methods from adjunct scientific fields, this section attempts to position the thesis statement of this study within the current and existing genealogy of knowledge in the field of

entrepreneurship career decision-making. Multiple models in psychology, human resource management, and technology are explored in the Ghanaian students' entrepreneurship case. In support of the position to transfer methods and theories from technology, psychology, and management science in this study are Johannisson and Senneseth (1990) and Stevenson and Harmeling (1990). Stevenson and Harmeling argued that entrepreneurs and managers need a more chaotic theory since many present theories explaining corporate entrepreneurship are based upon a couched assumption of equilibrium-disequilibrium events. Johannisson and Senneseth also point out the inherently ambiguous nature of entrepreneurship concepts and efforts to create a consensus model to explain it would be an exercise in futility. The two arguments highlight the need to employ multiple theories and methodologies for exploring the concept. Hence, high grand theories of cognitivism, concern-based adoption model, Ajzen's Theory of Planned Behaviour, and anti-colonial and critical education theories underpin the current attempt to predict variances in students' entrepreneurship propensity in Ghanaian public universities. The adopted high grand theories discussed upon the provision of contextual definition (see Section 2.1) of the entrepreneurship concept provide the framework for this study. In conclusion, continuous and steady exchange of ideas amongst diverse scholars (e.g. Gartner, 1988; Bird, 1988; Shane & Venkataraman, 2000; Ireland, Hitt, & Sirmon, 2003; Lazear, 2005; Anderson & Starnawska, 2008; Oosterbeek, Praag, & Jsselstein, 2008) with emerging academics joining the fray would enrich debates towards scholarly recognition and increasing legitimacy of entrepreneurship phenomenon.

2.1.16 Technological Impacts on Entrepreneurship and Employment

Increasing disruption, high volatility, and growing diversity have dominated market indices in many sectors (formal and informal), including retailing, information

technology, healthcare, education, pharmaceuticals, and host of others (Chiles, Christopher, McMullen, Bierman, & Greening (2010: 8). To some, a singular solution that can provide jobs on large scale for teaming unemployed youths lies in a combination of innovation and entrepreneurship (Ács, Szerb, & Autio, 2015, p. 1). In a cautionary tone, some have implied that realising Schumpeterian's model of entrepreneurship, which hinges on societal innovation, would be a delusion without technological entrepreneurship (Francoise & Janviere, 2016, p. 298). Nevertheless, under what circumstances does entrepreneurship strive? In Hansemark's (1997, p. 28) views, conditions of skyrocketing unemployment rates might motivate individuals to commence their enterprises "as a means of subsistence" within the context of more prominent social and business indicators. Therefore, the management literature has discussed the role of information and communication technology in altering job processes, which has been addressed in the management literature (Laudon & Laudon, 2007). Such innovations on the technology front have been expressed in curriculum reforms in different countries. For instance, in an executive summary of Professor Anamuah-Mensah's 2007 Education Commission Report, Ghanaian public universities are mandated to re-examine their programmes because of advances in knowledge and changing demands in the economy to producing highly competent human resources capable of spearheading industry and commerce (Ghana's Education Reform Report, 2007).

The International Society for Technology Education (ISTE) is a leading non-profit organisation that promotes technology to support instructional delivery at both pre-university and university levels in the USA in collaboration with the National Council for Accreditation for Teacher Education (NCATE) over decades (Shelly, Cashman, Gunter, & Gunter, 2006). Another body the ISTE manages is the National

Educational Technology Standards for Students (NETS-s). The standard for students seeks to evaluate students' technology integration literacy in six broad categories. These include (i) basic operations and concepts, (ii) social, ethical, and human issues, (iii) technology productivity tools, (iv) technology communications tools, (v) technology research tools, and (vi) technology problem-solving and decision-making applications. Educationists are increasingly advocating for standard-based learning and assessment that empowers learners to function in specialised fields and geographical settings (McMillan, 2007). Whilst fanatics such as Popham (2005) are vociferous on the ideals of standard-based education as most likely to empower students' learning much better than curriculum-based learning across states, McMillan further submits that different educational leaderships play key roles in setting the boundaries of what students should know and which competency frameworks are required after graduation. Though Ghanaian education has no standard-based education policy, the 2007 Education Commission Report chaired by Jophus Anamuah-Mensah recommends universities integrate ICTs into instructional delivery. The Review Committees' recommendations came at the heels of the ICT for Accelerated Development Policy (ICT4AD), which also identifies the need to incorporate ICTs into educational delivery in Ghanaian schools for accelerated national development (The Republic of Ghana, 2003). As part of the 2003 Policy's mission, it submits:

... to transform the educational system to provide the requisite educational and training services and environment capable of producing the correct type of skills and human resources required for developing and driving Ghana's information and knowledge-based economy and society, the Government is committed to a comprehensive programme of rapid deployment, utilisation and exploitation of ICTs within the educational system from primary school upwards (ICT4AD Policy, p.37).

Contextually, the *ICT4AD Policy*'s admonition merges with the 2007 Education Reform, which has stated the embers of Ghana's education philosophy in the knowledge economy. The philosophy, amongst other things, states that the underlying theme for Ghana's education should be the training of well-balanced (intellectually, spiritually, emotionally, and physically) scholars with requisite skills, knowledge, abilities, values, aptitudes for self-fulfilment and socio-economic and political transformation of Ghana. Conversely, global economic challenges and weak economic indices of Ghana's employment market are of concern (Aryeetey & Baah-Boateng, 2007). Ghana's graduates leaving school are expected to develop the requisite entrepreneurial competencies to make significant contributions to organisations and nation-building efforts with the potential for ICTs in the information society. Sadly, these graduates are instead critiqued by industry players as lacking working experience and knowledge for today's knowledge society- a society characterised by the constant transmittal of information using digital technologies where some argue that the proliferation of visual media would eventually alter learning paths of today's learners and projected that cognitive processing would also grow exponentially (Winslow, 1996). Consequently, this segment justifies examining the technology integration competency of graduating business students from the sampled public universities in Ghana for job creation.

The role of entrepreneurship activities in the growth and expansion of nations has been highlighted by economists and politicians alike. For instance, Spencer, Kirchoff, and White (2008) suggest that entrepreneurs and their engagements enhance competitiveness, create employment, stimulate the economy, and create new wealth for distribution, thereby promoting capitalism. Though entrepreneurship has been hailed as a conduit for wealth and resource reallocation, classical economists such as Marx and

Engels (1845) and Schumpeter (1934) hold the view that capitalism has been heavily critiqued as wealth concentration is seen in the hands of a privileged minority. Despite socialists' dimed view of wealth distribution, entrepreneurship is increasingly recognised as an essential generator of growth, innovation, and new job creation (Baumol, 1968; Wennekers & Thurik, 1999; Van Stel & Caree, 2004). A nation's wealth and growth largely hinge upon the competitive edge of its formal and informal businesses, and this, in turn, relies fundamentally on the capabilities of its entrepreneurs and managers with essential determinants of entrepreneurial activity that include the availability of transportation, telecommunications networks, and reliable energy supplies (Baker, Gedajlovic, & Lubatkin, 2005). Entrepreneurship commentators, researchers, and business analysts have begun to apply Schumpeter's 'creative destruction' to the study of existing and emerging technologies with attention on how companies can avoid the decline associated with creative destruction witnessed in the high-tech industry (Christensen & Raynor, 2003; Laudon & Laudon, 2007).

Indeed, entrepreneurship is at the heart of technology innovation-led economic development (Smith, Glasson, Romeo, Waters, & Chadwick, 2013). In a study of high-technology-based firms, others identify the lack of motivation and confidence in society as a negative variable for entrepreneurial change and propose that entrepreneurial skills and motivation could be created through education (Utterback & Reitberger, 1982). Hence, Hansemark (1997) points out three approaches (a social psychological, a psychoanalytical, and the trait) have been suggested to ignite such confidence and motivation. Scherer, Brodzinski, and Wiebe (1991) relate entrepreneurship and social psychological models as the assumptions, social habits, and conventions that affect individuals' choices. Consequently, entrepreneurial role models influence individuals' attitudes toward entrepreneurship. Similarly, others relate entrepreneurship intent to the

psychoanalytical model as how experiences in early childhood constitute a decisive predictive factor for an entrepreneurial propensity when the person becomes an adult (Kets de Vries, 1977). Whilst the current study acknowledges the immense contributions of such psychological approaches to explaining entrepreneurship intention, it departs from the minimalists' methodologies. It adopts maximalists' views with cognitive-based models as the theoretical framework for predicting students' entrepreneurship propensity towards job creation in the knowledge economy. Trait models for predicting job creation have been extensively discredited (Gartner, 1988) and shown limited success as ambivalent and inconclusive, with weak correlations between the assessments of the trait and actual entrepreneurship intention (Chell, 1985).

Commenting on the dynamic contribution of entrepreneurship intention to job creation and economic development, Atef and Al-Balushi (2014) reported that many Omani youth preferred working in the government sector to job security rather than in private firms. Indeed, entrepreneurship intentions determine how quickly and accurately an economic system identifies and responds to the profit opportunities inherent in disequilibrium situations. Thus, it (private & public) generates greater coordination of economic activities at a point in time and increases the economy's growth rate over time. The desire of businesses and nations to create wealth hinges on promoting entrepreneurial skills and competencies through educational programmes as well. Surely, governmental support [the regulatory framework of a country's taxes, regulations, and confidence in public institutions) that affects entrepreneurial activity has been highlighted as a conduit to enhance or restrain entrepreneurial activity (Kristiansen, 2001). Commenting on governmental policies supporting entrepreneurship and job creation, Gallup shows a significant association between satisfaction with public institutions and the likelihood of start-ups with an unfavourable

report on how corruption perception amongst citizens influences intent to start a business (Badal, 2010, p. 8). Because of wealth creation, it has been observed that several writings are now giving increasing recognition and the need to develop a more profound understanding of the strategic competencies that facilitate the work of entrepreneurs as well as engaging the attention of techno-entrepreneurs and academics (Spencer, Kirchoff & White, 2008; Tajeddini & Mueller, 2009). Hence, academic institutions have a considerable challenge developing core expertise, 21st-century skills, and digital knowledge for formal and informal entrepreneurial-driven growth sectors. Therefore, universities must be concerned with the number of critical entrepreneurial competencies their students acquire.

Despite considerable controversies regarding the number of entrepreneurial competencies identified in the scientific literature, Rezaie-Zadeh et al. (2014) provided a comprehensive list of entrepreneurial skills in the scientific literature that would also be relevant for techno-entrepreneurs. Three major themes emerged from their work. The themes are *psychological* (e.g. goal-setting, locus of control, extraversion, creativity, risk-taking, need for achievement, decision-making, self-confidence, stress, and failure coping), *management* (motivation, leadership, risk perception, vision, communication skills, conceptual skills, autonomy, and financial management), and ICT proficiency, and job skills (e.g. practical work experience, & market analysis). Other entrepreneurship traits such as emotional, motivational, cognitive, and interpersonal competencies essential to successful entrepreneurs from twelve valued skills also surfaced in Rezaie-Zadeh et al.'s work. Similarly, determination, ability to make decisions, questioning everything, communication, ingenuity, and competitiveness is their study's top six influential entrepreneur skills. Equally, Jain (2011) examined entrepreneurial competencies and laments. Despite numerous

research works on why, when, and how entrepreneurs are discovered, intensive inquiry is still needed to explore both intrinsic and extrinsic variables related to entrepreneurs. Jain's work confirms research covering various motives, personal traits, psychological characteristics, and self-efficacy as components relating to entrepreneurs' attitudes, intentions, and behaviours.

Undeniably, technological innovations' life span is becoming shorter today, putting pressure on businesses (Thompson Jr. et al., 2005) and human resource development practices (Armstrong, 2003; Mathis & Jackson, 2011; Fitz-enz, 2010). Indeed, technology is a game changer for business, education, and all industries (Oblinger, 2012). In the high-tech world, organisations today are experiencing tremendous change due to new technologies, rapid discoveries of knowledge, globalisation of businesses, and the development of e-commerce as spurred by the Internet. More importantly, the emergence of information and communication technologies (ICT) has also altered business processes with significant organisational reengineering. "Key corporate assets – intellectual property, core competencies, financial, and human assets are being managed through digital means" (Loudon & Loudon, 2007: 7). These phenomena have created hyper-competition for firms on a global scale with highly skilled human resources needed to meet the needs of digital firms today; a view shared by career development experts as well (Sullivan & Baruch, 2009). Similarly, writers in human resource management also highlighted computerised information systems for managerial decision-making. Undeniably, Jain's (2011) proposition that entrepreneurship is no longer a preserve of equity owners is justified within the context of enormous technology innovations altering jobs.

The relatively short life spans of technologies create panic and fear for businesses. However, it will require ingenious and creative minds in organisations and

society to identify entrepreneurial opportunities to exploit the disequilibrium created by technology-craze innovators. Perhaps these innovative minds reside in the young graduates from today's universities and colleges. University students' technology integration literacy would be required to contribute significantly to business activities in the information society. Alfred Marshall, a 19th-century economist, began to realize the importance of knowledge and recommended, "Knowledge is our most powerful engine of production," with firms as facilitators of growth (Cader, 2008, p. 118).

The competencies of students leaving universities today require more than reading literacy, as the CEO Forum on Education and Technology (2001: 1) summarises in a publication titled *Key Building Blocks for Student Achievement in the 21st Century* - the definition of students' achievement must be broadened to include 21st-century skills that students will require to thrive in the future. The world in which our students live is significantly different from that of yesterday. Thus, 21st-century skills should be considered within rigorous academic standards. They are bridges to students' authentic, intellectually challenging works with ICT tools. The desired skills employers seek are the embodiment of technology literacy, innovative thinking, creativity, collaboration, economic and social literacy, high productivity, and practical communication skills. Based on a review of the entrepreneurial career choice literature emphasising graduates' 21st-century skills, it is legitimate to ask, are they equipped with 21st-century skills for critical thinking, digital innovativeness, team spirit, information literacy, technological proficiency, and strategic thinking, coupled with the proper psychological dispositions to take make significant contributions to personal and societal development in the future?

We are in the digital age with emerging twists to traditional entrepreneurship. Today's learners employ handheld devices, instant messaging, and smartphones to

connect to friends, family, and subject matter experts and communities worldwide. Active participation in the information-rich economy requires diverse ICT skills in the Internet, social media, and digital creations (Shelly et al., 2006). Business processes are being digitised with enterprise solution systems on an increasing basis (Pratt & Adamski, 2005). Therefore, our students will require extraordinary entrepreneurial competencies to innovate and re-engineer businesses for wealth creation.

Indeed, the emergence of the digital age has prompted Laudon and Laudon (2007:7) to refer to business entities using computer technology to manage their strategic functions with suppliers, customers, and employees as digital firms. The concept of digital firms implies that organisations' recruitment policies would essentially depend on strategic human resource management activities. For instance, employee recruitment would depend on questions such as how technologically savvy organisations are in terms of existing and prospective labour in digital technologies in today's information-rich society. Similarly, today's businesses would want to know if graduates leaving universities would be able to create new knowledge using digital means. Knowledge creation is also one reason technologists describe the digital age as a knowledge economy (Shelly et al., 2006; Oblinger, 2012). These and other interrogatives would determine how university graduates compete in the digital age.

Captivatingly, management information system experts reported that American businesses spent 1.5 trillion dollars on the acquisition of computer hardware, software, and technology consultancy services (Laudon & Laudon, 2007:5). Other developed and developing countries continue to invest in the acquisition of information and communication technologies (ICTs) to facilitate business processes. New technologies result in job redesigns, human resource development, and continuous learning by employees to ensure returns on investment (Phillips & Whalen, 2000). In the wake of

technological innovations workplaces are witnessing, educational reforms recommend ICTs in preparing students for the knowledge economy (Ghana's ICT4AD¹ Policy, 2003). Likewise, an investment in ICTs by educational institutions has been reported in the ²Education Sector Performance Report 2010 (pp.71-72). The report indicates that 87% of second-cycle schools in Ghana have computer laboratories, and 97.4% reported having ICT teachers. Indeed, the 2010 report is an excellent case for examining technology access in Ghanaian schools. However, studies have shown a mismatch between access and integration literacy in Ghanaian universities with low technology competencies (Yidana, 2007).

Institutions increasingly recognise the significance of computer technologies in preparing graduates for jobs today. Universities have also taken up the challenge of providing ICT education across curricula. This often comes with introducing ICT core courses and subject-specific ICT education. However, we are not confident that these vast investments will yield results that will prepare our business education students to integrate ICTs into business engineering. Hence, this study seeks to inquire whether students leaving Ghana's tertiary business schools have the skills to provide entrepreneurial leadership with ICT integration literacy. Commenting on facilitating conditions for entrepreneurship activities, Baumol (1990) draws attention to rules governing innovative creation and the structure of one's economy. Therefore, the emergence of ICTs has some cascading effects on start-up enterprises or creative thinking by individuals within an economy (Spencer, Kirchhoff, & White, 2008). Hence, this study intends to explore the concept of entrepreneurship amongst Ghanaian

¹ National ICT for Accelerated Development Policy, Government of Ghana's framework for ICT deployment, 2003.

² This is an annual review document by the Ministry of Education, Ghana to provide opportunity to stakeholders in education to evaluate the education sector's performance.

public undergraduate students with cognitive and demographic traits in a discriminant analysis using a pragmatist's epistemology. Thus, the students' perceptions of entrepreneurial concepts and curriculum experiences are explored quantitatively and qualitatively (see Sections 4.1.12 and 4.2.1).

2.1.17 Students' Entrepreneurship Intentions Studies

This section reviews the main factors explored in the theoretical and conceptual framework guiding the study (Figure 1) and scientific publications on related works that precipitate the current research. The main characteristics, such as entrepreneurship, social-cognitivism, technological, and demographic factors, are discussed using a thematic approach to the literature review. Themes allow the discussions of cases and issues in scientific inquiries (Creswell, 2012). Discursive discourse analysis is also employed to investigate themes raised about entrepreneurship activities.

Africa has been reported to witness high levels of entrepreneurship enthusiasm, yet weak empirical supports exist that such levels enhance economic emancipation in the Sub-Saharan region (Schaumburg-Müller, Jeppesen, & Langevang, 2010). Schaumburg et al. believe that many African entrepreneurs do not become entrepreneurs by choice or because they take advantage of an opportunity but out of difficulty finding "wage employment and do not have any other source of income." (p. 4). However, one limitation of entrepreneurship studies is their lack of predictive power. Thus, the intention of individuals to undertake entrepreneurship tasks has been left to historians rather than empirical thinkers with the power to forecast the careers of young ones. Consequently, the current study sought to build multivariate models to account for social-cognitive, technology integration literacy, and demographic factors in Ghanaian business students' entrepreneurial intents in the knowledge society.

Empirical results of personality traits (individual factors) predicting

entrepreneurship intention are found in studies involving students. For instance, except for the need for achievement, students' locus of control has been reported as having a statistically significant association with entrepreneurial intention and learning achievement amongst Indonesian economics students (Thaief, 2015, pp. 800-801). In the African context, Fagbohunge (2012) reports a non-significant correlation between locus of control and entrepreneurial ability with 668 university students from the Western part of Nigeria. In addition, Fagbohunge's finding on gender roles aligns with the views of Baron et al. (2001) that males and females did not score differently on entrepreneurship intents. Similarly, gender has been reported as having no statistically significant relationship with entrepreneurship (Ayodele, 2013).

In a comparable finding to Fagbohunge (2012), Ayodele shows that entrepreneurial self-efficacy, locus of control, and socioeconomic status predicted adolescents from Ogun State (Nigeria) entrepreneurship intents. Statistical reports on individual factors predicting entrepreneurs must be explained within cultural and institutional contexts. Perhaps, with earlier works of Jain (2011) and Schwenk and Shrader (1993) on meta-analysis, entrepreneurship researchers might need more studies to evaluate effect sizes for standardised reporting of personal traits such as gender. Additionally, Rauch and Frese (2000) suggest that personality variables emerged strongly in the entrepreneurship literature that do not lend themselves to ecological validation due to the dominant studies in the Western academy.

Characteristically, several global research works tend to ignore the African case of entrepreneurship intention (*e.g.* Geldhof et al., 2014). A Global University Entrepreneurial Spirit Students' (GUESS) index analysis on two central questions (how seriously are students thinking about founding a firm and what steps they had already taken) showed that UK, Estonia, and Portugal business students had the highest

entrepreneurial intention with the least entrepreneurial power observed in Japan, Greece, Pakistan, and Germany (Fueglistaller & Zellweger, 2011). The GUESS Report also reveals similarities between natural science and social science students, with business students showing a slightly higher mean score of 12.8 than science students (Mean 12.6). However, the report did not establish a statistically significant difference between science and business students' entrepreneurship intentions with only South African participation, ignoring Sub-Saharan African universities. Finland and South Africa had the most entrepreneurial students, with Pakistan, Belgium, Greece, and Japan scoring the least entrepreneurial intent. The survey also ignored the case of African universities in the 2011 survey.

However, using 148 students from 20 universities in China to explore entrepreneurship intention in 2003 amongst final-year students established that students' personal beliefs and self-capability greatly influenced their decision to become entrepreneurs (Jinying & Pelagie, 2014). Professor Jinying and his students also reported favourable institutional environments in the participants' home countries. These environments had a significant influence on students' entrepreneurial decision-making. Jinying et al.'s report supports the institutional researchers' approach to exploring entrepreneurial vocation (Acemoglu, Johnson, Robinson, & Thaicharoen, 2003).

Another relevant empirical study on entrepreneurship study projects Ghana as weak in facilitating conditions such as human capital, technology infusion, competitiveness, and risk-taking with the 105th position amongst 130 nations (Ács, Szerb, & Autio, 2015). Findings from such studies aptly provided intellectual analysis for the current work based on the interview and survey data measuring graduating students from Ghanaian public business-oriented universities.

2.2. Managing Protean Careers in the Knowledge Economy

Careerists' continuous lamentations on unpredictable jobs today have led Sullivan & Arthur, 2006 to comment on boundary-less careers that today's youth must circumvent. Technologists attempt to explain the protean careers in firms with sophistication in technology (Oblinger, 2012; Laudon & Laudon, 2007) that some futurists designated the current age as the post-industrial society, information society or society of knowledge (Watts, 1998; Tractenberg, Streumer & Zolingen, 2002). A poignant view on the fast-changing world has been offered by Powell and Snellman (2004, p. 199), "Our understanding of the purported knowledge economy remains rather hazy, clouded by both enthusiasts and doomsayers who are quick to offer labels and assessments without much attention to evidence." Powell and Snellman were quick to add that despite the lack of empirical findings in support, technology enthusiasts still project fantastic growth in the industry because of changes in technology and information processing. Using an economics lens in *The World Bank Working Paper Series*, Chen and Dahlman (2005) also identified the global economy's key growth sources from knowledge applications in entrepreneurship and innovation, R&D, computer-assisted designs, and inimitable human resources. The OECD (1996) also highlights, "the role of knowledge (as compared with natural resources, physical capital and low skill labour) has taken on greater importance. Although the pace may differ, all OECD economies are moving towards a knowledge-based economy." The trials of the knowledge economy thus offer a clarion call to career and vocational experts in low-economic-income countries to watch possible influential variables likely to predict youth's career choices today. According to Ahunanya, Ibiama, and Okere (2011), transformative and specialised knowledge should be created through data. Because of multiple probabilities attributed to the implications of the knowledge society,

multivariate modelling techniques could be apt in predicting career decision-making in educational settings, which is an essential purpose for the current study.

Historically, in his 1969 landmark piece, *The Age of Discontinuity*, Peter Drucker was the first to use the phrase ‘the knowledge economy’. Subsequently, in the 2001 bulletin of the Economist, he offered a futuristic perspective on the knowledge economy as a key resource. He projected knowledge workers would primarily dominate that nation’s workforce. Similarly, certain historical milestones, such as the fall of the Berlin Wall in 1989, the launch of the Web browser- Netscape in 1985, and the launch of the biggest intelligent search engine, Google, provided ample shreds of evidence for Drucker’s hypothesis. Professionals from diverse fields seem to have approached its definition differently. Perhaps replacing the earlier economic models of mass production with the ‘new economy’ of the post-industrial epoch with a tremendous transformative force affecting industries, nations, and individuals also generated fashionable labels to rap around the new concept. Farkas and Török (2011:67) describe four broad labels associated with the new economy. They are the information economy/society, network economy/society, knowledge economy/society, and learning economy/society.

What, then, is the knowledge economy? Arguably, just as multiple labels are attributed to it, several traces of change models can be seen in the definition of the new economy. For example, a 1998 DTI Competitiveness White Paper states,

“... one in which the generation and exploitation of knowledge has come to play the predominant part in the creation of wealth. It is not simply about pushing back the frontiers of knowledge; it is also about the most effective use and exploitation of all types of knowledge in all manner of economic activity” (DTI Competitiveness White Paper,

1998).

Six main themes can be described from career developers' perspectives on diverse views associated with the knowledge economy. They include task orientation, autonomy, innovation, TQM, lifelong learning, and cost implications (Farkas & Török, 2011, p. 68). Career commentators agree that technical communication, cognitive-based, technical astuteness, and human skills are needed for the knowledge economy. Recently, Bidshahri (2017), the Founder & CEO of 'Awecademy', an online platform for youth to connect, learn, and contribute to human progress through virtual communities, enumerated seven valuable competencies that organisations will demand. Her arguments are based on the assertion that work process automation coupled with unprecedented accelerating changes from high-tech industries. Cognitive-based skills (*curiosity and imagination; critical thinking and problem-solving; agility and adaptability; initiative and entrepreneurship*) dominated her list, followed by human relationship skills (*effective oral and written communication; collaboration across networks and leading by influence*) and technical capabilities (*assessing and analysing information*). Though Bidshahri's propositions remain anecdotes, lacking empirical basis, her conclusion that schools should teach learners to ask questions rather than answer them is significant, given dominant cognitive-based skills for future works.

However, Lingerfelter (2012: 9) summarises Drucker's view of the knowledge economy - borderless, upward mobility and potential for massive success and failure for individuals and societies. Perhaps Drucker overlooks the implications of entering the knowledge economy with skills gaps for employees and prospective job entrants, with many nations' economies heavily reliant on raw materials, weak production bases, and low levels of human resource capacity, particularly in Africa. In addition, competing in the knowledge economy requires a high calibre of university graduates

who would be engaged in deploying the potential of computer technologies to reengineer business processes (Loudon & Loudon, 2007). Career guidance and counsellors in higher education should be watching this space – challenges of knowledge society- for proactive service delivery that meets young graduates' needs and career choices.

Whilst social scientists and commentators celebrate the productivity-oriented knowledge economy, Powell and Snellman (2004, p. 211) describe its dark side as distributional consequences. Indeed, the knowledge economy literature has consistently highlighted the implications of the knowledge economy for skills mismatch, job design, employees, production, the competitiveness of nations, manufacturing, marketing, job security, wage distribution and education (Morris & Western, 1999). For instance, regression models used to explain the achieved economic growth of national economies in the knowledge society painted sorrowful affairs for low-income countries on monetary incentives, solid institutional regimes, innovation, intellectual property protection, number of highly skilled workers and scientists, retention of skilled labour, and investment in R&D indicators (Sundać & Krmpotić, 2011, p. 120). Sundać and Krmpotić linked the weak performances of developing countries in the knowledge economy to 2008 Transparency International's (2008) *Corruption Index Report*, which identified widespread corruption and unstable political systems due to wars and revolutions. Based on the foregoing, Africa can compete favourably with the West in the knowledge economy by investing in its human resources R&D to inform its environmental variables and Indigenous knowledges instead of imitating others and building strong political structures that value innovation and intellectual property rights. Hence, the use of factor analysis in the present study to explore contextual variables informing Ghanaian business students' unique cognitive traits, technology integrations,

and entrepreneurial intentions could offer broader implications for curriculum designers, career developers, strategic human resource management, and policy analysts.

2.3. Theoretical and Conceptual Framework of the Study

Academics often call for developing hypotheses and models to advance scientific knowledge, and career choices are not new (Cook, Beckman, & Bordage, 2007; Cook, Bordage, & Schmidt, 2008; & Wolf, 2004). Similarly, Jain (2011) believes that multivariate statistical models provide a key to expanding the frontiers of entrepreneurship research. Earlier, marketing professors (Hair, Jr. et al., 2006) submitted that multivariate techniques posed the potential to decipher human behaviour. Everitt and Hothorn (2011: 1) also mentioned that multivariate data analysis models are “ubiquitous” amongst psychologists and many other behavioural scientists who often work with several cognitive variables.

Surprisingly, an absence of multivariate techniques in the entrepreneurial career choice literature has been observed (Jain, 2011), except for an attempt by Rauch and Frese (2000) to account for successful entrepreneurs, now referred to as *The Giessen-Amsterdam Model*. The Giesseb-Amsterdam Model is described as a multidisciplinary approach to predicting entrepreneurs' careers' success with personality, goals, human capital, strategies, and environment matched against success to give the model such eclectic predictive power. However, Rauch and Frese quickly acknowledge that empirical support to explain the constructs in the model is absent in the entrepreneurial career literature and cautioned researchers when adopting the Amsterdam Model.

Hence, Figure 1 illustrates the proposed conceptual framework for this study using multivariate techniques to hypothesize the predictive power of business students' cognitive-based traits in employment management in the knowledge economy. The

current model in Figure 1 integrates entrepreneurship literature (e.g. Leibenstein, 1968; Bygrave & Hofer, 1991; Amit & Muller, 1994; Chiles et al., 2007; Ahl & Marlow, 2012; Weiner, Geldhof, & Lerner, 2014; Geldhof et al., 2014) with theory (e. g. Rotter, 1966; McClelland, 1986; Ajzen, 1991) to develop the conceptual and theoretical model to guide data collection, analysis and discussion in this study. Social-cognitive theories provided the framework for studying the psychological predictors of students' entrepreneurial competency in this study as reflected in the entrepreneurship literature (e.g. Schumpeter, 1934; Drucker, 1985).

Specifically, five social-cognitive theories were applied to interpret business students' entrepreneurial competencies. These are goal-setting (Locke & Latham, 1990), self-efficacy (Bandura, 1982), locus of control (Rotter, 1966), need for achievement (McClelland, 1961), risk-taking propensity (situated rationality theory by Sustein, 2008), and entrepreneurship intention (Theory of Planned Behaviour by Ajzen, 1985). The choice of social-cognitivist models (social factors inherent in everyday decision-making) for the present work is situated within the larger argument of management gurus, Peter Drucker's (1985 & 1969) on innovation-led economic thinking and the age of discontinuity spurred by the knowledge economy. The views of economists such as Schumpeter (1934), Shane and Venkataraman (2000) have all found expressions in Drucker's proposition of what form would work be situated in the information society. Agreeably, the current generation of youth entering the job market is confronted with the herculean task of developing multiple skills driven mainly by technological competencies to adapt to the work environment. Therefore, students leaving Ghanaian business schools are not exceptions. Applying their knowledge to developing entrepreneurial competencies needed for economic growth is probably a clarion call rather than an option.

The rectangular boxes in Figure 1 represent constructs and theories with arrows indicating proposed hypotheses in the Ghanaian environment. The dashed lines represent emergent findings (supplementary hypotheses (sH) based on post-hoc tests in the results section of the study (see Sections 4.1.0 to 4.1.11) based on quantitative data explorations (Section 3.9 to 3.10.6).

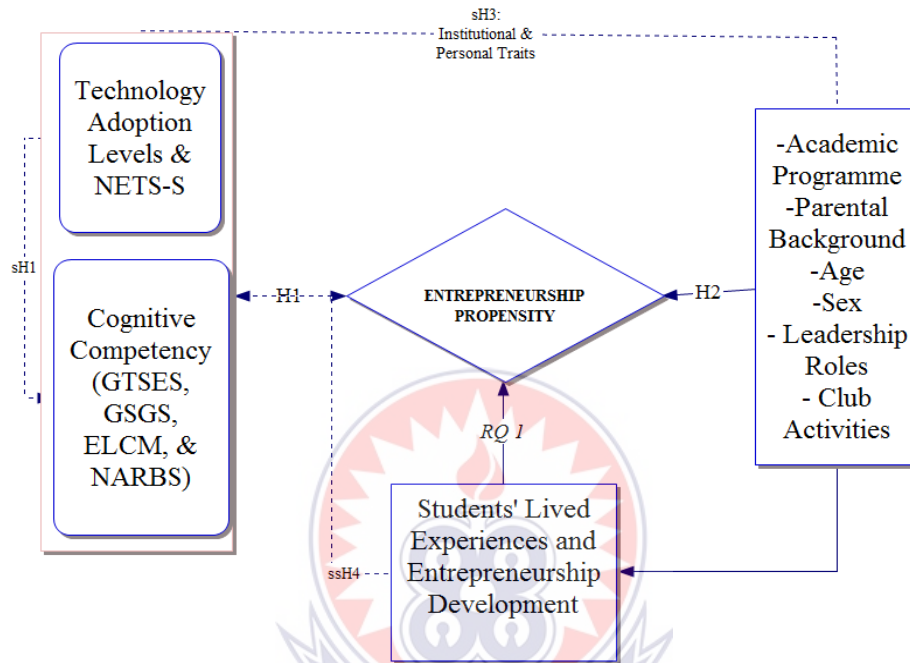


Figure 1: Proposed theoretical and conceptual framework for the study

Note: Adapted from cognitivism, concern-based adoption model, and Theory of Planned Behaviour for exploring entrepreneurial propensity. [NET-s – National Educational Technology Standards; GTSES – General Task Self Efficacy Scores; GSGS – Grit Goal-Setting Scores; ELCM- Economic Locus Control Measure; NARBS – Need for Achievement, Risky Behaviour Scores]; sH- Supplementary Hypothesis; RQ-Research Question; & H- Hypothesis].

Three *sH* are proposed. *sH1* sought to explain the relationships between students’ stages of technology adoption (STA) and social-cognitive variables, with *sH2* using students’ demographic traits as multiple discriminants to explore the technological and psychological variables in the model—the third supplementary hypothesis (*sH3- implied*) sought to explore students’ technology and cognitive traits. Academic programmes, extra-curricular activities, and leadership opportunities constituted institutional demographic variables, whilst age, sex, and parental

background represent business students' demographic constructs for testing proposed Hypotheses 2 (*H2*). In addition, *H1* proposed testing the influence of technological adoption and integration literacy in the model to predict students' stages of entrepreneurial career choice. The social-cognitive traits in the model are general task self-efficacy (GTSE), student grit goal-setting (SGGS), economic locus of control (ELCM), need for achievement (nAch), and risk-taking behaviour scores (RTBS).

2.4. Summary of Literature and Theories Reviewed

Despite the struggle to deconstruct entrepreneurial career choice, tones of literature have proven that its contribution to wealth creation is impeccable (Schumpeter, 1934; Venkataraman, 1997; Reynolds, 1987; De Carolis, 2003; Kauffman, 2007). Indeed, several nations have approached the phenomenon of entrepreneurship as a key to solving unemployment and expanding the fortunes of their people. However, the struggle to establish the field of entrepreneurship as a force to reckon with continues to receive criticism in the vocational psychology literature due to the dominance of scholars from diverse fields such as economics, psychology, marketing, finance, management, and more (Bull & Willard, 1993; Julien, 1989). Though such diversity has been hailed as providing multidisciplinary perspectives to issues in entrepreneurship research (Low & MacMillan, 1988; Baron, 1999), others heavily criticise such infiltration as usurping its autonomy (Zahra, 2005). Arguably, the role of technology in promoting entrepreneurship development has been discussed within the structural shift of today's world economic order, where emerging jobs are cognitive-driven and information processing.

Vocational theories abound in youth entrepreneurial career choice study. Prominent amongst them are the 'big-five' dominated by trait and factor school (e.g. Holland, 1997), SCCT (Lent, 2005), and the theory of circumscription and compromise

(Gottfredson, 1981). However, increasing use of these theories with univariate statistical strategies seems to be missing rich unique variances likely to be accounted for when making career and vocation choices for the youth. Therefore, the current study adopted social-cognitivists' theoretical frameworks as catalysts for tackling graduate unemployment in Ghanaian society today with multivariate approaches in predicting graduate entrepreneurial career choices in the Ghanaian context. Hence, the next chapter examines the methodological outlines for the research. Undeniably, the positivists' research designs dominated the methodology chapter of this study. However, interpretivist ideologies regarding the thick description of business students' entrepreneurship intentions and curriculum knowledge are also espoused within indigeneity.



CHAPTER THREE

RESEARCH METHODOLOGY

Entrepreneurial career decision-making literature has witnessed several research approaches, including case studies (Kuenyehia, 2012) and surveys (Fueglistaller & Zellweger, 2011; Geldhof et al., 2014). At best, such approaches can be described as a minimalist view of solving complex human problems. Minimalist practices are more dominant in the linguistic field, involving piecemeal adaptation to syntactic and grammatical issues in linguistic study (Yopchick & Nancy, 2011; Roberts & Roussou, 2003). Often, the minimalist approach has been adopted by social scientists with only one data collection method, which neglects macro analytical approaches that usually promote multiple perspectives on a phenomenon. Whilst denouncing such a piecemeal approach in entrepreneurship study, Jain (2011) asserts that researchers should instead employ maximalist methods involving statistical techniques that accommodate as many variables as possible to explain multifaceted constructs such as entrepreneurship. Hence, the current study adopts maximalists' views as a background theory to guide the research methodology in this dissertation. Therefore, this chapter describes such a maximalist approach, including the sequential mixed method technique as the research design. Furthermore, the population, sample, sampling, and reports on testing the psychometric properties of the pilot and final data collection instruments are discussed.

The reports on the quantitative data management from the survey instrument were examined using univariate and multivariate techniques. Inferential (multivariate

and univariate) statistics require assumption testing (Field, 2009; Healey, 2009; Heiman, 2011). The study further discusses multivariate assumptions such as equality of error variances, linearity, normality, and metric scale. Data cleaning and exploration tools such as outlier checks and missing data management have all been reported. The final sections of this chapter also address the collection, analysis, and interpretation of the narrative data from the cases in the FGDs. Validity and reliability outcomes from the data collection instruments are also outlined.

3.1.0 Research Design and Methodological Assumptions

Research methodologists seem to have outlined varied and confusing positions on what constitutes a research design that often could leave beginning researchers even more confused. For instance, Gall, Gall, and Borg (2010: p.33) provided historical perspectives in their description of a research design with the submission that it originated from researchers' attempts to establish standards for answering their research questions or testing hypotheses. Babbie's (2010: 91) 'interrogatives' is another rhetoric on what constitutes a research design. He specified that in social sciences, a research design specifies precisely *who* or *what* is to be studied, *when*, *how*, and for *what* purpose. He then outlined three primary purposes for research design: explanatory, exploratory, and descriptive. Babbie's advice to researchers to select their research designs based on the study's objectives is worthy of note. This study is guided by Babbie's recommendations that when we state research objectives to '*explain*' a phenomenon, we seek to establish causation, effect, or association between constructs - an approach often likened to hypothesis testing. *Descriptive* research allows researchers to provide varied perspectives to an event, and *exploratory* studies are usually designed to offer scientists a head start or provide familiarisation with an event of interest, Babbie conceded.

More controversies are even seen in Creswell's (2012, p.93) categorisation of research designs. First, he outlined three (quantitative, qualitative, & mixed) research designs and later detailed eight types (experimental, correlational, survey, grounded theory, ethnography, narrative, action research, and mixed methods) of research approaches that can constitute each of these three categories. Creswell further stated that six main types of mixed methods exist in the methodology literature (p.541), with the sequential (concurrent) mixed methods as an example. Gall et al. (2010, p. 465) defined the concurrent mixed method (CMM) as based on fit for purpose where quantitative and qualitative datasets are collected simultaneously or sequentially; however, with one form of data (quantitative or qualitative) providing a supportive role (Creswell, 2012, p. 544).

The confusion on the research design labels ranges from the foregoing submissions. However, what is the middle ground for researchers to adopt? The current study sought a determination from Babbie's (2010) advice on linking research designs to study objectives and the concurrent mixed method (CMM) research design. Creswell (2012) explains that mixed methods research design involves data gathering and analysis and integrating quantitative and qualitative approaches in a single or several studies to unravel a research problem. Stake (2010, p. 19) confirms that mixed method approaches assist in collecting qualitative data with interpretivists' philosophies in an explorative manner. Indeed, a combination of positivism (quantitative) and interpretivism (qualitative) requires the researcher to develop competency in both domains (Creswell, 2012, p.535). According to Gall et al. (2010), a mixed method is fit for addressing a phenomenon.

The CMM underpinned the current study, given the two primary purposes of the study (Section 1.3). Firstly, to predict relationships between Ghanaian business

students' socio-cognitive, technology integration literacy, personal, institutional, and entrepreneurship factors. Suggestions based on Babbie's (2012) supposition that when research objectives seek to explain an event, relationship testing is eminent applies to research Objective 1 for this study. Hence, cross-sectional survey data from different academic programmes in the business schools were gathered. According to Babbie (2010, p. 254), cross-sectional survey design involves the selection of a specific segment of the targeted population (respondents) and standardised questionnaires administered to them. He further states that surveys are probably the most suitable for parametric analysis and measuring attitudes in a large population. Research methods gurus also defined survey data as a "systematic collection of data about participants' views, attitudes, interest and behaviour using standardized measures such as questionnaires, interviews, and test items" (Gall, Gall, & Borg, 2010, p. 212). Others have also outlined the forms survey research can take: structured, semi-structured, oral, or written interviews separately or in combination (Fraenkel & Warren, 2002; Johnson & Christensen, 2008; Creswell, 2012). Some have also recommended that it is relatively cheap to gather large data from a population (Cohen et al., 2007).

Based on the Theoretical and Conceptual Framework (Figure 1) for this study, questionnaire items were used to measure business students' socio-cognitive traits, technology integration skills, and entrepreneurship decision-making to answer Research Question 1. The use of integrated theories and constructs in the present study was based on entrepreneurship researchers' views that the field needs more rigorous studies testing multiple models with sophisticated statistical analysis (Ireland & Webb, 2007; Jain, 2011). In addition, others made a case for cumulative knowledge (Grégoire, Meyer, & De Castro, 2002) in the entrepreneurship career field based on which dependent variables were measured. Quoting Brush et al. (2008), Wang and Jessup

(2014, p. 166) state, “The dependent variable is critically important in research because this variable is a leading indicator of the cumulative nature in the field.” On a more poignant note, Brush et al. concluded that the types of dependent variables also inform the convergence nature of the entrepreneurship field. Therefore, based on Rogers’ (1995) diffusion of innovations and the concerns-based adoption model of Hall and Hord (1987), cognitivism (i.e. self-efficacy, goal-setting, need for achievement, risk-taking behaviour, and economic locus of control), and the Theory of Planned Behaviour as covariates were measured and tested for Research Question 1 (see Table 3).

Secondly, to explore students’ views on indigenous knowledge systems, business, technology, and curriculum issues. Research Objective 2 agrees with Anderson and Starnawska’s (2008) assertion that the predominantly positivist’ approach to entrepreneurship research seems to overlook rich narrative data from entrepreneurs since the definition of constructs in the entrepreneurship field lends itself to varied definitions in different ecologies. Focus group discussions (FGDs) on technology integration literacy, indigenous knowledges, entrepreneurial decision-making, and entrepreneurship factors. Eleven accounting and human resource management students interviewed helped answer Research Objective 2. Exploring narratives from cases in qualitative data gathering can yield a rich and in-depth understanding of social and educational phenomena in situ (Bryman & Burgess, 1994; Johnson & Christensen, 2008). Qualitative case study designs involve investigating events or phenomena in context, in-depth descriptions, and process tracing (Blatter, 2008, p. 68). Hence, the study used a focus group discussion (FGDs) to explore Research Question 2 under two overarching themes (education and Indigenous entrepreneurial knowledges).

3.2.0 Population of the Study

Entrepreneurship researchers often highlight the relevance of understanding the context of entrepreneurial activities (Zahra & Wright, 2011) within environmental determinism that sometimes underpins human activities. Understanding the unique environmental factors likely to account for the theories explaining business students' entrepreneurship propensity would be necessary in evaluating the practical, managerial, and statistical significance of the proposed thesis statement. Therefore, this segment evaluates the present study on entrepreneurial phenomenon among business students in Ghanaian public universities as the population of interest.

The target population is individuals with similar attributes of interest (Frankel & Warren, 2002). Using a homogeneous population, this study used final-year undergraduate business students in Ghanaian public universities. Sieger, Fueglistaller, and Zellweger's (2011) global entrepreneurship intentions survey report shows evidence of homogeneous samples in entrepreneurship study. The choice of business undergraduates from Ghanaian universities was premised on the assumption that, perhaps, students' curriculum in the businesses had supports for theories and concepts development, hence better placed to exhibit unique experiences of entrepreneurship needed to propel business growth in their chosen fields.

Public universities offering undergraduate business programmes were selected as the population framework for the study. These included the University of Ghana, the University of Cape Coast, the University of Education, Winneba, the University of Professional Studies, Legon, Ghana Institute for Management and Public Administration. Kwame Nkrumah University of Science and Technology and the University for Development Studies. However, the conservative population of undergraduate business students from the universities were based on student enrolments

submitted to the National Council for Tertiary Education between 2015 and 2017 (NCTE, 2016). Table 1 shows a two-year average business admission estimate of 16% (n = 25, 685). A seven per cent increase in business students' enrolment was witnessed over the two years, whilst humanities attained the highest average (42%; n = 7,998). However, Applied sciences recorded over 7,000 reductions in student enrolments.

Table 1: Public Universities Regular Enrolments and Fields of Study

Subject	2015-2016	2016-2017	Average	% Average	Variance	% Variance
Humanities	63,960	71,958	67,959	42	7,998	12.50
Business	24,806	26,564	25,685	16	1,758	7.09
Science	25,662	31,527	28,595	18	5,865	22.85
Applied Science	26,423	19,177	22,800	14	-7,246	-27.42
Engineering	8,564	10,963	9,764	6	2,399	28.01
Pharmacy	918	1,484	1,201	1	566	61.66
Medicine	5,069	6,063	5,566	3	994	19.61
Total	155,402	167,736	161,569	100	12,334	7.94

Source: NCTE (2016)

The choice of business students from the seven public universities was based on literature that establishes the relationship between business courses and entrepreneurship propensity. The empirical study established that statistically significant associations exist between levels of entrepreneurial intention and the number of management courses taken among students (Atef & Al-Balushi, 2014: 3). Secondly, similar findings in Eastern Europe – Russia (Tkachev & Kolvereid, 1999) and Central Europe (Fayolle, Gailly, & Lassas-Clerc, 2006), entrepreneurship education is found to have correlated with students future entrepreneurship propensity.

The study chose final-year business students with the justification that their content knowledge about business curriculum could expose them to entrepreneurial awareness compared with their compatriots from non-business programmes.

3.3.0 Sampling and Sample Size

Sampling is the process of choosing a portion of the study population for a study (Cohen et al., 2007; Huck, 2012). Statisticians often adopt probability-sampling techniques (randomisation) to give equal representation to samples for selection (Johnson & Christensen, 2008). Randomization will increase the chances of generalising the findings to the entire population of the study (Healey, 2009; Field, 2009; Howitt & Cramer, 2011).

According to Robertson (2002), samples represent a population about which information is available, and survey results will infer. Using survey research and case study (FGD), this study examined the technological, cognitive, demographic characteristics, and lived experiences likely to influence business students' entrepreneurship propensity from Ghanaian public universities. Johnson et al. (2008) hinted that the choice of mixed methods design involved separate sampling approaches and sampling sizes for both paradigms. This section discusses the sampling approaches for generating the survey (709) and the narrative data (FGDs).

Onwuegbuzie and Collins' (2007) criteria based on the time orientation of the samples and the relationship between quantitative and qualitative samples underpinned the mixed sampling approaches in social and educational research. By time orientation, Onwuegbuzie and Collins suggest whether the data collection for both research paradigms occurred concurrently. Also, relationships between variables in areas of *parallel* (samples for both paradigms are different but drawn from the same population), data from the multilevel (samples obtained from varying levels of the population in

both quantitative and qualitative designs), *identical* (same participants), and *nested* (selected participants for one phase of the study represent a subset of the earlier group). According to Johnson and Christensen (2008), eight methods are available for mixed sampling techniques.

The sampling technique employed for the current study falls within the concurrent mixed method sampling described by Johnson and Christensen (2008). Just as the chosen design implies, they explained that concurrent mixed sampling involves data collection approaches by using sub-groups from the same population who stand the chance of generating both quantitative and qualitative data for a study. In line with their description, the present research selected 709 samples from the population of 4,596 (Table 1) and chose one university for the interview data concurrently. The choice of a Teacher University for the interview data is due to its relatively new business school status amongst the traditional universities such as the University of Ghana, Legon, and the University of Cape Coast. Besides, the interview data generated covered issues that scored weak coefficient values during the pilot study data (see Section 3.4).

The current study used two heterogeneous groups (HRM and Accounting) to explore students' lived experiences with their business education, entrepreneurship, indigenous knowledges, and technology integration literacy. In addition, I appealed to males and females to participate in focus group discussions to ensure gender balance.

Precisely, the *Rand* [] function in the Microsoft Excel package was used to sample the three universities (University of Ghana, Legon, University of Cape Coast, and University of Education, Winneba) from a sampling frame of seven public universities with business education faculties, schools, or departments. The *RAND* and *INT* functions use a computer's current time to generate random fractional numbers < 1 but ≥ 0 in a cell (MacDonald, 2005). The *INT* function converts fractional numbers

into integers. With a population frame of seven public universities, the study used a function: $[\text{INT}(\text{Rand}() * 7 + 1)]$ to generate integers between 1 and 7 in a random fashion. Two and four departments were sampled from the three universities depending on the number of academic programmes (Table 2).

Table 2 : Sample Statistics by University, Programme, and Gender

		Academic Department						Total	% Total
		Accounting	Human Resource Management	Marketing	Health Administration	Management			
Male	UEW	83	46	0	0	0	129	29.12	
	UCC	58	0	0	0	53	111	25.06	
	UG	149	10	11	33	0	203	45.82	
	Total	290	56	11	33	53	443	100	
	% Male	65	13	2	7	12	100		
Female	UEW	19	27	0	0	0	46	17.29	
	UCC	20	0	0	0	29	49	18.42	
	UG	112	19	18	22	0	171	64.29	
	Total	151	46	18	22	29	266	100	
	% Female	57	17	7	8	11	100		
Total	UEW	102	73	0	0	0	175	24.68	
	UCC	78	0	0	0	82	160	22.57	
	UG	261	29	29	55	0	374	52.75	
	Total	441	102	29	55	82	709	100	
	% Total	62	14	4	8	12	100		

Source: Survey data, 2016

Footnotes: UEW (University of Education, Winneba), UCC (University of Cape Coast), and UG (University of Ghana, Legon).

The generated random numbers matched the population serial numbers and integers 1-3 chosen to represent the universities. Similarly, academic programmes from the three selected universities were picked with the *RAND* function for questionnaire administration.

Sample Size Determination for the Study

In addition, several premises were considered in the sample size selection and examined further. Mathematical and heuristic techniques were used for sample size selection. Blalock (1979) uses the mathematical power criterion of within + or – 0.5 scale point. Krejcie and Morgan (1970) proposed a judgment based on meta-analysis to derive a recommended sample size and corresponding population usually used by educational researchers. Johnson and Christensen (2008) also submit that the most straightforward answer to how large your sample should be is determined by the more significant the sample size, the smaller the sampling errors. Johnson et al.'s view seeks to reduce the probability of committing Type I and Type II errors in *hypothetico-deductive* techniques (Babbie, 2010; Phillips & Pugh, 2005). Thus, the closer one is to the whole population, the greater the chance of detecting a zero sampling error, which is ideal.

However, it is always expensive to collect data from heterogeneous populations. The choice of randomisation would enable the generalisation of findings to population parameters (Johnson & Christensen, 2008). However, Krejcie et al.'s table of random numbers generation is seemingly fraught with the challenge of determining the entire population of interest. This can be problematic for researchers who cannot obtain valid data from such institutions and have poor record-keeping. Following the arguments on sample size determination, Cohen et al. (2007) proposed that sample size determination is instead an issue of prediction, standard error (difference between population and sample means), and human judgement. Varied sample sizes have been used to study the entrepreneurship intents of university graduates. For instance, Ryan, Tipu, and Zeffane (2011: 154) used 305 samples of business students in major universities in the United Arab Emirates (UEA). Others also employed large-scale country surveys with a

minimum of 220 (Liechtenstein) to as large as 29,186 (Brazil) in the 2011 Global University Entrepreneurial Spirit Students' Survey (GUESSS) project (Sieger et al., 2011, p. 9) as sampling frameworks. From hindsight, the study population seems to determine sampling approaches and sample sizes in empirical studies such as social and behavioural studies. In this vein, Atef and Al-Balushi (2014) used the census approach to collect data from 38 graduating tourism students in Oman. In determining the sample by educational researchers using students in an entrepreneurship study reported in this section, none showed the population figures from which samples are drawn, perhaps due to the unavailability of definite figures for such populations.

Record keeping might be a problem for many organisations; hence, there is a lacuna in quantitative research that attempts to estimate the exact population. In an attempt to address the difficulty in sample size determination, Johnson and Christensen (2008) also advised that in a homogenous population, smaller sample sizes should be of consideration. How smaller? The methodologists' prescription is silent on exact figures, which still draws one to consider Krejcie and Morgan's (1970) heuristic approach. Considering the debates on sample size determination and the perceived difficulties in determining exact student numbers from the participating universities, the current study employs a judgement approach because only historical data from the institutions were available at the NCTE (see Table 1). Also, determining students' numbers has always been problematic for higher institutions since issues like attrition rates face stakeholders; the study adopted conservative historical data from the NCTE to determine the final samples.

Therefore, a simple random sampling approach was used to select 709 samples from a homogeneous population of final-year business students in seven Ghanaian public universities (Table 2). However, the groups consist of 62% (n = 441) accounting,

4% (n = 29) marketing, 14% (102) human resource management, 8% (n = 55) health administration, and 12% (82) management students from three public universities. Objective 1 (Section 1.3) informed the choice of judgment estimates, which guided this study in predicting the various entrepreneurship propensities amongst students in Ghanaian public universities. In addition, using a heuristic for sample size selection for this study is tenable, based on Krejcie and Morgan's (1970) suggestion that a population of 500,000,000 needs a sample of 384. The historical data in Table 1 shows a two-year average annual graduation figure estimated at 4596 business students from the seven public universities offering business programmes between 2013 and 2015. The closest population estimates by Krejcie et al. are 4,000 and 5,000, with sample sizes between 380 and 381. In summary, the 709 samples from a homogenous group of business students should inspire confidence with an 86.09% (n = 328) increase in the recommended sample size by Krejcie and Morgan for the generalisation of hypotheses tested in this study. The perceived confidence for the current research stems from Cohen et al.'s position that the larger the sample size, the more advantageous for reliability and sophisticated statistics. Indeed, several parametric statistics, from univariate to multivariate, are built on robust premises favour large sample sizes (Field, 2009; Heiman, 2011; Huck, 2012; Shaughnessy, Zechmeister, & Zechmeister, 2012).

Even the sample size of 709 in this study aptly meets Steven's recommendations of 15 cases per independent variable to predict an outcome factor since the largest variates in Hypothesis 1 formulated for this study used five cognitive factors. By estimation, 75 samples are required to meet Steven's statistical approach to sampling in this study. In effect, a sample size of over 634 was used for significant testing in this dissertation. However, one has to remember that variations in responses on a construct that is diversely applicable in the population can affect the legitimacy of sample size

determination (Cohen et al., 2007). For instance, stages of technology development, entrepreneurship development, and demographic factors could differ significantly for individuals. In the case of Table 14, only 31% (n = 220) of samples were generated in interactive effect calculations using discriminant function variates in Hypotheses 2 to 4. Hence, the caveat of selecting a small sample size based on interactive effect calculations was also considered in this study.

Though the census approach is cost-prohibitive, it is a realistic sampling technique available to researchers when resources are available. In this study, it was not practicable to use randomisation in selecting the students due to time constraints in the questionnaire administration amongst different *academic programmes*. More so, it was not the aim of the current study to generalise the findings to individual programmes but instead to the seven public universities earlier sampled.

Characteristics of the Students Sampled

Personal characteristics and demographic variables such as age (Damon & Lerner, 2008; Sergeant & Crawford, 2001; Geldhof et al., 2014) and authoritative parentage (Schmitt-Rodermund, 2004) have been found to influence entrepreneurship intentions. Hence, this study sought to account for such personal characteristics (e.g. gender, age, academic programme, university, birth order, parenting style, and economic background) and extra-curricular initiatives (leadership role, sporting activities, and entrepreneurship seminars) in the Ghanaian context. Besides, demographic traits and extracurricular initiatives provided context for discussing research results in this study. Figure 2 provides descriptive statistics of samples' demographic variables that might be of interest in discriminant analysis in hypothesis testing (Section 3.10) in the current study.

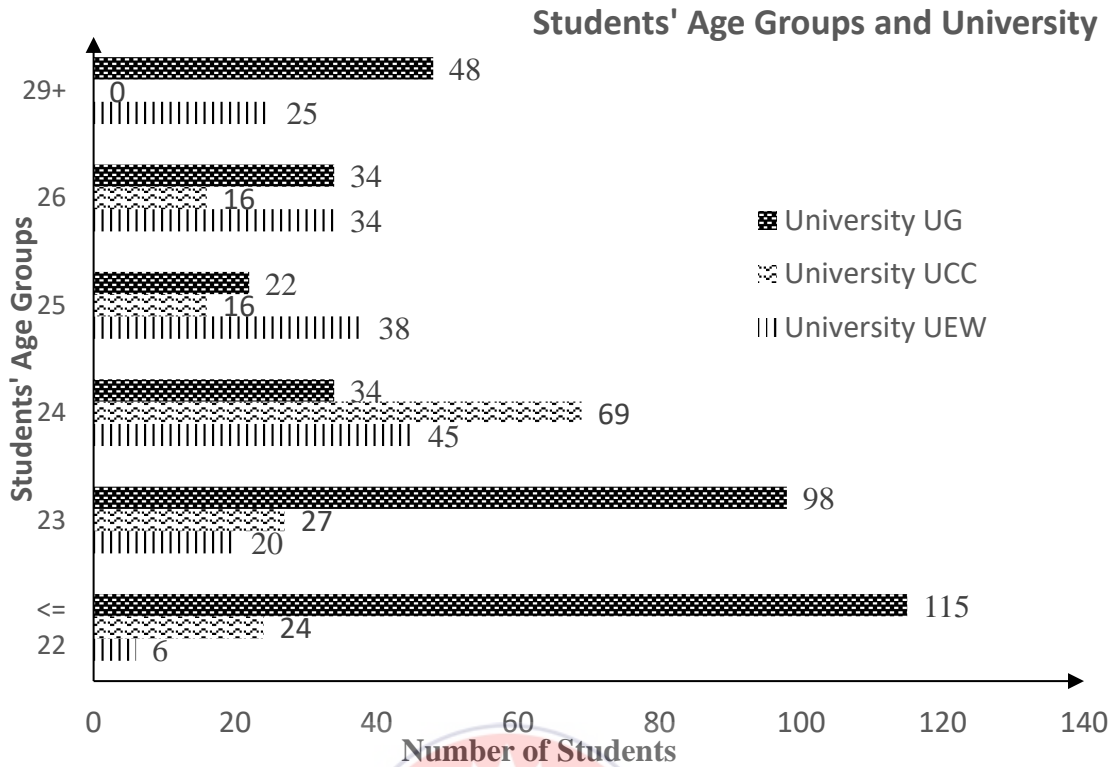


Figure 2: Students' age groups according to university.

In Appendix H1, the survey data showed that 94.64% ($n = 671$) of students indicated their ages in this study with 20 (minimum) and 49 (highest) years and an average age of 24.9 ± 4.01 (SD). The age data also produced a range of 29 (between least and maximum age). However, Figure 2 further shows details of sampled business students according to the university attended, with 22 and 23-year-old groups dominating undergraduate students' populations at the three universities with 43% ($n = 290$). This study's second dominant age group comprised 24-year-olds, with 22% ($n = 148$). Interestingly, no student from the University of Cape Coast (UCC) falls within the 29 years and above category in this study and 46.62% ($n = 69$) of the 24-year group characterised by the University of Education, Winneba students. Age has always been a critical variable in understanding student's interest in entrepreneurship activities (Geldhofet al., 2014). A combined percentage of youth is 65% ($n = 438$), mainly between 22 and 24 years, which also has ramifications for the qualitative and

quantitative data generated for answering the two research questions in the current study. Further demographic information from the survey instrument also revealed that female students were behind their male counterparts in access to computers and reliable Internet connectivity at home or school (see Figure 3).

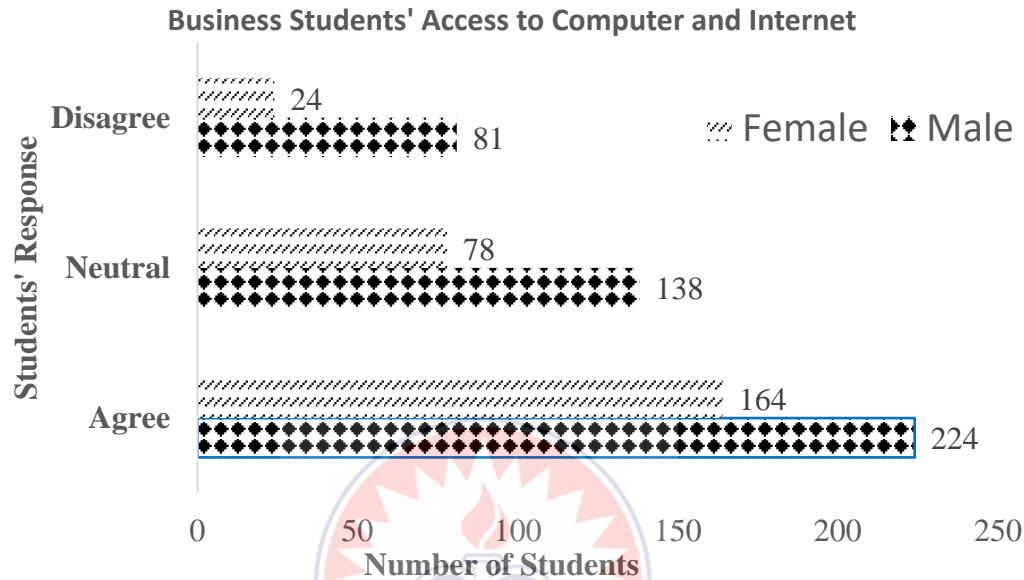


Figure 3: Gender and computer technology access

The ratio of male to female lack of computer and Internet access at home or school was 3:1 in this study. Thus, for every four business students without a computer, one was likely to be a female, considering even their weak numbers in this study- 38% (n = 226) females as against males' 62% (n = 443).

3.4.0 Pilot Testing of the Questionnaire

The rationale for the current section is supported by Leung's (1995) opinion that the majority of theories and career development and choice inventories were developed in the USA and advised cultural researchers to either opt for adaptation of existing measures or develop their instruments from scratch. The implications for either of these recommended methods are apparent, especially regarding cost and ecological validation issues. Therefore, the current study adapted existing inventories to measure

entrepreneurial career choices amongst Ghanaian business graduates with pilot testing reports.

Cohen et al. (2007: 173) distinguished pre-pilot and pilot survey (questionnaire). Researchers use open-ended questions to generate categories for multiple-choice questions during the pre-pilot stage (Johnson & Christensen, 2008). The pilot technique was used to test the final survey instrument with explorative factor analysis techniques (Section 3.4.0). In the pilot study for questionnaire construction, tests, or any data collection instrument, Gall, Gall, and Borg (2010, p. 36) recommended that a few research participants, before formal data collection, seek directions on unclear items or verify the existence of the behaviour in the population. Others also noted that pilot studies have been found to help with a questionnaire's reliability, validity, and practicality of a questionnaire (Wilson & McLearn, 1994). Therefore, the adapted questionnaires were subjected to a pilot study with 54 non-randomised final-year students from three programmes (Human Resource Management, Accounting, and Marketing) at the Department of Business Studies, Pan-African Christian University College, Pomadze, now Perez University (affiliated to the University of Cape Coast). Cohen et al. (2007) recommended that non-probability samples are advantageous, less complicated to set up, less expensive, and without intention to generalise the findings beyond the sample.

This segment reports the exploratory factor analysis (EFA) findings on the adopted survey instruments used in this study. Kantowitz, Roediger, and Elmes (2009) referred to factor analysis in questionnaire or test design as achieving parsimony with the questionnaire items. Factor analysis detects the constructs that underlie a dataset based on the correlations between variables (Field, 2009; Cohen et al., 2007). Others further explain that factor analysis research reduces many items to a smaller set and

presents the most significant variances shared by the exogenous variables or test theories about underlying behavioural structure (Tabachnick & Fidell, 2013). Similarly, demonstrating factor analysis, Ofori and Dampson (2011: 247-248) submit that EFA can select only indicators that measure the variable and improve construct validity. Practically, factor analysis has been used to condense a large set of variables of scale items down to a smaller, more manageable number of dimensions or factors in questionnaire construction (Pallant, 2005; Field, 2009; Howitt & Creamer, 2008; Chechenia, Shore, & Tabatabai, 2016). Field recommends using factor analysis to eliminate weak items that do not measure the underlying construct, thereby reducing an overloaded questionnaire when items record coefficients of .4 or below. Exploratory factor analysis helped eliminate weak questionnaire items that did not measure the seven latent variables (entrepreneurial career choice, curriculum-specific technology integration, goal-setting, self-efficacy, need for achievement, economic locus of control & risk-taking behaviours) of interest in this study. Child (1970), cited in Cohen et al., advises researchers to conduct factor analysis to help simplify and establish order among interrelated variables. Child observes that a hunch often precedes factor analysis regarding the factors that might emerge from the study.

However, Ofori and Dampson (2011) recommend measuring variables with Likert-type scale (metric data) formats for factor analysis. This study measured the factors using metric data ranging from 1-5 (CSTI) to 1-6 (SEPM). Hence, factor analysis was appropriate for the pilot instrument to establish the latent variables' construct validity and applicability in the Ghanaian setting. The use of EFA to test the pilot data in this study was also premised on ecological validity, retention of dominant traits (reliability), and cultural considerations guiding empirical research with questionnaire items adopted in this study.

Adherence to cultural views in academic research has received dominant advocacy by Pan-African writers. For instance, Dei (2012: 102) lamented that the extant literature and theories of Eurocentric origins often do not speak to African cases. Therefore, the need to deconstruct our African knowledges should be accepted as a distinct force in worldviews. Dei's views were guided by Nyamnjoh's (2012) earlier disgruntled acceptance of Western academic standards and reminds African scholars to watch the "intellectual imposter[s]" trap, who only mimic dominant theories and knowledge in the [Western] academy.

Consequently, the adapted survey instrument (*see* Appendix A) was factor analysed to establish the construct, internal and ecological validity, and reliability of the latent variables identified in this study. The dominant factors explaining technology and social-cognitive-based factors (goal-setting, self-efficacy, need for achievement and risky behaviours, and economic locus of control) accounting for Ghanaian business students' entrepreneurial propensity from selected public universities in Ghana were retained for the final survey data collection to answer Research Question 1.

Before performing the EFA on the pilot instrument for this study, normality, linearity, equality of variance, and outliers were graphically and statistically computed in addition to coding negatively worded items. Outliers are extreme scores that might be biasing the computations (Heiman, 2006: 139). They are also said to be scores that lie far away from the rest of the test items and can occur through data entry or extreme answers provided by respondents (Huck 2012: 41) and can be sensitive to factor analysis (Pallant, 2005; Field, 2009; Johnson et al., 2008; Creswell, 2012). Using the *Minimum* and *Maximum* options under the *Descriptive Statistics* Menu in IBM SPSS Statistics Version 23, the pilot study also investigated outlier cases.

Secondly, seven negatively worded items measuring students' grit goal-setting

(SGGS) behaviour (SGGS1, SGGS2, SGGS4, SGGS5, SGGS6, SGGS9, & SGGS19) and three low self-efficacy items (GTSEE2, GTSE6, & GTSE9) were reverse coded from 1 (Strongly Disagree) to 5 (Strongly Agree) using *Transform* → *Compute* Menu in IBM SPSS Statistics Version 23 package. In addition, the descriptive statistics of retained and deleted questionnaire items after the EFA determining dominant factors applicable to the Ghanaian context are shown in Table 3. In addition, each of the seven variables is reported with factor loadings (components) and total variance explained by each item (communality) to measure students' behaviours and attitudes on technology, cognitive, and entrepreneurship propensity dimensions.

From Table 3 (overleaf), the curriculum-specific technology integration (CSTI) factor recorded the highest deleted items with 35% (n = 18) out of 51 rejected items. Conversely, the need for achievement (nAch) factor witnessed the least deletion of 2% of items. In summary, the pilot study retained 68% (n = 107) of the initial items for the seven factors used in this study, with a 32% deletion rate. Invariably, the deletion of the 51 initial questionnaire items has implications for reliability, validity, and cultural sensitivity amongst business graduates and constructions of counselling tests of psychological factors in Ghanaian schools. Three latent variables (SEPM, ELCM, & nAch) also retained over 80% of the original items used in the pilot study. Therefore, the detailed report on each of the seven factors analysed with EFA (based on recommendations of Child, 1970; Tabachnick & Fidell, 2013; Pallant, 2005; Field, 2009; Howitt & Creamer, 2008) is presented in Sections 3.4.1 to 3.4.6. Before the detailed factor report based on the EFA, the next section (3.4.1) discusses the criteria used to explore the seven variables identified in this study.

Table 3 : Statistics of Retained and Rejected Questionnaires

S/N Factor	Initial	Reject (f)	% Reject	Retain (f)	Retain %	% of initial and retained
1. CSTI	30	19	36.54	11	10.28	37.93
2. GTSE	22	9	17.31	13	12.15	59.09
3. SGGS	20	11	21.15	9	8.41	45.00
4. ELCM	37	5	9.62	32	29.91	86.49
5. nAch	6	1	1.92	6	5.61	83.33
6. RTBS	6	3	5.77	3	2.80	50.00
7. SEPM	37	4	7.69	33	30.84	89.19
Total	<u>158</u>	52	100	107	100	
% Total		<u>32</u>		<u>68</u>		

Source: Pilot Study data, 2016 N = 54

Table 3's Notes: CSTI (computer-specific technology integration); GTSE (general task self-efficacy); SGGS (students' grit-goal-setting); ELCM (economic locus of control measure), nAch (need for achievement), RTBS (risk-taking behaviour and SEPM (students' entrepreneurship propensity measure). Reduction statistics for CSTI, GTSE, SGGS, nAch, and RTBS is 52.87 ($[83/157] * 100$) based on KMO and test of sphericity.

3.4.1 Adopted Factor Analysis Solutions for the Pilot Study

In factor analysis, not all items are retained due to different reasons often advanced by statisticians (Nunnally & Bernstein, 1994; Field, 2009; Hair Jr. et al., 2014). For instance, Rogers, Creed, and Searle (2009) used factor analysis with several criteria to determine the suitability of questionnaire items measuring medical doctors' areas of specialisation and location of practice. Kline (1998, p. 71) argues that item analysis is the "simpler procedure" to factor analysis. On other criteria for factor analysis, Nunnally and Bernstein proposed that item analysis could be used as a

preliminary statistical approach to eliminate redundant questionnaire items quickly. Therefore, considering the seven latent variables used in this study, other approaches to factor analysis such as sample size (Guadagnoli & Velicer, 1988) graphical representations (Cattell, 1966b), correlation matrix analysis criterion, Bartlett's test of sphericity, eigenvalues, and anti-image matrix (Kaiser 1974) were considered.

Indeed, one basic approach to addressing factor analysis is the inter-correlations among items. Tabachnick and Fidell (2013) advised that a few coefficients greater than .3 in the correlation matrix table should be of concern for factor computation. However, this study adopted Steven's (2002) and Field's (2005) recommendations of a .4 coefficient cut-off point for interpretative and explorative reasons. Besides, the experimental and non-randomised sample size of 54 is of concern to this study in the face of ranging contests on sample size in the factor analysis literature (Nunnally, 1978; Kass & Tinsley, 1979; Field, 2009; Tabachnick & Fidell, 2013; Everitt & Hothorn, 2011). Everitt and Hothorn reiterate that a sample size of 10 is helpful to advance an intuitive argument that larger sample (n) use should lead to more confidence in the generalisability of scores. Indeed, significant others have also proposed large sample sizes (n), not less than 300 (Field, 2009) for confirmatory factor computation. Still on n for factor analysis, Guadagnoli and Velicer (1988) concluded that researchers often adopt the minimum criteria of samples ranging from 50 to 400 rather than n to the number of variables (q) in the equation criterion based on the review of several studies. However, Hatcher (1994) advocates n to q as most appropriate for factor analysis. Consequently, this study draws confidence from Guadagnoli and Velicer's (1988) pragmatist view on sample size consideration as well as Everitt and Hothorn's non-generalisability of factor results based on 54 samples used since the primary focus of factor analysis used in the current dissertation is for construct validation of the pilot

data only. In addition, coefficient values of .4 were used to detect effect sizes and explain the percentage of variances in scores on the Likert-type scale with the decision to delete or retain factors (items) from the questionnaire using the *R*-matrix based on Steven's recommendation.

Secondly, linearity scores affecting EFA were of critical statistical consideration for the pilot data in this study. Despite mild multicollinearity not being a danger for factor analysis, Field (2009) warns that extreme multicollinearity (several variables correlating highly) and singularity (one variable explaining a large percentage of variance in another) do. Field further hints that it becomes impossible to account for unique contributions of variables to factor loadings in case of multicollinearity or singularity. Consequently, when inspecting inter-correlations (*R*-matrix) for factors, researchers must keep an eye on multicollinearity (coefficient scores of .80 and above, and singularity (coefficients of 1; perfect relationship) variables and remove one or more of the variables from the analysis during factor investigations (Pallant, 2005; Field, 2009; Ofori et al., 2011). However, inspecting the seven (CSTI, GTSE, SGGS, nAch, RTBS, ELCM and SEPM) correlation matrix tables for $r < .5$ during the pilot study was tedious due to the large questionnaire items used (107; see Table 3). Therefore, the determinant function of the *R*-matrix in IBM SPSS Statistics Version 23 came in handy for assessing multicollinearity and singularity in the *R*-matrices for the seven factors used in the study.

The determinant function inspects the *R*-matrix generated for identifying coefficient values greater than 0.80 –case of multicollinearity- (Ofori & Dampson, 2011:254; Field, 2009). Heuristically, the determinant value should be greater than 0.00001 but not 1. Field explains that the determinant informs us whether the *R*-matrix is singular (i.e. determinant = 0), all variables are unrelated (determinant score is 1) or

in between. Therefore, students' grit goal-setting (SGGS) scale, curriculum-specific technology integration (CSTI), general task self-efficacy (GTSE), and need for achievement and risky behaviours (NABS) were checked, and all found to have recorded determinant values greater than the 0.00001 criterion. Thus, CSTI factor recorded 1.84E-005 (which is 0.000184); SGGS = 0.0005; GTSE = 2.13E-006 (which is 0.000213); NABS = 1.67E-005 (which is 0.000167), conveniently, the four latent variables passed the singularity and multicollinearity tests. However, ELCM (determinant = .000) and SEPM (determinant = .000) produced contradictory multicollinearity reports in the pilot data with determinant values below the 0.0001 criterion. Because multicollinearity is not entirely visible from the SEPM and ELCM factors' *R*-matrices with CFA due to significant exogenous variables use, statisticians recommended the use of principal component analysis (PCA) and anti-image matrices to determine which items to retain or delete from a factor (Field, 2009).

The foregoing discussion on factor analysis presents that there is not one rule that fits solutions in EFA. For instance, using a determinant to check multicollinearity failed to generate values for the SEPM and ELCM factors in the pilot data. Therefore, the search for factor solutions in this study continues with prescriptions from statisticians such as Cattell (1966b), who recommended a scree plot (graphical approach) used with factor loadings below eigenvalues (distribution or intersection point of variables scores in geometric space when graphed) of *I* and at the point of inflexion should be rejected in factor analysis. Upon Cattell's suggestion, Figure 4 presents scree plots of the factor loadings in this study with their total percentage of variances explained. Using 12 questionnaire items, the nAch and RTBS factors (combined) recorded the 3 (least) loadings, whilst 37 items in the SEPM and ELCM accounted for 8 (highest) factor loadings simultaneously (*See Appendices G and H4*).

Even though the scree plots with the eigenvalue of 1 criterion explained a large percentage of variances between 77.80% (SGGS) and 90.13 (SEPM) in the factors (Figure 4), it was reasonably complex to isolate singularity and multicollinearity heuristically with the graphs using the point of inflexion as recommended by Cattell (1966b). The point of inflection is the steep to a shallow stage where the slope line falls below the eigenvalue of 1 (Gaur & Gaur, 2009: 142). There was the need to pursue other strategies capable of reducing the questionnaire size and being able to use only highly significant variables measuring the dominant traits with large effect sizes in the Ghanaian context, a priority for the pilot study.

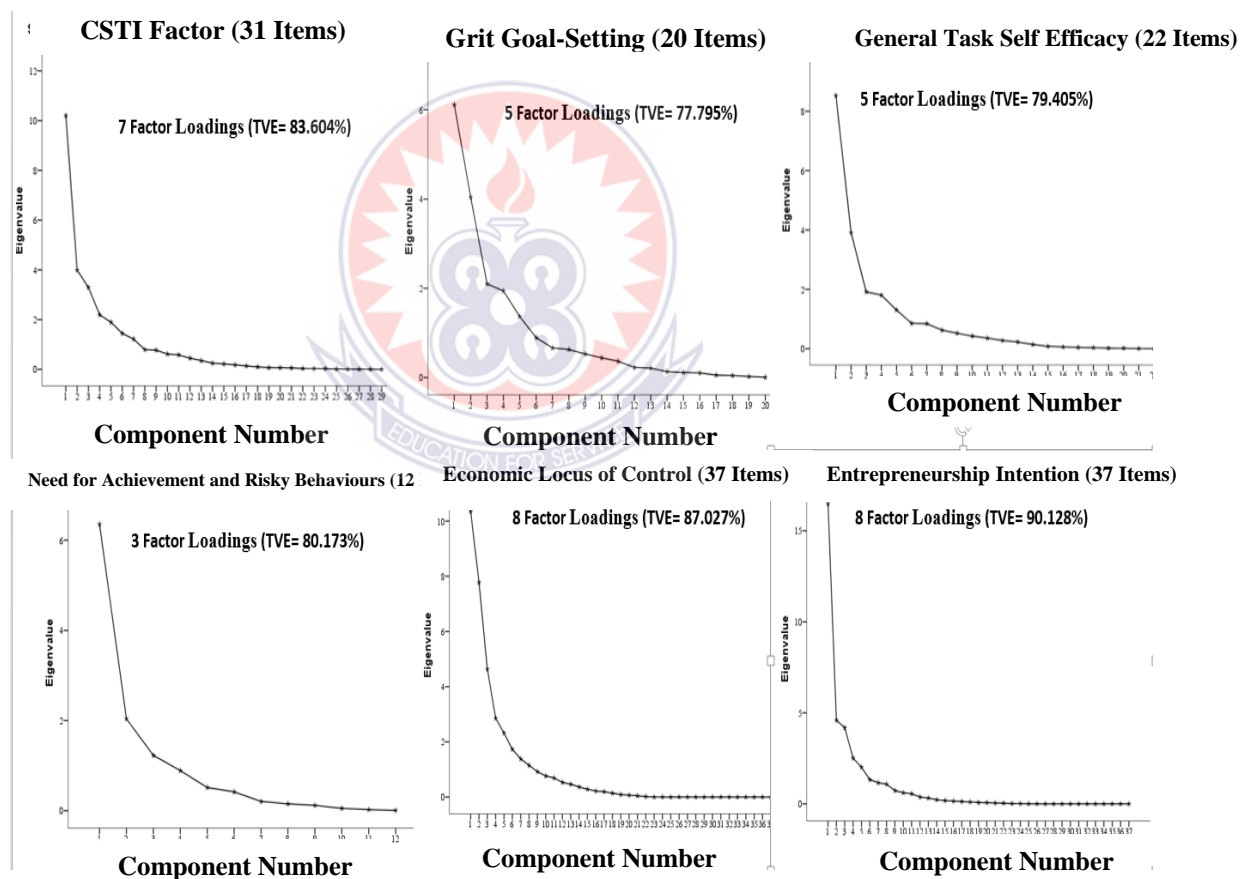


Figure 4: Scree plots of the six-factor loadings for the pilot study

Note: Shows the criteria of eigenvalue 1 and percentage of total variance explained (TVE). $N = 54$

Thirdly, although a scree plot provides a fair criterion for factor selection

(Stevens, 2002), others, such as Kaiser (1960) and Jolliffe (1986), argued for a much stricter approach that accounts for the significant variances in factors. With issues of social desirability effect and respondents' fatigue associated with questionnaire completions (Johnson & Christensen, 2008; Cohen et al., 2007), this study considers the use of 107 questionnaire items (Table 3) for measuring seven factors and other demographic factors (see Appendix C) might pose problems to respondents in answering the questionnaires. Hence, further variables were maintained, explaining high variances in the seven factors in this study based on Kaiser's (1960) recommendation to retain all factors with eigenvalues of 1 or greater. Unfortunately, Jolliffe (1986) criticised Kaiser's criterion as too strict and suggested maintaining all factors with eigenvalues of more than .07. Joining the factor debate, Field (2009: 641) also considers Kaiser's eigenvalues of 1 scheme as an overestimation of the variables that may result in loss of vital exogenous items. Similarly, Field thinks Jolliffe's recommendation is too liberal and may retain weaker factors in EFA. However, Kaiser's approach is considered accurate, with less than 30 variables and acceptable commonalities between 0.6 and 0.7. Because of the ongoing debates on which approach to adopt in applying EFA to the pilot data, this study examined the statistical significance of Kaiser's criterion in Table 4 after discussing other protocols, such as sample size and Bartlett's test for sampling adequacy, to find common grounds for examining the ELCM and SEPM factors.

The sampling size used in factor analysis accounts for fluctuating correlation coefficients from sample to sample with several 'rules of thumb' (Field, 2009: 647). One school of thought favoured sample size determination per number of variables in a study- the '*ratio*' school of thought. Such individuals include Nunnally (1978), who advised that 10 items per variable could be ideal. Similarly, Field (2009) proposed 10-

15 (least) samples per variable. Kass and Tinsley (1979) offered the least sample size (between 5 and 10) per variable.

The second school of thought (which can be coined as the *large samples school*) includes Tabachnick and Fidell (2013), who also recommended a sample size between 300 as good, 100 as poor, and 1000 as excellent for factor analysis. These recommendations, perhaps, leave researchers confused than ever. However, the use of simulated data such as in Monte Carlo studies and real-life data to study the effect of diverse participants to a variable ratio, Arrindell & van der Ende (1985) concluded that the variations in ratio contributed no impact on the stability of factor solutions in a study. Consequently, Guadagnoli and Velicer (1988) proposed a ‘pragmatic’ approach to determining sample size in factor analysis. They suggested that the absolute sample size and the magnitudes of factor loadings are of value to achieving reliable factor loadings. Therefore, if a factor loading is more significant than 0.6, then it is trustworthy regardless of the study's sample size.

Similarly, adopting the coefficient perspective to determining sample size for factor analysis, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy proposed by Kaiser (1970) and Bartlett's test for sphericity (with chi-square tests $<.05$) provide another dimension to the debate on sampling adequacy. The overall KMO statistics measure the ratio of squared correlations between variables and the squared partial correlation between variables computed for individual and multiple (overall) variables in a study (Field, 2009). The KMO statistics ranged between 1 and 0, where 0 indicates that the sum of partial correlation is large relative to the sum of correlations, representing diffusion in the pattern of correlations; hence, factor analysis is not recommended. On the other hand, a KMO value of 1 indicates compact patterns of correlations, and factor analysis should be acceptable, Field suggested. Realistically,

reaching a coefficient value of 1 in statistical computation has been considered nearly impossible due to measurement errors, sampling mistakes, and margin of error accounts. Therefore, statisticians often aim at figures near 1 (.8 to .9 and above). According to Field (2009: 659), Kaiser (1974) recommended a KMO coefficient of .5 as the barest minimum acceptable in testing sampling adequacy. Hutchenson and Sofroniou (1999) further interpreted KMO values of 0.5 and 0.7 as mediocre, values between 0.7 and 0.8 as good, and 0.8 and 0.9 as superb criteria used extensively to interpret inter-correlation coefficients in this study.

The use of Bartlett's sphericity test is closely linked with the KMO statistics, which accesses the chance that the original R -matrix is identical (thus, the R -matrix is 0). A significant Bartlett's test signifies inter-correlations between variables. Hence, the R -matrix differs from zero (thus, coefficient values are moderately correlated (Ofori et al., 2011). Correlation between latent variables is necessary for relationship testing in parametric statistics use (Hair Jr. et al., 2014; Black, 2010; Field, 2009). Table 4 shows the results of the KMO test for sampling size adequacy and Bartlett's test of sphericity for four factors (CSTI, SGGs, GTSE, & NABS) with questionnaire items less than 30 in two parts (*initial* factor based on $n = 54$ and *final* factor analysis with $n = 709$).

The use of the Kaiser-Meyer Olkin Measure of sampling adequacy criterion and Bartlett's test of sphericity produced for the four variables yielded a 52.87% ($n = 83$) reduction in questionnaire items for the pilot data (*see* Note accompanying Table 3). Averagely, the four factors' overall KMO coefficient values were mediocre ($r = .484$) for the initial factor loadings. However, Bartlett's tests for sphericity for the four factors were significant (i.e. the R -matrices were not identical). In other words, the items on the individual scales were significantly related, igniting confidence in the pilot data that relationships exist between the exogenous items used to measure the four factors in the

study. The initial individual KMO statistics confirmed the average, mediocre scores with all coefficient values between .383 (SGGS) and .612 (NABS), in line with Hutcheson and Sofroniou's (1999) interpretations. The second segment of Table 4 shows the evidence of applying Kaiser's (1974) (KMO) criteria where *R*-values less than .5 were omitted; the subsequent CFA analysis yielded superb KMO values between .682 (SGGS) and .849 (CSTI).

Table 4 : KMO and Bartlett's Test for Technology and Cognitive Factors

Factor	Initial Factor Computation			Final Items Extracted		
	No. of Items	Overall KMO	Bartlett's Test of Sphericity	No of Items	Overall KMO	Bartlett's Test of Sphericity
CSTI	31	.502	$\chi^2 (406) = 2050.075, p=.001$	11	.849	$\chi^2 (66) = 525.082, p =.001$
SGGS	20	.383	$\chi^2 (190) = 1038.011, p=.001$	9	.682	$\chi^2 (36) = 258.218, p =.001$
GTSE	22	.437	$\chi^2 (231) = 1451.971, p=.001$	13	.777	$\chi^2 (78) = 585.413, p =.001$
NARB	12	.612	$\chi^2 (66) = 776.095, p=.001$	9	.815	$\chi^2 (36) = 540.785, p =.001$
Total/Mean	85	(M = 0.484)		42	(M= 0.782)	

Source: Pilot Study Data 2015. N = 54

Note: 12 items measuring the need for achievement and risky behaviour are combined for the KMO test. Using the KMO test for sampling adequacy and Bartlett's test for sphericity, 50.59% ([43/85] *100) dominant technology and cognitive traits are retained for final data collection in this study.

The initial factor computation column in Table 4, the final questionnaire items extracted based on Kaiser's recommendations with chi-square results for Bartlett's test (sphericity) produced highly significant ($p < .05$) results that indicated that the correlation matrix for the four variables passed the multicollinearity tests too.

Per the narratives on criteria for factor analysis, no one specific procedure has provided a solution, as seen in the works of Field (2009), Tabachnick and Fidell (2013),

Stevens (2002), Jolliffe (1986), Kass and Tinsley (1979), Nunnally (1978), Kaiser's (1974), and Cattell (1966b). Table 4 shows that only four variables in this study were successfully analysed using Kaiser's criterion for sampling adequacy and Bartlett's test for sphericity. Numerically, the deletion of the weaker items reduced the initial 85 metric items by 49% ($n = 42$) based on factor analysis.

However, when the determinant criterion was applied, ELCM and SEPM variables displayed non-positive definite matrix error messages. Field (2009) explains that non-positive definite matrix errors can occur for three reasons when using IBM SPSS Statistics Version 23 for CFA data analysis. Thus, (i) encountering negative factors in the *R*-matrix since the determinant and KMO statistics rely on positive definite *R*-matrix, (ii) dealing with too many or few cases of data that render the *R*-matrix a bit unstable, and (iii) too many singularities (highly correlated items) in the field data. Also, Field argues that Kaiser's prescription for assessing the importance of factors is only accurate when variables are less than 30 and communalities after extraction are more significant than 0.7 or when the sample size is more than 250, and the average communalities also exceed 0.6. Average communality scores exceeded Field's recommendation of 0.6. Promisingly, SEPM (average communality = .901) and ELCM (average communality = .870) factors performed well in this study.

Another reason why the two factors (ELCM & SEPM) produced non-positive definite matrix error could be due to the two variables measured with 37 items, each with a relatively small sample size ($n = 54$). Hence, IBM SPSS Statistics Version 23 might not be able to generate overall KMO and Bartlett's test statistics for the *R*-matrix in the pilot data, in consonant with Field's (2009) earlier arguments. Even though no singularity was spotted in the *R*-matrices during data screening, two quantitative items (19 SEPM and 52 ELCM) produced negative individual coefficient scores, which were

causes for concern with IBM SPSS Statistics Version 23 package; probably, the result of non-positive definite matrix errors reported for the two variables in this study.

Researchers are, however, advised to employ sound judgements (Ofori & Dampson., 2011; Field, 2009) that work for them based on their objectives for factor analysis. The main objective of this pilot study was to retain the highest factor loadings accounting for the variables measuring business students' entrepreneurial propensity, technology integration literacy, and cognitive variates. The anti-image correlation matrix came in handy since Kaiser's (1974) criterion could not account for sampling size adequacy and sphericity statistics for ELCM and EPM variables in this study.

Anti-image is another form of KMO statistics. KMO statistics generally examines the entire *R*-matrix for multiple and individual variables' sampling adequacy (Field, 2009:659). Hence, anti-image matrices generate KMO for individual variables in the *R*-matrix diagonally (Ofori et al., 2011: 254) using Kaiser's barest minimum criterion of .5 and Hutcheson and Sofroniou (1999) coefficient values evaluations. Therefore, three initial items (SEPM - Q3, Q12, & Q 36) and ELCM - Q9, Q10, & 27) were deleted due to their weak anti-image values produced in the *R*-matrix tables. In conclusion, the study used the anti-image matrix to determine individual KMO values with Hutcheson and Sofroniou's (1999) interpretations of Kaiser's criterion for the seven variables (CSTI, SGGS, GTSE, nAch, RTBS, ELCM, & EPM).

Finally, the pilot study presents the internal consistency scores for the seven factors measured using Cronbach's alpha. Figure 5 shows that the average reliability statistics derived from the retained items for the seven factors was 0.9 (very high), with an average of 15 items per factor. The high coefficient values recorded might indicate good construct and criterion validity in the pilot data.

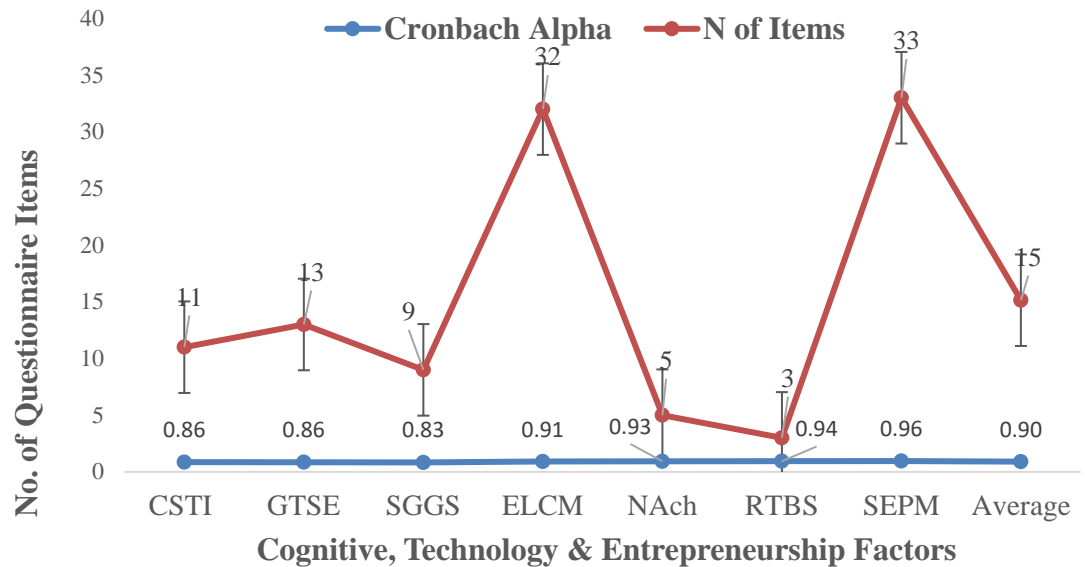


Figure 5: Cronbach alpha values and retained items from the pilot study

Consequently, the detailed tables showing the retained variables likely to measure the constructs predicting business students' entrepreneurial competency are presented in the next segment. However, relabelling common factor loadings was outside the scope of the pilot study.

3.4.2 Curriculum-Specific Technology Integration Factor

This section presents the factor analysis results on the variances likely to account for business students' entrepreneurial competency using anti-image matrices with Kaiser's (1974) criterion (Appendix G). Secondly, the reliability coefficients are presented for the retained items measuring the curriculum-specific technology integration (CSTI) construct.

On account of the Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of sphericity, exploratory factor analysis (EFA) was conducted on the significant items measuring curriculum-specific technology integration (CSTI) competency was retained for the final questionnaire in this study (Table 5).

Table 5: Rotated Component Matrix^a for Retained CSTI Factors

S/N	Questionnaire Item	Factor			Communality Score
		1	2	3	
1.	CSTI 12 (I can share files with my friends over the Internet during group/project work.)	.879			.788
2.	CSTI 14 (I am able to send bulk letters using mail merge in word processors)	.855			.846
3.	CSTI 15 (I am able to use conferencing software (e.g. Skype) for group discussions with peers.)	.835			.729
4.	CSTI 9 (I am able to conceptualise (model) business processes with computer	.813			.748
5.	CSTI 13 (I am able to use editing features in word processors to comment on friends' assignment papers)	.805			.822
6.	CSTI 17 (I understand netiquette involves using technology to communicate with a global audience as a business student)	.731			.687
7.	CSTI 30 (I advocate and practice safe, legal and responsible use of ICT tools for education)	.706			.801
8.	CSTI 16 (I can effectively design and present my business proposals using presentation software)	.606			.810
9.	CSTI 21 (I can use computer software to organise and analyse business data)		.878		.843
10.	CSTI 18 (I am able to use office applications to present project reports)		.818		.721
11.	CSTI 28 (I can effectively use Microsoft Excel for problem-solving and decision making)		.741		.715
12.	CSTI 29 (I can effectively design and present my business proposals using presentation software.)			.882	.845

Source: Pilot data 2015.

N = 54

Based on Kaiser's (1974) recommendation of adopting KMO value of 0.5 or better, twelve questionnaire items (CSTI 9, CSTI 12, CSTI 13, CSTI 14, CSTI 15, CSTI 16, CSTI 17, CSTI 18, CSTI 21, CSTI 28, CSTI 30, & CSTI 16) produced individual KMO statistics between .606 and .882. The KMO statistics have seen an improved overall score of .849 (superb) and significant ($\chi^2(66) = 525.082, p < .05$) Bartlett's test of sphericity (see Table 4). Three-factor loadings explained 78.020%

(Figure 4) of the variance in the CSTI factor. The only item, CSTI 29, was significantly loaded on Factor 3. However, *Factor 3* is discounted during factor labelling based on the recommendation that factor loadings with less than three items cannot be said to be a representation of a dimension (Field, 2009).

Using the orthogonal rotation method (Varimax), the eigenvalue of the *K-1 criterion* (Kaiser, 1974), and suppression of factors less than 0.4 (Stevens' 2002 suggestions) produced factor loadings structured in order of magnitude for the CSTI questionnaire items (Table 5). Established common themes underlying each factor loading were obtained, with dominant items measuring the seven endogenous constructs as the main objective of EFA in the pilot study. On the other hand, sub-dimensions detected during factor loadings were mainly named during interview protocol construction (*see* Section 3.6) with confirmatory factor analysis (CFA) in this study.

3.4.3 Business Students' Goal-Setting Grit Scale

Seven exogenous items (SGGS1, SGGS2, SGGS4, SGGS5, SGGS6, SGGS9, &SGGS19) were negatively worded to prevent response bias on the adopted goal-setting grit scale (SGGS). The seven items are reverse-coded before running the EFA in IBM SPSS Statistics Version 23. The initial EFA with orthogonal rotation (varimax) results used twenty questionnaire items with five-factor loadings and 77.795% of the variance explained (*see* Figure 4). However, the anti-image metric retained nine items from the original 20 (*see* Table 3).

The correlation matrix for the nine retained items measuring the goal-setting behaviour of business students yielded an overall determinant of 0.0005 (greater than Kline's recommendation of .00001). The determinant value indicated that the correlation matrix for the retained items measuring business students' goal-setting grit

was non-identical. The Kaiser-Meyer Olkin (KMO) measure is used to verify the sampling adequacy for the analysis with a KMO of .682, considered 'good' according to Hutcheson and Sofroniou (1999) and a significant Bartlett's test of sphericity ($\chi^2(36) = 258.218, p < .001$), indicated that relationship between items were sufficiently large for factor analysis in this study (see Table 4).

In addition, Table 6 (overleaf) depicts the coefficients of the three-factor loadings with their commonality scores on goal-setting. The three components had eigenvalues larger than Kaiser's criterion of 1, accounting for 77.795% of the variance explained (TVE) in the *SGGS Factor* (Figure 4). However, Table 6 depicts individual KMO scores ranging between .470 and .907 (mediocre and good, respectively, according to Hutcheson and Sofroniou's (1999) evaluation criteria.

Uniquely, the loading from the current work shows two additional factors (*Consistency of Interest* and *Perseverance of Efforts*) by Duckworth, Peterson, Matthews, and Kelly (2007, p. 1090) as observed from Table 6 (overleaf), three items, each highly loaded on three factors with strong commonality values between .682 (SGGS4) and .871 (SGSS16). Similarly, individual questionnaire items on the present constructed (Grit Scale) performed well with a moderate 0.47 (SGGS 19) to high as 0.90 (SGGS 9) alpha values for final survey data collection.

Considering the importance of the goal-setting construct, this segment deviates from the practice in the pilot study in not labelling factor loadings from the EFA. Consequently, the study proceeded to label the three extracted factors using Varimax with the Kaiser Normalization rotation method after confirmatory factor analysis (CFA) as (i) *Goal Perseverance*, (ii) *Goal Focus*, and (iii) *Goal Resource Preparedness* based on the 9 items. Otherwise, as stated during the data exploration stage, the overall internal consistency result for the constructed Grit Scale was 0.83 (Figure 5) for

hypothesis testing, as illustrated in the conceptual model (Figure 1) developed for this study.

Table 6 : Rotated Component Matrix^a for the SGGS Factor

S/N	Questionnaire item	Component			Communality Score
		1	2	3	
1.	SGGS16 (I have achieved a goal that took years of work.)	.857			.871
2.	SGGS20 (I am resilient in my goals)	.828			.727
3.	SGGS12 (I read several career transformation books every year.)	.824			.743
4.	SGGS19 (Setbacks greatly discourage me)		.470		.758
5.	SGGS9 (I plan my holidays more than planning my life)		.909		.835
6.	SGGS6 (I have difficulty maintaining my focus on projects that take more than a few months to complete)		.716		.693
7.	SGGS14 (How much money have you saved and invested this year?)			.907	.829
8.	SGGS13 (I attend many career development seminars these past years.)			.781	.764
9.	SGGS4 (My interests change from year to year)			-.565	.682

Source: Pilot Survey data 2015

N = 54

a. *Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 5 iterations. Source: Pilot data, 2015*

3.4.4 General Task Self-Efficacy Construct

Twenty-two test items measuring the self-efficacy construct (Table 7 - overleaf) were adapted from Bandura's work on "Regulation of cognitive processes through perceived self-efficacy", reported in *Developmental Psychology* in 1989. To establish construct validity, the 22 items in the Ghanaian context were computed with the varimax (orthogonal) rotation method in CFA (see Table 4 for KMO and Bartlett's test for sphericity reports on the initial 22 items adapted to measure the construct). Table 7 shows the results of an exploratory factor analysis (EFA) on the second cognitive construct (GTSE) proposed to predict business students' entrepreneurial propensity.

However, using the Kaiser-Meyer-Olkin measure for sampling adequacy, 13 items were retained after three re-runs of the EFA and deleting anti-images less than the .05 criterion (Kaiser, 1974).

Table 7: Rotated Component Matrix^a for General Task Self-Efficacy Scores

S/N	Questionnaire Item	Component		Communality Score
		1	2	
1.	GTSES10 (I believe in my physical capabilities to accomplish most tasks I wanted to)	.826	.318	.783
2.	GTSES11 (I am able to manage difficult situations and calm passions)	.811	.345	.777
3.	GTSES1 (I always feel confident in my ability to perform well on new tasks)	.776	.531	.884
4.	GTSES22 (On average, other individuals are probably not as capable of doing as well on learning tasks as I am.)	.707		.517
5.	GTSES15 (I practice difficult tasks as often as possible till I succeed)	.699		.537
6.	GTSES9 (I am always active by selecting the best opportunities in my life)	.696	.506	.741
7.	GTSES18 (I can often see a successful end to every task I engaged in)	.688		.514
8.	GTSES21 (I always learn from my mistakes in life)	.676	.550	.759
9.	GTSES2 (I tend to avoid difficult situations in my life)	.637		.410
10.	GTSES14(I always persevere on tasks till I achieve them)	.636	.614	.782
11.	GTSES13 (I have the ability to adhere to standards set for academic work in the university)	.608	.607	.739
12.	GTSES7 (I would have to practice for a long time to be able to do well on social tasks)		-.852	.652
13.	GTSES6 (I am not sure I can ever do well in graduate school, no matter how much I learn.)		-.805	.652

Source: Pilot Study Data 2015

N = 54

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 3 iterations.

Figure 4 shows that 79.405% of TVE with 13 retained items scored commonalities between .410 (GTSE 2) and .884 (GTSE 1). Two components were extracted from the 13 retained items, 79.405% TVE on self-efficacy score in the instrument construction (Figure 4). Similarly, 11 items loaded highly on component 1 with common loadings, which explained a moderate relationship ($r = .545$) between the two extracted components. However, since Component 2 could not load more than two factors, only Component 1 was retained for the self-efficacy measure in the pilot study.

3.4.5 Need for Achievement and Risky Behaviours Factors

It must be mentioned here that even though seven latent variables were used in the final study, EFA's need for achievement and risky behaviour factors were combined at the questionnaire construction stage due to the small number (12) items measuring the constructs at the initial stage. The KMO criterion and Bartlett's test for sphericity were used to retain nine items from the original 12 for the need for achievement and risky behaviour (NARB) scores (Table 4). The deletion of three items improved the KMO statistics by 24.91% (.203) with significant Bartlett's test ($\chi^2(36) = 540.785, p < .05$) for the eight items also reported in Table 4.

Table 8 presents the components extracted and communality scores from the nine retained questionnaire items measuring the NARB construct in the pilot study. Two components were extracted from the nine items. Six items (NARBS2, NARBS3, NARBS12, NARBS6, NARBS7, & NARBS8) loaded on *Component 1* and three (NARBS8, NARBS4, NARBS5) on *Component 2*. The two components highly explained 79.804% of the total variance in the NARB endogenous factor. Only item 6 (NARBS6: *I spend a considerable amount of time making an association I belong to function better*) had a common factor loading, though loaded highly on component 1. Except for Items 7 (.535) and 12 (.693), with moderate communality scores, the retained

questionnaire items for the NARB construct explained a high percentage of variance (between .778 and .919) individually.

Table 8 : Rotated Component Matrix^a for NARB Factor

S/N	Questionnaire item	Component		Communality Score
		1	2	
1.	NARBS2 (I am focused on achieving my career goals)	.846		.919
2.	NARBS3 (I will not be satisfied unless I have reached the desired level of results)	.792		.852
3.	NARBS1 (Even though people tell me it can't be done, I will persist)	.787		.778
4.	NARBS12 (I consider security an important element in every aspect of my life.)	.761		.693
5.	NARBS6 (I spend a considerable amount of time making an association I belong to function better)	.717	.522	.786
6.	NARBS7 (I will not register for a course when I know the lecturer is strict)	.707		<u>.535</u>
7.	NARBS8 (I like exploring abstract mathematical concepts in business decision-making)		.904	.836
8.	NARBS4 (I try to do my job as well as possible even when the tasks assigned to me are difficult)		.904	.880
9.	NARBS5 (I never put important matters off until a more convenient time)		.896	.904

Source: Pilot Study Data 201

N = 54

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 3 iterations.

3.4.6 Economic Locus of Control and Entrepreneurship Propensity

The economic locus of control measure (ELCM) and students' entrepreneurial propensity measures (SEPM) had 37 questionnaire items each for the pilot study. The two constructs produced non-definite *R*-matrices with determinants less than .00001 criterion (Field, 2009), perhaps due to sample size, 30+1 variable rule, and

multicollinearity problems explained earlier in this segment. Consequently, the pilot study used the reproduced correlation matrix (*R*-matrix) to inspect for individual multicollinearity for the two factors. The reproduced *R*-matrix that displayed the anti-image *R*-values was inspected with Kaiser's (1974) 0.05 criterion (KMO). Thus, according to Kaiser, KMO values greater than .05 represent a good measure for factor analysis.

An EFA was conducted on the 37-item questionnaire with orthogonal rotation (varimax) for ELCM (*see* Appendix E). The 37 items were loaded on eight components using a rotated component matrix table. However, between one (Component 8) and 11 (Component 1), items significantly loaded on eight axes. Four questionnaire items (ELCM 9, ELCM 10, ELCM 19, and ELCM 27) fell into this category. However, the pilot study maintained the four items due to their good KMO values (between .5 and .858) for the final data collection instrument subject to further analysis and hypothesis testing in Section 3.10. Remarkably, the eight components explained 87.027% TVE (Figure 4) of the economic locus of control measure with communality values between .721 (ELCM7) and .946 (ELCM12), an indication of a large percentage of variations explained by items collectively (Appendix E).

Similarly, eight components were derived from the 37-item questionnaire for measuring business students' entrepreneurial propensity (SEPM) in this study, which accounted for 87.027% TVE (Figure 4) in the student's entrepreneurial propensity measure. Three and 13 variables loaded highly on seven components, with only SEPM15 loading on component 8 (*see* Appendix F). In addition, common factor loadings are observed between the components. For instance, the SEPM2 variable is loaded on Components 1 and 4. Finally, the SEPM10 factor was loaded on Components 2 and 5, and the SEPM30 loading on Components 2 and 4 indicated common

relationships between the components.

Closely examining the commonality scores indicates that each variable explains a high percentage of variance in the students' entrepreneurship propensity factor. SEPM32 (*I can create a career that provides me with a chance to earn a good deal of money*) recorded the lowest variance of 80.2% (.802) with SEPM22 (*When I realize I cannot reach my goal, I quickly move on to new endeavours*) explaining 97.8% (.978) (see Appendix F).

In summary, the pilot study used explorative factor analysis to retain the dominant variables applicable in the Ghanaian context. Whilst four factors (curriculum-specific technology integration, goal-setting grit scale, general task self-efficacy scores, and need for achievement and risky behaviours scores) produced significant determinant statistics, two (economic locus of control and entrepreneurial competency) factors failed the determinant test due to substantial variables (above 30) entered for the EFA in the pilot study. Table 4 shows remarkable results by retaining 50.59% ($n = 43$) dominant traits measuring CSTI, SGGS, GTSES, and NARB constructs in this pilot study (*see* Table 4 footnote). However, except for the SGGS factor, no attempt was made to rename factors in the pilot data analysis, which is not an objective for EFA use at this stage in the study. Further factor analysis is reserved for determining common themes for the study's interview protocol (Section 3.6). Indeed, significant lessons are drawn from the use of EFA/CFA for counselling testing focused on career development in Ghanaian schools that seek to adopt the dominant Western theories. Thus, guidance and counselling experts need to account for cultural validations of their testing instruments and be conscious of adopting off-the-shelf tests without cultural and environmental variances explained with factor analysis.

3.5.0 Final Questionnaire Design and Factor Conceptualisations

Three considerations can influence the choices of research instruments- i) either developed by the researcher, ii) modified, or iii) adaptation (without modifications) of an existing instrument (Creswell, 2012, p. 157). Each of these choices comes with merits and demerits. For example, it saves costs and makes it easy to adopt an instrument. However, obtaining written authorisation from the authors of the original instrument and establishing cultural validations can be problematic and elaborate. In effect, Creswell recommends constructing a new instrument to measure the variables in a study if none exists in literature or commercially. In the case of the current research, available literature on the constructs (technology adoption, cognitive traits, & entrepreneurship) for answering Research Question 1 is encouraging.

On the other hand, cultural validation reports seem conspicuously missing from the works of significant others such as Weiner et al. (2014). Consequently, the decision to adapt existing instruments and conduct cultural sensitivity tests through a pilot study. This segment presents details of the final instruments (questionnaire and interview protocol) employed with theoretical and philosophical considerations guiding this study.

A questionnaire is a self-report data collection tool often measuring each participant's performance, attitudes, behaviours, interests, information, values, perceptions, personality, beliefs, and intentions in a research project (Johnson & Christensen, 2008, p. 170; Creswell, 2012, p. 156). Questionnaires in entrepreneurship studies have been relatively documented (e.g. Foss, Lyngsei, & Zahra, 2015; Anokhin, Grichnik & Hisrich, 2008; Oosterbeek, Praag, & Jsselstein, 2008; Kalyani & Kumar, 2011). In the current work, similar motifs guided the search for business students' attitudes and cognitive traits with entrepreneurship factor in this study. Hence, the

questionnaire in this study is aptly supported by earlier works measuring participants' views, knowledge, and performances on identified latent variables in the two research questions guiding the study. Besides, a questionnaire allows researchers to reach a large number of respondents whose statistics can be extended to the population parameters and suitable for generalisation (Johnson & Christensen, 2008; Babbie, 2010; Field, 2009).

Based on the pragmatists' views (Teddlie & Tashakkori, 2009; Cohen et al., 2007; Creswell & Clark, 2011) adopted for this study, a questionnaire and interview protocol were used for data collection. The choice of both research instruments for this study was based on the pragmatists' views on knowledge generation, as Creswell (2012) reported. The pragmatists' school of thought has favoured a maximalist approach, which states that one research paradigm does not often provide a holistic solution to investigate a scientific problem. Hence, research components should be mixed in ways one believes would suit a research problem, research questions, and research circumstance (Cohen et al., 2007; Johnson et al., 2008; Babbie, 2012; Creswell, 2012).

Following the mixed method design adopted for this study, seven latent variables were identified based on literature and theory. They were operationalised for relationship testing in line with nomothetic assumptions governing Research Question 1. Similarly, an interview schedule was used for the qualitative data gathering for Research Question 2 in this study. Subsequently, the details of each instrument are presented in the next section.

3.5.1 Factor 1: Curriculum-Specific Technology Integration

A seven-part (Parts A1– D1) questionnaire was developed to collect the quantitative data (see Appendix A) for hypotheses testing based on Figure 1. Students'

competency in curriculum-specific technology integration (CSTI - Factor 1) in the business curriculum was measured using 30 close-ended items (see Table 3). The 30 items were based on the International Society for Technology in Education (ISTE) standards for students (NETS-S) and aligned with Ghana's 2007 educational reform and the ICT4AD Policy recommendations in Part A1 of the survey instrument. The NETS-S comprises six standards for measuring students' technology competency. The standard was developed in the USA and considered relevant for global curriculum-specific ICT integration in education. The standard included the applications of ICTs to foster (i) creativity and innovation, (ii) communication and collaboration, (iii) research and information fluency, (iv) critical thinking, problem-solving, and decision-making, v) digital citizenship, and (vi) technology operations and concepts for students. Specifically, business students' technology integration competency was tested on the six broad categories and described as computer-specific integration literacy (CSTI). However, the CSTI factor constituted the highest deleted questionnaire items, with 35% (n = 18) omitted from the final instrument. As a result, the CSTI factor forms 10% (n = 11) of retained items (fourth highest ranked) in the final data collection items, with 83.6% TVE in this study.

Participants indicated their level of agreement or disagreement with the 11 evaluative statements about the integration of ICT tools into their business curriculum on a 5-point Likert scale [ranging from strongly agree (5) to disagree (1) strongly]. The 18 deleted items were further factor analysed for FGD protocol to ascertain students' views on why such critical technology competencies were not acquired from their business education curriculum at the university level in the Ghanaian setting.

3.5.2 Factor 2: Students' Stages of Technology Adoption

Secondly, Part A2 of the questionnaire required students to indicate their stages

of technology adoption (STA), which is labelled as *Factor 2* using Hall and Hord's (1987) Concerns Based Adoption Model (CBAM model). The survey of business students' stages of ICT adoption based on the CBAM is a single-item self-assessment survey on integrating technology into the business curriculum. Categorically, Rogers' (1995) *DoI* framework of technology integration was employed to measure the *STA Factor* (Appendix C) from the initial seven stages. Rogers elaborately described *DoI* labels as low technology users (Stage 0), majority adopters (Stage 1), late adopters or laggards (Stage 2), moderate technology users and late majority adopters (Stage 3), high technology users (Stage 4), innovators and early majority (Stage 5), and adopters (Stage 6). Indeed, Yidana (2007) used Roger's *DoI* theory to interrogate the findings that classify faculty members' levels of technology integration into their curriculum in the Ghanaian context.

Consequently, the current study also employs Roger's labels to categorise students' technology frameworks for organisational training and curriculum design in business schools. However, the current research omits Hall and Hord's (1987) Stage 0 and, instead of Roger's (1995) six stages of *DoI* descriptions, to measure business students' levels of computer usage in Ghanaian public universities. Stage 1 measured their *awareness* knowledge, while Stage 2 evaluated their *learning process* of computer usage. Stage 3 examined students' understanding and application of the process of computers into curriculum-specific learning, whilst Stage 4 sought learners' familiarity and confidence in integrating computer applications for business processes. Finally, Stage 5 measured students' technology adoption practices in the overall curriculum, and Stage 6 tested creativity in applying computers to new contexts outside their classrooms. Similarly, at universities, the study collapsed Rogers' six scales into three, in conformity with Hall et al.'s (1987) three stages for discriminant analysis in

Hypothesis 4 (see Section 4.1)

Knowing the stages of business students' technology adoption could assist organisations hiring such graduates to organise training programmes that use the findings of students' *DoI* labels as formative assessment tools in the teaching and learning process, thereby cutting costs and deriving value for money. Similarly, university counselling curricula could use such levels as inputs for designing higher-order technology integration programmes to build students' technology capacity for career developers in the knowledge economy.

The use of CBAM in research has been documented with favourable outcomes. Christensen and Knezek (1999) reported that it was a convenient and faster means of determining the average stage of technology adoption. It has substantial implications for the design of technology courses and lecturers' integration of computers in business curricula that meet students' learning needs. Similarly, Yidana (2007) used Rogers' *DoI* stages to evaluate two teacher universities' technology integration programs in Ghana. Finally, Yidana mentions that it allows users (ICT) to assess their technological progress for overall curriculum tasks. Choosing from the six levels (*awareness, learning process, understanding and adoption of the process, familiarity and confidence, and creative application to new contexts*), participants were required to select a level that best describes their current computer usage as business students.

In contrast, Parts B1 to B4 of the questionnaire for this study investigated final-year business students' cognitive traits with their behaviour on entrepreneurial propensity in Ghanaian public universities. For illustration, Damon and Lerner (2008) found relationships between some individuals' traits such as self-efficacy, openness to new experiences, agreeableness, internal self-regulation skills, curiosity, creativity, diligence, future orientation, and reliability and entrepreneurship inclination in Western

cultures. Therefore, the current study seeks to extend knowledge on cognitive traits from the Ghanaian perspective using graduating business students from business schools, given their relevance in the knowledge economy with high-speed Internet connectivity that changes jobs (Thompson Jr. et al., 2005) and shrinking space in education (Elloumi, 2004) that hold significant implications for Ghanaian career development experts.

3.5.3 Factor 3: General Task Self-Efficacy

This study adopted a 5-point Likert scale (ranging from 1 = Strongly Disagree to 5 = Strongly Agree) to measure students' self-efficacy traits. Specifically, Part B1 required respondents to rate the extent of their agreements on 13 questionnaire items measuring general task self-efficacy (*Factor 3*). The 13 items were based on factor-retained items in Section 3.4 using Bandura's (1989) perceived self-efficacy theory emanating from his original works on the *Regulation of Cognitive Processes* concept. Varieties of issues (belief in the self-concept, taking personal responsibility for accomplishing assignments, and social skills) were covered. Therefore, the current study refers to the instrument as 'general task self-efficacy' (GTSE). Originally, Bandura scored the items with a dichotomous scale (*low* and *high*) on the original 22-item questionnaire with eight items (2, 3, 4, 6, 7, 12, 17, & 20) reverse worded and scored '*low*'. In this study, only two original items were negatively worded (GTSE6 & GTSE7), retained, reversed, scored and analysed using IBM SPSS Version 23.

3.5.4 Factor 4: Students' Grit Goal-Setting Construct

Part B2 adapted Duckworth, Peterson, Matthews, and Kelly's (2007) grit goal-setting scale to predict business students' perseverance and passion for long-term goal achievements. Duckworth et al. explained that grit entails one's ability to persevere and strenuously crave longstanding objectives despite failure, adversity, and plateaus in

progress (pp. 1087-1088). The Grit Scale was developed to provide face validity in measuring adults' perseverance traits as opposed to the only available Lufi and Cohen's (1987) Perseverance Scale for Children. Justifying the development of the Grit Scale, Duckworth et al. also listed some related measures of perseverance, such as the Tenacity Scale (Baum & Locke (2004), which were crafted from Gartner, Gatewood, and Shaver's (1991) original work measuring entrepreneurial perseverance. However, Duckworth et al.'s findings lack construct and face validity for adolescents, such as graduates leaving business schools. Seventeen items were screened with exploratory factor analysis (EFA) from the original 27 items, which were subjected to face and construct validations by the developers (Duckworth et al., 2007, p. 1090). Twelve factors were retained after the *promax rotation*, with six items loading on the perseverance of efforts factor and the remaining items on the consistency of interest, using 772 online research participants. Duckworth and associates found that the resultant 12-item Grit Scale displayed high internal consistency ($\alpha = .85$) for the overall scale, whilst the two sub-scales recorded Cronbach's alpha (α) of .78 for Perseverance of Effort and .84 for Consistency of Interests.

In the current study, the original 17-item Grit Scale of Duckworth et al. (2007) was expanded to 20 to measure business students' perseverance of effort and consistency of interest in personal life, academic work, and tendency to exhibit mental fortitudes in different task accomplishments. After validity checks on the initial 20 items scale, exploratory and confirmatory factor analyses retained nine items with internal consistency scores (alpha) between .47 and .90. In addition, three factors were loaded using orthogonal rotation (CFA) and labelled as (1) *Goal Perseverance*, (2) *Goal Focus*, and (3) *Goal Resource Preparedness*. As stated earlier (*see* Section 3.4.3), only the overall internal consistency of the Grit Scale was of interest to the theoretical and

conceptual framework (Figure 1) guiding this study, except for confirmatory or supplementary analysis reasons depending on the statistical model but not in sub-dimensions detected in the factor loadings for the SGGS scale.

Therefore, respondents were required to rate their frequencies of exhibiting Grit behaviour (see Duckworth et al., 2007). Four items (SGGS4, SGGS6, SGGS9, & SGGS19) on the newly constructed Grit Scale for the current work were reverse scored (i.e. 5 to 1) for further statistical analysis. The student's grit goal-setting (SGGS) variable was labelled as *Factor 4 for relationship testing*.

3.5.5 Need for Achievement and Risk-Taking Constructs

Based on practical expediency and due to the relatively small number of items measuring students' need for achievement and risky behaviours, the two factors were grouped during questionnaire construction and EFA/CFA analysis stages. The constructed factors were perfectly loaded on two axes using orthogonal rotation and were labelled as (1) student' need for achievement (nAch) and (2) student's demanding tasks risks (SDTR) in this study. Out of the nine items retained from the CFA output, six loaded on the need for achievement (nAch) as *Factor 5*, whilst three (sufficient for factor analysis) loaded on students' risk-taking behaviour scores (RTBS) as *Factor 6*. Similarly, a 5-point Likert Scale (5 = *strongly agree* to 1 = *strongly disagree*) was used to rate students' display of the two cognitive traits (need for achievement and risk-taking propensity) in this study. Out of the three risky behavioural items likely to produce favourable outcomes, two (RTBS7 & RTBS12) were negatively worded and reverse scored as such for final analysis. Factors 5 and 6 were constructed based on McClelland's (1940) tried-and-tested *Need Theory* and Reyna and Brainerd's (1995) *Fuzzy-Trace Theory* (within the dominant risk-taking theory). However, see Section 2.9 for a comprehensive review of the theoretical models underpinning Factors 5 and 6 in

this study.

3.5.6 Factor 7: Economic Locus of Control

The questionnaire further tested students' attitudes and beliefs on economic activities while leaving school. Economic activities are believed to significantly relate to the entrepreneurial process (Daily et al., 2002; De Carolis, 2003). Consequently, Furnham's (1986) Economic Locus of Control (ELCM = *Factor 7*) instrument with the original 40 items was adapted to measure the ELCM construct amongst business students in Ghanaian public universities. Though some students might not be earning salaries, they might receive stipends from different sources, and how they handle these incomes could have a relationship with the entrepreneurial propensity in this study. Upon computing the EFA on the pilot data, eight factors (e.g. items - ELCM9, ELCM10, ELCM22, ELCM25, ELCM26, and ELCM30) recorded KMO values less than the 0.5 coefficient concerning Kaiser's (1970) criterion. Therefore, 32 factor-retained items (*see* Section 3.4.6) were used for the final data collection. Furnham reported five sub-dimensions of the ECLM as (i) Internal Chance, (ii) External Chance, (iii) Powerful others, (iv) Provider Control and (v) Nature of the Problem. Though not the intention of this study to isolate factors under the ELCM, the EFA results produced four factors (Appendix E) similar to Sakalki, Kanellaki, and Richardson (2009), who also reported four factors using seven-point Likert-type scales to measure relationships between Machiavellianism, economic opportunism, and economic locus of control. The ELCM seems to have enjoyed some cultural validations with the Black Southern African group with strong validity and reliability results (Van Dalen, Van Niekerk, & Pottas, 1987).

3.5.7 Factor 8: Entrepreneurship Career Choice Construct

However, the students' entrepreneurship propensity measure (SEPM: *Factor 8*)

adopted Weiner, Geldhof, and Lerner's (2014) *Entrepreneurship Intentional Self-Regulation (EISR) Questionnaire*. The original questionnaire contained 6-parts (selection, optimisation, compensation, loss-based selection, entrepreneurial activities, and entrepreneurship career value) to measure youth entrepreneurship intentions and values under the auspices of the Institute for Applied Research in Youth Development at Tufts University, USA. As a newly constructed instrument, the authors did not report a comprehensive validity (e.g. cultural fit, reliability, and ecological suitability) for comparative analysis. Hence, the current study decided to subject the EISR instrument to further validation in the Ghanaian context, using final-year university students from business education departments. Besides, this study employed the Theory of Planned Behaviour to operationalise *Factor 8*. Based on the pilot study's EFA reports (Section 3.4.6), three items failed to meet the KMO criterion of 0.5 and were consequently deleted.

The EISR measure sought to predict business students' tendencies to exhibit entrepreneurial traits (propensity) on eight sub-dimensions (as extracted in the pilot study; see Appendix F) in this study. The final instrument administered retained 89% (n = 34) items (see Table 3) from the pilot study with seven factors (Appendix F). The adopted version of Weiner et al.'s EISR questionnaire produced eight-factor loadings using CFA in IBM SPSS Statistics Version 23. Internal consistency scores created for the overall factor on the pilot and final instrument administration were reported in Section 3.6 for further hypothesis testing in this study. For each item, respondents rated the frequency of engagement in entrepreneurship propensity measure on a scale ranging from 1 = 'Never' to 6 = 'Always.' However, the current study considers Weiner et al.'s (2014) six-response scale as an over-generalisation of the student's entrepreneurship propensity behaviour since literature shows that not every individual tends to exhibit

the trait (e.g. Baum et al., 2007). Therefore, the adopted six scales were collapsed into three sub-categories – low, moderate, and high. The Responses 1 and 2 used by Weiner et al. were collapsed into Level 1 (*low awareness*), 3 and 4 as Level 2 (*moderate*), as well as 5 and 6 as Level 3 (*high*) based on Ajzen's (2005: 5) conative responses measure. Ajzen describes an individual's negative or positive attitudes, behavioural inclinations, intentions, commitments, and actions concerning the attitude object as a conative response, however, imagined. Hence, the 33 items measuring students' entrepreneurship latent variable were imaginations driven by cognitive traits and environmental factors that the respondents might be exposed to. At best, Ajzen refers to measures of this nature as latent hypothetical constructs manifesting themselves in various observable responses.

Appendix L shows the categorisation of the SEPM factor according to university, with 50% (n = 351) of students from the three campuses constituting a moderate entrepreneurship level. The low entrepreneurship awareness group were 36% (n = 255), and students with high entrepreneurship propensity represented 15% (n = 103) of the samples for this study.

Finally, 13 students' demographic data were collected in Part D1 to test Research Question 1. Variables such as sex, university, age, academic programme, career choice, leadership positions, entrepreneurship seminars attended, nationality, birth order, ethnicity, religion, parenting style, economic background, ICT access, and ideal employment sector were measured in this study. These demographic variables are based on literature predicting the influences of personal attributes such as age (Damon & Lerner, 2008; Sergeant & Crawford, 2001), gender (Geldhof et al., 2014), and authoritative parentage (Schmitt-Rodermund, 2004) influence on entrepreneurship traits.

3.6.0 Interview Protocol Design Using Factor Analysis

Another EFA was conducted on the 18 rejected items measuring the CSTI factor (Table 3) to determine common themes for the focus group discussions (FGDs) using rural participatory appraisal (RPA) described in an ethnographic work of Chambers (1994). Thus, those items that did not load above the .4 criterion (Kaiser, 1974; Field, 2009), as reported in Section 3.4.1, were further subjected to CFA analysis to establish commonalities and component loadings. The factor loadings obtained from the 18 deleted questionnaire items for CSTI (see Appendix G) with coefficients between .46 and .89 and KMO value of .34 ($p < .05$). In addition, the 18 deleted items loaded highly on six components, explaining 81.55% of variance in the technology integration construct. However, only three components loaded more than three items and were labelled as (1) integration literacy, (2) electronic publication skills, and (3) multimedia presentation competency (see Appendix G for details). The study chose the CSTI factor as one of the themes explored in the FGD.

Four overarching themes (Appendix D2) were explored in the interview protocol. The themes were (1) views on business curriculum (education), (2) general entrepreneurship concepts, (3) curriculum-specific technology integration in business curriculum, and (4) indigenous knowledge systems (IKS). However, detailed interview schedules and follow-up questions are presented in Appendix D1. Thirty supplementary questions were explored from the four themes that yielded 28 pages of narrative data (see *Sample Interview Transcript* in Appendix D5).

3.7.0 Validity and Reliability of Research Instruments

The objective of validity in interpretive research “is not to verify a correct answer but rather to convince the reader” of the trustworthiness of a narrative (Wang & Jessup, 2014, p. 169). Hence, the study used different approaches to achieve survey

and interview data validity. This section presents the questionnaire's psychometric properties and FGD schedule for data collection in this study. Both instruments were subjected to different types of validity and reliability checks to ensure that the identified constructs reflect the attributes of participants in this study. The term validity has a conventional usage that simply refers to how empirical measures sufficiently represent a latent factor (Babbie, 2010, p. 153). Some even use the concept of 'validation' to reflect checking both internal consistency (reliability) and construct representation (validity) in the research literature (Creswell, 2012). Hence, such diverse conceptions of validity have led Cohen et al. (2007, p. 132) to categorise it as either quantitatively (careful sampling, proper instrumentation and statistical models selection, and controlling for extraneous variables) or qualitative practices such as honesty, trustworthiness, depth, scope, richness of data, bracketing, and level of triangulation).

However, in this study, the two terms are mutually exclusive. Heuristic considerations of relevant criterion, content, ecological, cultural, and criterion validity were explained with the survey data, whilst trustworthiness, participant consent, environmental concern, and interpretive validity were also justified. This section ends with Cronbach's alpha approach to check the internal consistency of the seven factors with the number of questionnaire items and decisions considered if an individual item's reliability coefficients tend to bias the overall alpha on any of the factors.

According to Pallant (2005: 90), checks for internal consistency (reliability), using Cronbach's alpha coefficient (α), have been widely measured for behaviours or events in the social sciences. Conventionally, social scientists recommend that internal reliability should be ideal with a .7 Cronbach alpha (Field, 2009). However, Cronbach's alpha tends to be affected by sample size and item numbers on a scale. Shorter items less than 10 might produce weak Cronbach alpha values. Hence, Pallant states that the

mean inter-item correlations should be reported in this case, with Briggs and Cheek (1986) recommending .2 to .4 inter-item coefficient considerations. Consequently, this study examines respondents' understanding of items on the questionnaire as a reflection of valid measures of the seven metric constructs (CSTI, GTSE, SGGS, nAch, RTBS, ELCM, & SEPM) in comparison with the pilot data reliability test (Figure 3) with 709 samples from three randomised public universities.

Aside from computing overall internal consistency, the study checked for inter-item correlation matrix and *scale if the item deleted* for the seven latent factors. Field (2009, p. 678) specifies that *Corrected Item-Total Correlation* (a measure of the relationship between individual items and the overall score from the test item) should be judged reliable with a Cronbach alpha coefficient of .3 and above; else, the item should be deleted. A crucial decision that has yet to be made, such as keeping or deleting items from a test in reliability check following EFA, is checking for *Cronbach's Alpha If item Deleted* option in the IBM SPSS Statistics Version 23 package. The field provides a relief that if the overall alpha for a factor exceeds .8, a deletion of an item should not be a problem in questionnaire construction. The IBM SPSS Statistical package provides users with a table of overall Cronbach alpha, compares the individual items, and decides how the omission of each item could improve the overall alpha (Pallant, 2005). An indication of weak item loadings was appropriately noted for subsequent statistical analysis since poorly correlated items might affect the power of detecting an effect in the statistical models, particularly parametric statistical tools. Table 4 shows the results of reliability checks for the seven metric factors using Cronbach's alpha coefficients.

The average number of items per the seven constructs was 15.23, with the total number of questionnaire items for data collection as 107. All constructs meet the .7

coefficient criterion (Field, 2009; Pallant, 2005) as good indicators of internal consistencies amongst items measuring the seven endogenous variables in this study. In addition, seven individual items measuring CSTI, GTSE, SGGs, nAch, and RTBS posed problems for their overall Cronbach alpha figures, as shown in Table 9. Though Field recommends $\alpha = .8$ not being a problem, a conservative alpha between .5 and .7 might not be poor for newly investigated cognitive constructs in a Ghanaian setting. The self-efficacy factor draws close to the .5 criterion, considering the ecological validation of such a measure. Indeed, why students scored low on GTSE could be of interest in further study in the Ghanaian context. However, inspection of internal reliability alphas revealed that *Corrected Item-Total Correlation* and *Cronbach's Alpha if Item Deleted* indices for CSTI Factor (Appendix H2), GTSE Factor (Appendix H3), ELCM Factor (Appendix H4), and nAch Factor (Appendix H5) were not in conflict. Curiously, the RTBS Factor (Appendix H6^b) reported that one item (*I try to do my job as well as possible even when the tasks assigned to me are difficult*) violated the internal consistency rating with $\alpha = .093$ in favour of *Cronbach's Alpha if Item Deleted*.

Table 9 : Cronbach's Alpha for Final and Piloted Questionnaire

S/N Factor	Final [F]	Pilot [P]	Items if Deleted			
	Cronbach's Alpha [Overall]	Cronbach's Alpha [Overall]	P-F Diff.	N of Items	Item	Alpha
1. CSTI	.865	.859	-0.006	11	CSTI21	0.868
2. GTSE	.620	.856	.236	13	[GTSE7; & GTSE9]	[.704; & .717]
3. SGGs	.470	.834	.364	9	[SGGS4; SGGs9; & SGGs20]	[.474; .472; & .471]
4. nAch	.819	.933	.114	6	nAch6	0.836
5. RTBS	.719	.943	.224	3	RTBS12	0.745
6. ELCM	.768	.913	.145	32	N/A	N/A
7. SEPM	.931	.956	.025	33	N/A	N/A
Average	.742	.899	0.157	15.286		

Source: Survey data, 2016.

Pilot (N = 54); Final Instrument (N = 709)

Note: ELCM and SEPM Factors did not produce inter-correlation tables for Item-Total Statistics due to the challenge (30+1). IBM SPSS Statistics produced factor scores for items of more than 30. N/A - no items were deleted for ELCM and SEPM factors during the pilot study phase. Total number of items = 107.

Finally, comparing the final instrument's reliability scores with the pilot study from Table 4, the .157 average (.899 to .742) differential can be described as superb of the seven constructs among graduates in the selected Ghanaian public universities, according to Hutcheson et al. (1999) evaluation. Hence, cultural validity might not be a problem for the final data analysis for comparative study. Above all, except the CSTI Factor gaining a .006 coefficient value from the final survey, the remaining six constructs lost between .025 (SEPM) and .365 (SGGS) reliability values (see P-F Diff.). This study shares some of the reasons advanced by Cohen et al. (2007), Babbie (2010), and Creswell (2012) that respondents' lack of clarity in understanding items, criterion and content validity, social desirability effects, time, indifference, and items not culturally validated might affect loss of reliability coefficients in the current study as well.

Finally, validity checks for the interview data were done by significant others in the fields of psychology, management, technology, and educational administration. My supervisors and colleagues also assisted in providing feedback on the pilot and final questionnaires and the interview schedule in this study. Fundamentally, the RPA approach during the interview sessions allowed member checking where discussants either confirmed or rebuffed submissions by peers on themes discussed in this study. Ecological validity was adhered to by interviewing participants in the school environment, and questionnaires were also answered in classroom settings.

3.8.0: Survey Data Analysis Approach

Significant testing in entrepreneurship research reveals patchy and camouflaged statistical reportage in the literature that sought to obfuscate the reality. Notable amongst such misleading reports is witnessed in the works of Klapper, Amit, and Guillén (2010, pp. 140-141) with bubble graph to show firm density and per capita using a World Bank Group Entrepreneurship Database (2008) and World Bank (2009) report and concluded, “a significant relationship” existed between the two linear factors. So, what is done differently in this study? Multivariate tools were used to predict technological, cognitive, and demographic factors likely to account for students’ entrepreneurship propensity. Jain (2011) highlights such an analytical gap in the entrepreneurship literature and recommends multivariate statistical tools. Adherence to Jain’s analytical gap in the entrepreneurship literature, multivariate models enabled the current study to account for the significant variation of predictors in the entrepreneurship propensity factor.

The ultimate objective for Research Objective 1 (RO1) was to achieve statistical power with multivariate statistics models. Statistical power is the probability of a test identifying a treatment effect resulting from matching variables in a conceptual model (Howitt & Cramer, 2011). In other words, the choice of statistical test for analysing a hypothesis should be able to explain a large percentage of variances in the dependent factor using observed data within the principles of null significant hypothesis testing (NSHT) that accounts for the model’s strength in producing results (Hair, Jr., 2006; Dancy & Reidy, 2011). Also, NSHTS regulations guided the data analysis in this study (Section 3.10). Statistically, models fitted to the sample data in this study were based on rigorous assumptions testing (see Section 3.10).

Therefore, descriptive and inferential statistical models were used to test RO1

in line with positivists' (quantitative) epistemology to scientific inquiry. Positivism believes that events or phenomena are explained best numerically in parallel to scientific experimentation, a view expressed by Giddens (1975) when outlining the tenets of positivism as a research paradigm. According to Giddens' suppositions, experimentation is at the heart of positivists' research design and analysis.

Testing relationships between factors identified in a study using inferential statistics helps researchers establish the probability that observed mean scores might accurately represent a particular population due to chance or sampling error (Field, 2009; Dancy & Reidy, 2011). Inferential statistics enable quantitative researchers to test relationships, predict, or explain outcome variables as significant or non-significant due to chance (Howitt & Cramer: 93; Black, 2010).

Consequently, a series of null and alternate hypotheses formulated from Research Question 1 were tested within the (conventional social sciences') 95% CI (α) as a decision rule. Setting alpha values for hypothesis testing often controls for *Type I* and *Type II* errors in an experimental design (Field, 2009). According to Black (2010: 298), *Type I* error is committed in hypothesis testing by rejecting a true null hypothesis (no effect produced by the experimental variable), whilst *Type II* error occurs because researchers fail to reject a false null hypothesis (rejecting genuine effect). Black also advises researchers to set the alpha value before experimentation or a study to minimise *Type I* errors and *Type II*. Because of Black's recommendation, the study used an alpha value of .05 (95% CI) conventionally adopted in social science research (Johnson et al., 2008; Field, 2009; Cohen et al., 2007) for all hypotheses testing in the current study.

From RO₁, four hypotheses (Section 1.4) emerged using multivariate approaches. Multivariate approaches allow researchers to test relationships between multiple variables and be able to observe both individual and collective interactions on

dependent factors (Hair Jr. et al., 2014). They also have the power to detect effects easily compared with univariate techniques (Heiman, 2011). Hypothetico-deductive practices mainly guided the construction of the *Theoretical and Conceptual Framework* (Figure 1), which offered statistical tool selections for this study. Behavioural studies often involve the study of several constructs to detect effects on attitudes and behaviour (Jackson, 2009). An academic field like entrepreneurship studies has struggled to achieve parsimony in estimating maximum-likelihood factors accounting for the construct (Jain, 2011). Later studies in entrepreneurship research that attempted to use multiple factors emerged following the recommendation of others, such as Jain. For instance, Ali and Kamble (2015) investigated how six cognitive constructs, such as risk-taking intention, achievement motivation, market orientation, locus of control, proactiveness, and innovativeness, were used to account for owner-managers and intrapreneurs' intentions. However, their analysis still employed univariate tools such as t-test and ANOVA with familywise errors likely to weaken the power of predicting factors in combination.

Based on the results of normality, equality of variances, and linearity, which are prerequisites (Section 3.10.0) for general linear models (GLMs), two (goal-setting & economic locus of control) of the cognitive factors did not pass their assumptions testing. However, considering the robustness of multivariate approaches (Jackson S. L., 2009), this study adopted a one-way multivariate analysis of covariance (one-way MANCOVA) for Hypothesis 1 (H_{o1}), hierarchical loglinear analysis (HLA) for Hypotheses 2 and 3 (H_{o2} and H_{o3}), and hierarchical logistic regression (HLR) for hypothesis 4 (H_{o4}) as constituents of the Research Question 1.

Multivariate statistics are more robust in detecting effects and power in the outcome factors (Pallant, 2005). Hair Jr. et al. (2014) suggest multivariate tests such as

MANCOVA for experimental designs in which researchers directly manipulate covariates to predict outcome variables for observed effects. However, multivariate tests have been recommended for survey data and other social and behavioural data (Field, 2009; Shaughnessy, Zechmeister, & Zechmeister, 2012). Therefore, using a survey approach involving several constructs in this study (Section 3.1), multivariate statistics were most suitable for answering RO1. Specifically, one-way MANCOVA was used to test H_{01} , which predicts students' cognitive factors from their entrepreneurship propensity levels whilst controlling for CSTI as a covariate or mediating variable. This study measured Entrepreneurial propensity at three levels (Section 3.5). According to Field (2009: pp. 396-397), the covariates in the ANCOVA model allow researchers to reduce within-group error variances in the predictor variable (SEPM) and elimination of third variables (confounds) that may be unmeasured but varied systematically with the experimental effects and the dependent factor. Therefore, the MANCOVA model's CSTI factor as a covariate aptly justifies an intention to control confounds in this study.

Besides, the extant literature argues that entrepreneurship skills development does not pertain to every member of a particular population, as Thompson (2009) suggested that personal and institutional conditions might influence an individual's level of development. Thompson's view aligns with the environmental determinist's (Nicolaou, Shane, Cherkas, & Hunkin, 2008) position as an essential variable in the study of entrepreneurs. As students' socio-economic backgrounds differed, this might affect their levels of entrepreneurship development differently. Describing every student as an entrepreneur might be misleading since an individual's stages of growth could be attributed to socio-cultural factors that promote or militate against entrepreneurship career decision-making. Hence, the current study classified

entrepreneurship career choice into three levels to enable it to explore error variances for relationship testing on scales of ‘low’, ‘moderate’, and ‘high’ entrepreneurship awareness (Section 3.5.7). The categorisation of the entrepreneurship construct enabled the study to explore the characteristics of each level of entrepreneurship intention and how their mean scores predict the five cognitive factors in the one-way MANCOVA model using the CSTI Factor as a covariate.

In quantitative analysis, Vogt (1999) explains that a mediator refers to a variable transmitting the effects of another variable and attempts to account for a relationship between other variables. Consequently, the CSTI factor was used as a mediator to control for the impact of the independent variable (SEPM). Describing MANCOVA as a statistical model, Hair et al. (2014: 684-682) state that this involves “...blocking a factor to control for influences on the dependent variable that are not part of the research design” but should be explained in the final model. The covariate will likely introduce bias or a source of extraneous variable contaminating the dependent factor controlled for in this circumstance by using ANCOVA or MANCOVA (Field, 2009; Tabachnick & Fidell, 2013). Conversely, MANCOVA tests examine the overall relationship between the outcome factors and the covariate. A regression line fitted to the observed data assumes a positive relationship for all the predictor groups (SEPM Levels). However, a negative relationship between the covariate and the experimental effect depicts a significant variation in groups (SEPM Levels) mean scores (homogeneity of regression slope test), thereby nullifying the overall regression model (Field, 2009, p. 399). The choice of CSTI as an intervening variable in the MANCOVA model for this study is also premised on the ground that technology and entrepreneurship activities are gaining attention among academics and stakeholders as transformative tools (e.g. Geldhof et al., 2014; Williams & Youssef, 2015).

Others submit that information and communication technologies (ICTs) are high-powered conduits fostering entrepreneurship thinking and efficiency by reducing bureaucratic systems, spearheading organisational innovations, and creating diversity (Collin & Watts, 1996; Peavy, 1997; Santos, 2004; Hosseini, Lashgaara, & Hosseini, 2014). For instance, Hosseini et al. argue that the Internet is the most crucial communication network supporting business-to-business interactivity. Similarly, Thompson Jr. et al. (2005) stressed the role of ICTs in competition leverage for organisations. Presumably, acquiring ICT skills could be equated with generating 'newness' and 'innovative thinking' for entrepreneurs. Newness and creative thinking are key constructs explaining entrepreneurship activities (Spencer et al. 2008). Both terms invariably reflect mixed understandings with 'newness' and 'creativity' concepts associated with them. Therefore, the tendency for obfuscation might be high, which informs the current study to isolate them in the MANCOVA model. Above all, the current research assumes that using CSTI as a predictor variable could bias the final model for H_0I .

In addition, four different statistics for MANCOVA guided the study based on Field's (2009: 604) discussion on the impact of small to moderate sample size variations in multivariate statistical models. For instance, if group differences are around the first variate in the model, Roy's Largest Root statistics should be interpreted, followed by Hotelling's Trace, Wilks' Lambda, and Pillai's Trace. On the other hand, when the MANCOVA test observes that along more than one variate, the power of ordering is the reverse of the small to moderate sample size.

It is an observed position of this study that the standardized format for reporting MANCOVA statistics innocuously seems to have received sublime attention in the research methods and statistics texts (see Pallant, 2005; Kantowitz, Roediger, & Elmes,

2009; Gaur & Gaur, 2009; Jackson, 2009; Babbie, 2010; Black, 2010; Creswell, 2012) to a mere mention in passing (Field, 2009, p. 641). However, several such texts in research methods for social scientists have extensively covered univariate statistical models such as t-test, chi-square, ANOVAs, ANCOVA, regressions, and correlations (see Black, 2010; Heiman, 2011), with few discussing multivariate statistics such as MANCOVA, logistic regression, multilevel analysis, and loglinear analysis (Field, 2009; Tabachnick & Fidell, 2013; Hair Jr. et al., 2014). In effect, the study adopts an integrative approach by merging the statistical procedures of ANCOVA and MANCOVA to account for *partialling* out the covariate (CSTI) while predicting the outcome factors (cognition) from the predictors (SEPM propensity). Section 3.9.1 discusses some relevant conditions for MANCOVA in testing H_0I in this study.

3.8.1 MANCOVA Assumptions for Hypothesis 1

MANCOVA is an extension of ANOVA, ANCOVA, and MANCOVA with multiple dependent variables (Tabachnick & Fidell, 2013). Thus, many assumptions covering parametric statistics such as ANOVA, ANCOVA, and MANOVA specifically extend to MANCOVA (Field, 2009). Therefore, the assumptions of linearity, independent of scores, matrix data, randomisation, and equality of variances apply to MANCOVA. Likewise, Field reminds us that multiple ANOVAs instead of deploying a multivariate model could deprive scholar-practitioners of some nuanced emergent findings. Findings such as an interaction between the dependent constructs and the power to detect unique contributions of the combined effects could be lost in an ANOVA with familywise errors introduced in the model that often weaken the predictive power. H_0I could have been analysed with five separate ANOVAs with entrepreneurship levels as predictor groupings since the cognitive factors are five (goal-setting, self-efficacy, locus of control, need for achievement, and risk-taking

propensity). With the conventional social sciences use of α (.05), a 25% margin of error could be introduced in this scenario. In addition, multivariate statistical tools such as MANCOVA and MANOVA are saddled with stringent assumptions that make them robust. Therefore, this study explores some critical assumptions for building confidence in the final model predicting students' entrepreneurship propensity scores using survey data. These are: (i) independence test for experimental variables, (ii) homogeneity of regression slopes, (iii) equality of covariance matrix, and (iv) post-hoc considerations for the final model.

3.9.1.1 Independence Test for the Experimental Variable (SEPM)

MANCOVA focuses on curtailing within-group error variance with a covariate accounting for some of this error variance (Field, 2009). Field further explains that the covariate and the experimental variables must be independent of each other - independence of predictor (SEPM Level) and covariates (CSTI). The covariate tends to be an extraneous variable, biasing the experimental effect when the independence assumption is violated in MANCOVA. Statistically, the covariate tends to explain some error variances, which reduces the chance of detecting an impact due to the experimental manipulation with compromised and spurious interpretation (Wildt & Ahtola, 1978). Field (2009:298) recommends randomisation and matching experimental groups to the covariate to avoid such spurious interpretations from biased independence scores in an experimental design. Also, statisticians believe that the overall multivariate tests such as one-way MANCOVA can protect against inflated Type 1 error rates or familywise errors that characterised repeated univariate statistics as in the case of multiple t-tests.

Using a graphical approach, Figure 4 depicts a box plot of mean relationships and independence between the experimental variable (SEPM Levels) and the covariate

(CSTI) in this study before running the one-way MANCOVA tests. Visually, mean scores obtained by students seem to increase as they score higher on the entrepreneurship propensity measure with few outliers.

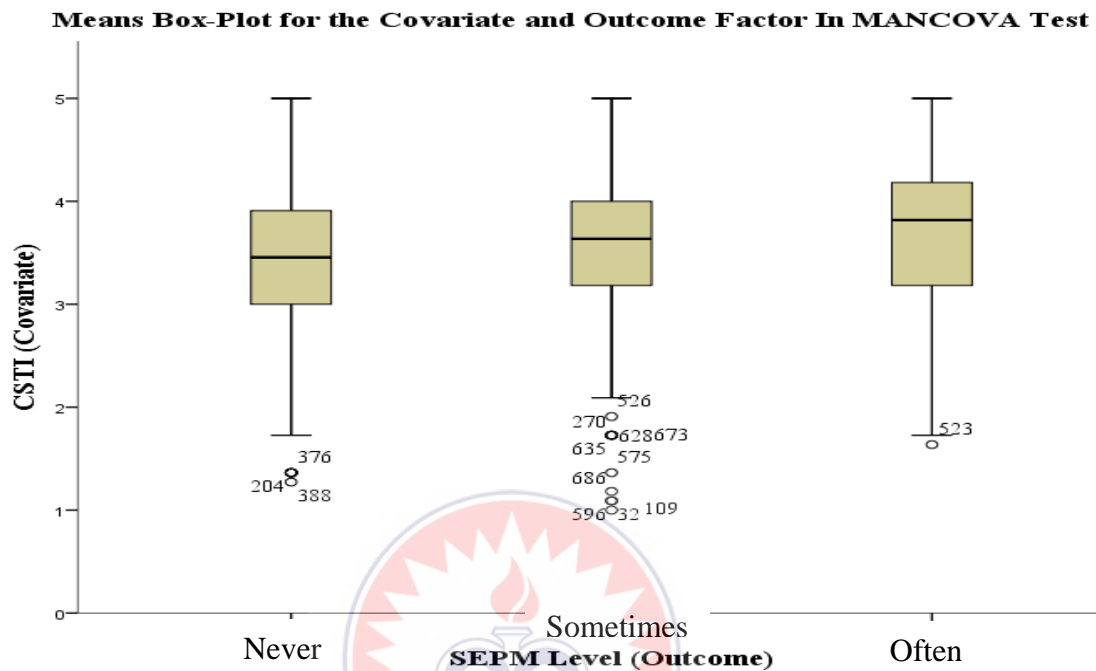


Figure 6: Box plots for CSTI' and independence of experimental effects

Indeed, it is pretty challenging to state how many variance errors exist in the experimental factor examining the box plots alone since descriptive statistics is limited in that respect (Howitt & Cramer, 2011). In effect, the test of independence was conducted using chi-square statistics (Appendix H8). Beyond the visual representation of the independence of experimental groups on the covariate, Field (2009) recommends chi-square and ANOVA. In this study, three levels of the experimental effect were measured with the CSTI factor on a 5-point scale. Therefore, the chi-square test of independence and one-way ANOVA tests were suitable in this case. Indeed, the results showed that there were statistically significant differences ($\chi^2(110) = 206.727, p = .001$) between the three levels of entrepreneurship propensity and covariate (CSTI) using chi-square. For the confirmatory purpose, the study used a one-way ANOVA test as

recommended by Field. It established that the three groups (*Moderate, Low, and high*) differed statistically ($F(2) = 4.2, p < .05$) with their scores on the covariate (see Appendix H9). Since randomisation and matching (*see* Figure 1) were taken into account for MANCOVA, the study concludes that the assumption of independence of scores is tenable in this study since students' SEPM propensity category (experimental effect) is independent of CSTI (covariate) factor.

3.9.1.2 Homogeneity test for Covariate and Outcome Factor

Secondly, the test of homogeneity of regression slopes was carried out on the outcome variable (GTSE, SGGS, ELCM, nAch, and RTBS) and the covariate (CSTI Factor) using an interaction effects procedure in MANCOVA. Homogeneity of covariance matrices tests the null hypothesis that conservatively, deviations on dependent variables are equal to the exact correlation between them (Shaughnessy, Zechmeister, & Zechmeister, 2012). The homogeneity test uses F -statistics to estimate the population variance error between the experimental effect and the covariates (Howell, 2010). Appendix H7 shows that the effects of the cognitive traits and CSTI Factor were all statistically significant: GTSE ($F(5) = 24.28, p < .05$); SGGS ($F(5) = 8.08, p < .05$); ELCM ($F(5) = 6.85, p < .05$); nAch ($F(5) = 14.01, p < .05$); and RTBS ($F(5) = 3.38, p < .05$) in this study.

However, except for the GTSE factor ($F(2) = 3.64, p < .05$), the interaction between the covariate and the outcome factors (Cognitive) passed the homogeneity of regression slopes test for this study (Appendix H7). Non-significant mean scores were obtained for outcome factors with the covariate. Thus, SGSS ($F(2) = 1.164, p > .05$); nAch ($F(2) = 2.11, p > .05$); ELCM ($F(2) = .147, p > .05$); and RTBS ($F(2) = .248, p > .05$). More importantly, the current finding with the one-way ANOVA computation confirms the confidence in the data that indeed, the CSTI factor as a covariate in the

one-way MANCOVA model is tenable in the current the study.

Regarding the number of outcome factors in multivariate statistical models like MANOVA, Stevens (1980) believes no more than 10 should be used except for large sample sizes. Unfortunately, what constitutes a large sample size for MANOVA seems missing in Stevens' manuscript. Therefore, this study used five dependent factors - within acceptable limits by Stevens. In conclusion, the average level of students' means scores on SGGS, nAch, ELCM, and RTBS were the same across the three levels of the entrepreneurship propensity measure. Hence, the four cognitive factors were considered suitable for the MANCOVA model (Section 4.2). However, students' deviations in the self-efficacy factor in the current study raised issues regarding parenting and guidance roles in the Ghanaian setting. Finally, the GTSE factor was added to the MANCOVA model for explorative purposes despite failing the homogeneity of the covariance test.

3.9.1.3 Equality of Covariance Matrix Test for Dependent Factor

Another essential assumption underlying MANCOVA is multivariate normality within a group of dependent variables, a procedure not alien to ANOVA and other univariate statistics. Multivariate normality in MANOVA and MANCOVA assumes that, collectively, the dependent variables are normally distributed within each experimental group (Field, 2009, p. 603). Field points out that though univariate normality is an essential condition for multivariate normality, it is not an easy process for computation using statistical packages like IBM SPSS Statistics Version 23, initially developed by Hull and Nie (1986). Hence, researchers could systematically check normality assumptions using the univariate approach for each dependent variable. Based on Field's advice, this study used ANOVA, chi-square, and t-test statistics for error variance analysis for univariate tests alongside multivariate normality. For instance, apart from Box's test for homogeneity of covariance matrices between groups

(Appendix 10), Leven's test of equality of variances errors that use the F -test (Healey, 2009) for the experimental effects (SEPM Levels) was examined first in this study as univariate diagnostics with the survey data.

Indeed, Box's test is proposed for the homogeneity of covariance test in multivariate statistics (Field, 2009). Suppose the groups' deviations around their respective means are equal. In that case, the Box's test is expected to produce $p > .05$, which signifies that the groups' variations across the dependent variables (cognition) are the same. Statistically, the Box's test results from the survey data (Appendix H10) were statistically significant ($F(30, 345798.10) = 64.752, p < .05$), thereby violating the equality of covariance matrices assumption for the five dependent factors for the MANCOVA statistics. Thus, the error variances recorded by the groupings in this study statistically varied amongst the low, moderate, and high entrepreneurship students from the three public universities regarding how they exercise their cognitive traits.

Because of Box's test violation of the multivariate equality of error scores in the outcome factor test in Appendix H 11, Leven's test for equality of error variances was also computed in this study based on univariate assumptions instead. Results showed that except SGGS ($F(2, 703) = .327, p < .05$) and ELCM ($F(2, 703) = .353, p < .05$), three dependent factors passed the equality of error variances test. Specifically, the GTSE ($F(2, 703) = .95, p > .05$); nAch ($F(2, 703) = 2.18, p > .05$); and RTBS ($F(2, 703) = .255, p > .05$) met the equality of error variance condition in the current study.

How do statisticians handle equality of variance violations? Deletion of cases to equal sample size in case of homogeneity of covariance matrices violations is one such approach to resolving violations of variance-covariance matrices assumption (Field, 2009; Tabachnick & Fidell, 2013). According to Tabachnick et al., the consequences for violating the homogeneity of covariance have been accounted for by

Hotelling's T^2 statistical model that considers the equality of sample sizes in IBM SPSS Statistics Version 23. However, the unequal sample sizes (Figure 5) reported in the survey data have created a corpus searching for different multivariate variance-covariance error matrix measures. It is also instructive to note that the error bars shown for the three levels in Figure 5 visually varied on their medians and interquartile ranges. The *Moderate Group* recorded over 350 students from the three universities in the top 50th quartile (median). Tabachnick & Fidell's prescription that Hotelling's' T^2 and Pillai' Trace tests are robust enough to account for covariance matrix violations is not tenable in this study.

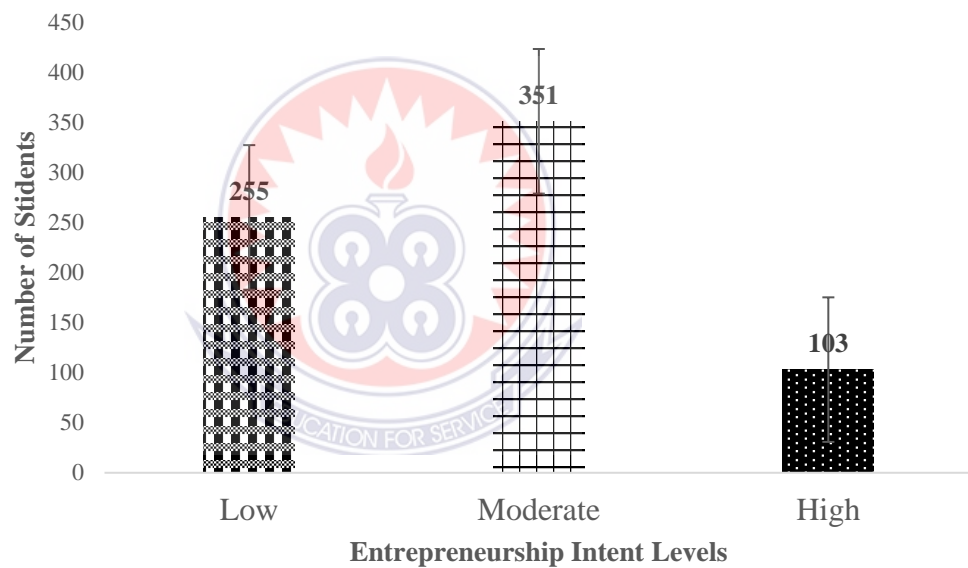


Figure 7: Students' levels of entrepreneurship intent (n = 709)

It is insightful to report that all four test statistics (Pillai's trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root) in MANCOVA possess relative power and robustness inherent in multivariate normality test to account for violations of equal sample size and equality of variance test (Tabachnick & Fidell, 2013). Consequently, the study critically examines Roy's Root test, which is susceptible to equality of

covariance matrix and platykurtic distribution violations that also proved significant in the Hypothesis 1 result (Section 4.1.1).

3.9.1.4 Post-Hoc Criteria for Hypotheses Testing

Logic rather than methodological views dominated the contestations for multivariate statistical follow-ups. Whilst some think conducting univariate statistics such as ANOVAs as follow-ups to multivariate group differences is ideal (Bock, 1975), others simply believe the purpose of the multivariate follow-up test is a defeatist one with little progress (Field, 2009). Some have proposed discriminant function analysis as an ideal alternative to MANOVA or MANCOVA, the univariate procedures (Hair Jr. et al., 2014). However, some statisticians still recommend both discriminant function analysis and univariate techniques with the notion that the combined procedures enable researchers to appreciate the patterns in their data. The combined recommendation provided the impetus for a series of post-hoc and contrast analyses following hypothesis testing in this study.

Discriminant function analysis (DFA) procedures work like logistic regression, but with more than two grouping variables, it becomes complex for logistic regression to account for differences. Therefore, DFA attempts to predict the membership of experimental groups (outcome) with several predictors in an experimental design (Field, 2009). However, the discussions on discriminant analysis seem to ignore discriminating experimental groupings (predictors like MANCOVA) with covariates. Unlike MANOVA, which uses DFA, even the most enthusiasts of multivariate statistical models, such as Andy Field (2009) and Joseph Hair Jr. et al. (2014), seem to be silent on how to perform post-hoc tests on MANCOVA using DFA. Therefore, this study lays no claim to such an attempt of using DFA to examine the group mean

differences between the SEPM Levels (predictors) and cognitive factors (Dependent) following the significant MANCOVA. Instead, the traditional univariate statistical approaches like chi-square, t-test, ANOVA, and multiple regression (e.g. Tables 15 to 18) are reported for supplementary hypotheses.

The univariate techniques employed in the current dissertation are premised on the reasoning that *F*-statistics in several models (including MANOVA and MANCOVA) only test the overall statistically significant differences between means for experimental variables without indicating which effects might be accounting for the global variance detected (Jackson, 2009, p. 272). Hence, researchers recommended following through with such tests with planned or post-hoc contrasts to detect the contributing effects of the experimental manipulations (Tabachnick & Fidell, 2013). Post-hoc tests are *pairwise* comparisons of experimental groups (SEPM Levels) without a prior hypothesis during data collection (Heiman, 2011, p. 307). In this study, a non-orthogonal contrast (post-hoc) of simple contrast that compares each experimental category to the first category ('low') was used to test statistical differences between the last ('high') categories of SEPM Level as the experimental effects. The last category coded for the experimental effect comprised scores of 5 and 6 on the SEPM scale in Appendix C, representing the expected desired entrepreneurship activity of the respondents in *ROI* results.

Two post-hoc techniques guided the study. *Familywise error* rate (inflated alpha due to multiple univariate statistics on the same data) was considered in this study by adopting the Bonferroni correction technique of post-hoc test and the Tukey's test with Games-Howell procedure to account for unequal sample sizes for the three SEPM levels (*Never* (1) = 255; *Sometimes* (2) = 351; and *often* (3) = 103) in this study. The choice of post-hoc for the test in MANCOVA was due to the assumption that literature

and theory seem not to have produced significant results on how cognitive constructs accounted for entrepreneurship propensity levels in the Ghanaian context. Consequently, the decision to run simple contrast only after significant omnibus (e.g. Pillai's Trace) statistics for the stated hypotheses in this study.

3.8.2 Multiple Discriminant Analysis for Hypotheses 2 and 3

This segment describes the statistical models fitted to the categorical variables predicting business students' entrepreneurship propensity in *ROI* (Figure 1). Selecting covariates (independent variables in discriminant analysis depends on two things: utilising the researcher's knowledge (intuition) or based on a theoretical model underpinning the research question (Hair Jr. et al., 2014). The 17 categorical variables generated in Part D1 of the questionnaire (Appendix C) were of interest to the study based on the entrepreneurship literature (Weiner, Geldhof, & Lerner, 2014) and their roles in the Ghanaian context. However, only six categorical variables (gender¹, birth order², authoritative parenting style³, entrepreneurship seminar attended⁴, leadership⁵, club membership⁶) are significant predictors for hypothesis testing in Section 3.11.

Multiple discriminant analysis techniques address research problems seeking to predict membership of groupings with dichotomous outcome variables with multiple (two or more) discriminant covariate metric or non-metric predictors (Field, 2009; & Hair Jr. et al., 2014, p. 231). Hair Jr. et al. further classifies discriminant analysis as two-group and multiple discriminant analysis (MDA) involving three or more predictors in linear combination with variate weights (β) and group means called centroids. Examples of multiple discriminant function analysis chosen were hierarchical loglinear analysis (H_02) and stepwise logistic regression (H_03), which are described further to predict group membership in this study.

Like GLMs, discriminant analysis strives for a series of assumptions for

statistical power and detecting large effect sizes. Field (2009: 273) summarises these assumptions into three – linearity, independence of errors, and multicollinearity checks. Similarly, Hair Jr. et al. (2014: 248) recommend avoiding small sample sizes likely to produce sampling error and strive for average sample sizes with 20 for each predictor and outcome variable or a minimum of five cases per covariate. With the use of Box's M test as a sensitive measure of the significance of covariates, variables that do not differ across groups have little predictive outcomes in discriminant analysis and must be eliminated from the model. Whilst chi-square tests are often used in model estimation in MDA, cell counts of 5 or 20% (Shaughnessy, Zechmeister, & Zechmeister, 2012) are closely related to Hair Jr. et al.'s sample size recommendations.

The assumptions of multivariate normality, dispersion, and covariance structure for the outcome groups and covariates have generated mixed prescriptions from statisticians with Hair Jr. et al. (2014) whimsical about sensitivity tests for MDA as not proven, so researchers should be cautious of its impact on models' interpretation or consider alternative discriminant tools that account for the problem. Similarly, Field (2009) pointed out that the issue of linearity is not tenable in the discriminant analysis since categorical variables cannot be modelled on a straight line. Hence, the log (*logit*) of the data is considered to be in line with Hosmer and Lameshow's (1999) estimation criteria. On the issues of linearity and covariance considerations, Hair Jr. et al. proposed binomial distribution instead of the normality tests that characterised GLMs and remember that the variance of non-metric variables is not constant, thereby causing heteroscedasticity problems with data transformation of predictors and outcome variables not a remedy in MDA. However, discriminant models are assumed to be robust enough to handle assumption violations in data.

Indeed, independence of scores must be ensured, with each participant

providing a single response to an item. The issue of multicollinearity and sphericity is not an issue for MDA due to the non-metric nature of the predictors often involved. However, the primary outcome variable (SEPM) in this study received extensive exploration with factor analysis (EFA) at the stages of questionnaire piloting (Section 3.4) and parametric assumption testing (Section 3.9). The following section outlines the loglinear analysis for H_{o2} and H_{o3} and logistic regression for H_{o4} .

Hierarchical Loglinear Analysis

The model fitted to H_{o2} and H_{o3} is within the larger family of discriminant analysis that seeks to predict a group's membership from a series of covariates. Specifically, loglinear analysis is akin to chi-square. Still, it has the advantage of coalescing metric and non-metric covariates as predictors by structuring a linear relationship that collectively and individually accounts for the dependent variable (Field, 2009). Loglinear analysis uses a saturated model to approximate the beta weights with interaction effects that best explain the observed and expected frequencies in the data (e.g. chi-square test).

Assumptions of loglinear analysis align with Pearson's chi-square with issues of independence of raw scores, sample size, and cell counts large enough for reliable expected estimation in a contingency table. Hair, Jr. et al. (2014) suggested that an average of 20% and minimum frequencies of 5 per cell are also tenable for the loglinear model. More conservatively, Field (2009: 710) considers that at least all observed scores must be larger than 1 in the contingency table for a meaningful fit-of-model. A drastic reduction in test power is the apparent penalty for violating loglinear analysis assumptions. Field prescribed steps to minimise loss of such test power as (a) accepting the loss test power, (b) transforming the predictors by recoding to reduce scale levels across, or (c) researcher gathering more data to mitigate power loss. Considering that

data transformation has its own theoretical and practical considerations among statisticians (Johnson & Wichern, 2014, p. 192), accepting the loss of power in the preliminary study of this kind in the Ghanaian context might be a preferred option for exploration sake than any other consideration in this study.

However, the sample size is not an issue in the survey data for this study since assumptions checked for the H_{o2} and H_{o3} based on sample size and cell counts did not pose a concern since the residuals for all cell counts for institutional and personal factors, respectively were statistically significant ($p < .05$). The significant results meant that the expected frequencies generated by the loglinear model compared with the observed frequencies from the sample data did not differ significantly, hence confidence in the survey data to meet the models' parameters in this study. Consequently, the test statistics estimating the overall model-fit was chosen based on the sample size estimation criterion of Pearson's χ^2 and the Likelihood ratio tests. Whilst the likelihood ratio test adapts to small sample sizes, Pearson's test applies to large samples (Field, 2009).

Therefore, this study used a 709 sample size from which loglinear analysis generated model combinations for the three personal traits (gender, parenting style, & birth order) and the four institutional conditions (entrepreneurship seminar attended, leadership opportunity, and club membership) for Hypotheses 2 and 3, respectively. For example, in generating the interaction effects, 220 samples were used for H_{o2} (Appendix I (3)), whilst 181 cases met the estimation criteria for H_{o3} . The meaning of the reduced sample sizes for H_{o3} and H_{o2} is explained by the *probit* estimation needed for cases within each cell of the classification tables (Tables 15 and 22). For instance, not every student who was a first-born child was likely to be a female, experience authoritative parentage, and at the same time belong to category three of the SEPM

factor in this study. Hence, reduced samples for the final loglinear analysis are witnessed. This aptly justifies the loglinear analysis for the probability estimation approach in building its model-fit (Field, 2009).

Nevertheless, this study considered the sample size most suitable with significant residual values reported as large enough to warrant the Pearson's chi-square tests as the final model estimation in H_{o3} and H_{o2} . It is also important to note that a reduced sample size of 220 and 181 for H_{o2} and H_{o3} predictions manifests the difficulty of detecting interaction effects to explain human behavioural traits to account for entrepreneurship intent. Such might be the case for students developing requisite behavioural traits in entrepreneurship propensity with their personality and institutional conditions available to them.

However, one challenge with general linear statistical models (GLM), including discriminant analysis, is *over-fitting*, where researchers just sling multiple variables into a model, leaving out relevant independent constructs likely to explain the outcome variable (Field, 2009). Consequently, this study avoided over-fitting by re-categorising the demographic variables into two based on theory and literature (Weiner, Geldhof, & Lerner, 2014; Damon & Lerner, 2008). Thus, Research Hypotheses 2 and 3 sought to examine how demographic factors such as personal traits (gender, birth order, and parenting style) and institutional conditions (entrepreneurship seminar attendance, leadership role, and club membership activities) respectively influence business students' entrepreneurship groupings using hierarchical loglinear analysis with a saturated model. The saturated model estimates whether the model fits the observed frequencies in the survey data using the goodness-of-fit tests (*Appendices I (4) and I (2) for H_{o2} and H_{o3} , respectively*). In both cases of the saturated model, the loglinear statistics perfectly predicted the survey data that predicted the two hypotheses.

In addition to the saturated model employed in modelling, H_{o2} and H_{o3} were the stepwise techniques used to test the interaction effects of the predictor variables in the model; hence, the label was hierarchical loglinear regression. Using likelihood ratio and Pearson's χ^2 tests, loglinear analysis combinations the covariates to estimate which combinations best account for a large percentage of variance SS_T , SS_M , and SS_R in the outcome factor (Johnson & Wichern, 2014; Tabachnick & Fidell, 2013). Tables 19 (H_{o2}) and 21 (H_{o3}) show such interaction estimation for the loglinear model for the survey data.

Finally, this segment describes the management of covariates and outcome factors to test H_{o2} and H_{o3} . Discriminant modelling should minimise the number of levels (values describing a factor) to two or more but not exceeding four or five if the factor in question was measured on a metric scale (Hair Jr. et al., 2014: 346). The lengthier the levels of factors means a large contingency table construction and laborious inspection of the model's interaction effects; a case in this study where originally personality constructs such as parenting style (level 1-5) and birth order (1-17) with institutional factors of seminars attended recording levels 1 to 21 were observed in the survey data points. Such fragmented levels made detecting the main effects complex for the loglinear model. The *Compute Menu* and *Recode into Different Variables* in IBM SPSS Statistics Version 23 were tools used to reduce variable levels for loglinear analysis in H_{o2} and H_{o3} . For instance, the authoritative parenting style initially measured on a 5-point Likert type scale (Appendix C) was reduced to two levels: 'Yes' ('Agree' and 'Strongly Disagree') and 'No' ('Disagree' and 'Strongly Disagree') with values of 0 (*No*) and 1 (*Yes*) assigned.

Similarly, the second personal trait of birth order recorded figures between 1 and 17 (Appendix J (4)). The 17 levels were collapsed into three (first born = 1; middle

born = 2 to 17; and Last born = 99). The entrepreneurship seminar attended generated attendance by students ranging from 1 to 21 (Appendix J (5)). The 21 levels were also categorised into three. The first category of '1-3 times attendees' were 44.43% (n = 315); 25.53% (n = 181) formed the '4 to 6 times attendees' group, with 7.19% (n = 51) constituted the '7 times and above attendees' and 22.8% (n = 162) missing cases recorded (see Appendix J (6)).

Academic programmes (department) and leadership factors were measured as non-metric data where respondents ticked boxes applied to them. However, for relationship testing, arbitrary levels were assigned. Leadership recorded six levels as none = 1, course prefect = 2, hall executive = 3, SRC executive = 4, church leader = 5, and other = 6. However, levels 1 and 6 were omitted in the analysis for their non-significance to the analysis. Similarly, the academic programme was coded on six scales (levels): 1 = accounting, 2 = human resource Management, 3 = marketing, 4 = health administration, and 6 = Management. Finally, the six levels were used to operationalise the club activity factor as 1 = sports, 2 = club membership, 3 = radio journalism, 4 = print journalism, 5 = other, and 6 = none for H_{o2} and H_{o3} testing using hierarchical loglinear analysis.

3.8.3 Logistic Regression Test for Hypothesis 4

Binary logistic regression was considered the most suitable model to explain predictor factors' collective and individual contributions in the survey data for Hypothesis 4 (H_{o4}) analysis under the MDA umbrella (see Section 3.9.2). According to Hair Jr et al. (2014), logistic regression derives its name from the logit transformation applied to the dependent variable using the S-shaped curve to predict data points fitted to the statistical model, making it such a unique technique for analysing dichotomous (0 and 1) outcome variables with series of metric predictors. Thus, logistics regression

has the advantage of incorporating metric and non-metric predictors. Hair Jr. et al. further points out that logistic regression is robust and immune to multivariate normality and equality of variance across groups (outcome factor) violations and enables estimations of goodness-of-fit for the overall model. Assumptions of sample size, independent of scores, are equally important but not necessary for logistic regression because of their robust mechanisms for ignoring the distribution of scores and heteroscedasticity assumptions peculiar to GLMs (Field, 2009).

How were the assumptions met for H_04 ? The survey data generated from the field enforced the requirement that students answered only one questionnaire and were not to confer responses. Secondly, the minimum sample size of 5 and average of 20 per covariate recommended by Hair Jr. et al. (2014) was examined in Table 22 with a minimum of 13 and maximum of 413 cell counts for the gender as the outcome variable in H_04 . The cross-validation of the logistic regression model, Appendix J (3), showed 709-sample inclusion in the analysis. Also, the three metric predictors in H_04 were rigorously subjected to Bartlett's test for sphericity in EFA (Table 4) and multicollinearity (Table 10) and normality (Table 11) where *Factor 4* (SGGS) met the Kolmogorov-Smirnov ($K-S(173) = .056, p > .05$) and Shapiro Wilk's ($W(173) = .992, p > .05$) criterion of validity. However, the K-S test for normality for *Factor 2* (STA) and *Factor 3* (GTSE) failed the normality tests in this study (Appendix J (2)).

However, drawing on the robustness of the logistic regression models, such violations were not considered challenges for H_04 . The choice of binary logistic regression for testing H_04 was premised on an attempt to avoid familywise error likely to reduce the power of detecting genuine effects in selected models like t-test, which Hair Jr. et al. (2014) called *experimentwise error rates* (a combined or overall error rate emanating from performing many t-tests among pairs of categories for significant

difference). In this study, error rates likely to inflate the error margins could be introduced between *Factor 2* (STA), *Factor 3* (GTSE), and *Factor 4* (SGGS) and gender. Besides, achieving theoretical parsimony explaining the H_04 would have been difficult when the study dealt with multiple tests involving three factors. Combining the predictors reduces the familywise errors, which would have been 25% (3 factors contributing $\alpha .05$) and increased confidence in the model for detecting effect and avoiding Type 1 error in the survey data for the study (Field, 2009). Therefore, three metric predictors (Factors 2, 3, & 4) were matched with gender as the categorical outcome in H_04 and the results are presented in Section 4.1.4.

Indeed, the covariates in H_04 have been extensively described in Sections 3.4 and 3.9 in this study as metric variables that met the requirement for logistic regression analysis as covariates in predicting a dichotomous outcome variable except the *Factor 2* (STA), which had its normality statistics shown in Appendix J (2). *Factor 2* was measured initially on six categorical scales with 1 = 'Awareness', 2 = ' Learning process', 3 = '*Understanding and application of the process*', 4 = '*Familiarity and confidence*', 5 = '*Adoption to other contexts*', and 6 = '*Creative application to new contexts.*' In survey and correlational studies, categorical items can be converted into ranked order or continuous scale based on the magnitude and relative standing of the variables (Gall, Gall, & Borg, 2010) from one level to another (Johnson & Christensen, 2008; Babbie, 2010).

Subsequently, *Factor 2* was used as a covariate to account for its individual and collective contribution to gender dynamics in this study. Appendix J (7) shows that the majority of the final year business students who responded to *Factor 2* indicated level 5 as their technology adoption stage, with 68.8% (n = 166) and only 3% (n = 20) reporting their 'Awareness' of ICT tools. Based on technology literature that predicts

gender disparities in technology adoptions and competencies (Yidana, 2007), Factor 2 was used to predict which gender grouping might explain business students' technology adoption levels in this study. Besides, entrepreneurship activities have been linked to technology innovations as influential predictors (Drucker, 1985). Therefore, exploring Factor 2 as a variate in logistic regression was considered appropriate in contributing to entrepreneurship literature in the Ghanaian context.

3.8.4 One-Sample t-Test

Finally, the study sought to ascertain whether students' scores on stages of technology adoption could be generalised to the population using a one-sample t-test following an emergent finding from H_04 . Huck (2012: 205) detests many researchers from limiting the interpretations of their statistical findings to only the sample data and reminds them that the power of inferential statistics is also derived from extension to the population parameters. Considering Huck's suggestions, the current study explicitly sought to test the statistically significant difference between the sample data 709 and the unknown population mean and *SD* for technology curriculum policy and guidance and counselling practice implications.

From the literature, technology learners come through with several learning levels, which need to be explored for curriculum and training design purposes. Based on the principles of null hypothesis testing, a one-sample t-test uses the sample's standard deviation (*SD*) to estimate the population *SD* (Howell, 2010). Some describe the one-sample t-test as an elegant statistic that enables us to extrapolate sample distribution into unknown population parameters (Field, 2009; Howitt & Cramer, 2011). Consequently, the study used the one-sample t-test to estimate the population parameters of business students from Ghanaian public universities.

3.9.0 Administration of the Research Instruments

Questionnaires contain self-report data collection instruments for each participant to fill independently in a study. Interviews also serve as a data collection tool, which allows an interviewer (the researcher or his trained representative) to pose a series of questions related to the research objective to an interviewee (also called the participant) for their response in a research context (Johnson & Christensen, 2008). However, Gold (1984) draws researchers' attention to the social desirability effects inherent in questionnaires where respondents tend to create favourable ideological pictures of themselves when answering objective test items. Validation techniques such as the split-half tests are some of the recommendations to address such flaws in questionnaire administration (Hansemark, 1997).

Finding connections between entrepreneurial activity and personal characteristics led to development of two significant paradigms in measuring cognitive behaviour. These are the impressionistic school and the projective tests (Hansemark, 1997, p. 280). Caird (1963) further illustrates that the psychometric school uses objective tests such as questionnaires. Again, Hansemark describes the projective test as an investigation of individuals who interpret their expressions of standardised, unstructured material by the experimenter. Hansemark also points out that the Thematic Apperception Test (TAT) with a psychoanalytic theoretical foundation is the pioneer test for measuring entrepreneurship and the need for achievement constructs. However, psychometric tests have seen considerable adaptation in social research due to their low cost (Cohen et al., 2007; Johnson & Christensen, 2008; Babbie, 2010). Therefore, considering the large sample size in this survey, data gathered from the field was guided by a mixed-method research design that combines questionnaires (quantitative) and interviews (qualitative). Similarly, two main research goals - to predict

entrepreneurship propensity and explore students' lived experiences on developing entrepreneurship competency within the Ghanaian Indigenous knowledge system guided the current study.

Several studies with questionnaires to measure entrepreneurial propensity in other jurisdictions exist (Kennedy et al., 2003; Basu & Virick, 2008; Samuel, Ernest & Awuah, 2013; Atef & Al-Balushi, 2014). Therefore, the data gathering strategies inform the 709 questionnaires from final year undergraduate students in three Ghanaian public universities with two focus group discussions (FGDs) comprising 11 purposefully selected final year business students from the Department of Business Education in a Ghanaian teacher university. The procedures for administering the two instruments are described in this section.

Questionnaire administration in this study involved contact persons such as Heads of Departments, Lecturers, Graduate Assistants, and Course Representatives. For instance, at the University of Education, Winneba, lecturers and course representatives helped administer the questionnaires before and after lectures. Thus, the questionnaires were filled in a classroom to enforce ecological validity in the data collection process. Using contact persons to administer the questionnaires to respondents probably contributed to achieving the over 71.64 (n = 236) percentage average return rate for the three universities (Appendix D6). The low (48%) return rate from UCC can be explained in that it was the last day of their final paper; hence, some of the targeted students were reluctant to respond to the questionnaires. A respondent wrote on a questionnaire asking whether his GPA would be increased by answering the questionnaire. However, data was gathered from the University of Education, Winneba, through the help of two Lecturers and two Course Representatives, whilst two Heads of Departments and two Graduate Assistants supported the administration of the

questionnaires at the University of Ghana, Legon.

The interview sessions were organised within the participatory rural appraisal (PRA) framework of qualitative data collection and analysis that employs focus group discussion (FGD) involving homogeneous groups. The PRA approach is described as a family of techniques and methods to enable rural people to share, enhance, and evaluate their behaviour knowledge of life and conditions and provide action plans guiding them (Chambers, 1994, p. 953). Historically, RPA methods have evolved since the 1980s, serving traditions such as anthropology, participatory research, agroecosystem, and social intervention programmes. The concept of 'rural' sometimes denotes unity, concern for one another, friendship, problem-sharing, and a sense of community. Therefore, Chambers proposes that PRA allows outsiders (researchers) to elicit and extract various issues, including change analysis, mapping, modelling, and grouping – knowledge owned by the local people- as gaining grounds.

However, the PRA methods can be seen with FGD approaches to data collection in research methods literature (Gall, Gall, & Borg, 2010; Babbie, 2010; Creswell, 2012). Gall, Gall, and Borg defined focus groups as small groups (e.g. students, teachers, club members) interviews of participants guided by a trained interviewer or a researcher (2010, p. 349). Johnson and Christensen state that the term 'focus' originated from the practice of the moderator to assist discussants in exhausting a particular subject or theme (in-depth). Consensus building to validate common knowledge might not be of the essence in FGD. Still, researchers hail its explorative function that supports members' views and tapes emergent themes (Given, 2008, p. 352) with its potential to triangulate data from questionnaires, tests, and observations (Cohen et al., 2007). Compared with the RPA method, FGDs also employ principles and practices such as community sharing, local information ownership, and consensus building.

Consequently, this study adopted the PRA methods (approaches) complimented by FGDs to elicit qualitative data from the participants by interviewing two homogeneous groups (HRM and accounting) separately. As members of a ‘community’, the participants shared and collaborated with each other’s views on the four themes (*see* Appendix D2) explored in the discussion sessions of the interview protocol.

Choosing discussants for an FGD is a subjective matter for qualitative researchers, as Johnson and Christensen (2008, p. 210) suggested between 6 and 12 decisively chosen discussants in a ‘group’ with homogeneous traits to promote discussion depending on the purpose of the research. Despite Cohen et al. (2007, p. 377) also proposing between 4 and 12 group membership, they advised that small or large group, intra and extra group membership dynamics should inform group size decisions. This is a matter of heuristics for researchers depending on the research objective, group interest, cohesion, and ability to manage the discussion process with available resources. In the current study, such heuristic judgements guided the group membership. A day before the interview, consent forms were sent to the group leaders (class representatives) to inform colleagues to participate at the time and venue specified. Eight human resource management (HRM) students and three from the accounting programme volunteered to participate in the interview sessions. However, the two groups were interviewed separately based on the interview protocol in this study. The HRM group interview produced 1 hour and 4 minutes, and the accounting group produced 1 hour 17 minutes of transcribed data (Appendix D3)

According to Johnson and Christensen (2008), the interview protocol is a scripted question guide for the interviewer when eliciting participant information. However, the interviewer must be broad-minded in exploring issues using standard interview probes (i.e. *repeat question, anything else? Another, other? How do you*

mean? And tell more) beyond the scripted questions. Johnson and Christensen proposed an interview guide approach for standardisation by posing the same questions to different groups of interviewees. Hence, this study used the same interview protocol for the two groups of discussants. In the current study, leading questions were posed to the entire group with volunteers or interested discussants, often answering with other members subsequently joining. A standard probing question format was adopted to clarify discussants' submissions and explore issues in-depth (*see* Appendix D5 for sampled voice interview transcripts with probing questions). I also probed to interpret submissions within the interpretivists' practices of qualitative data generation (Stake, 2010; Yin, 2011) by using the curling brackets ([...]).

The four themes written on paper (Appendix D1) were folded for students to pick randomly during discussion sessions. The PRA approaches to knowledge gathering also informed the adoption of a circular sitting position in this study. The discussants sat around a table face-to-face to observe the non-verbal communication cues of colleagues (Appendix D4). The seating arrangement also allowed each discussant to interact, share, and analyse common problems confronting them as business education students. A digital voice recorder and recorder software on an iPad came in handy during data capturing. The iPad was the backup device for digital voice recording. Soft drinks were provided to the participants after the interview sessions.

3.10.0: Parametric Assumption for Univariate Tests

Field (2009: 88) quotes Rosenthal as saying researchers should “make friends with their data.” In Rosenthal’s view, researchers need to understand the nuances of the collected evidence to test hypotheses. Even though the overarching desire of this research is to predict business students’ entrepreneurial intentions, multivariate statistical models, descriptive statistics, and univariate tools were employed to discover

a series of patterns in the quantitative data (questionnaire) collected. Descriptive statistics were used as data exploration tools in the current work. The measures of dispersion, frequencies, and graphs also enable statisticians to detect measurement errors in data collection (Howitt & Cramer, 2011). For instance, outliers are influential data points that can affect inferential statistics in hypothesis testing (Field, 2009; Weiss, 2012).

The influence of visual culture on knowledge generation in the 21st century cannot be underestimated, considering the increasing attempt to engage multiple senses in information processing and communication (Mitchell, 2002). Therefore, graphics for interpreting behavioural data in this study were positioned within the theoretical view of 'visual culture' and practices. Indeed, visuals are a quick and convenient way to communicate with more stakeholders in the academy (Mirzoeff, 2006) and seem to provide cognitive support to human learning (Shelly et al., 2006; Lohr, 2008). However, the strength of visuals is limited to what meets the eyes and does not explain variations in data points. Accordingly, statisticians often attempt to achieve the highest level of objectivity by employing mathematical approaches to data reporting and interpretation in research studies.

Most importantly, inferential statistical tools require assumption testing to enable researchers to collect data from a particular sample and use statistical models computed to conclude a population from which samples are taken (Black, 2010). In addition, inferential statistics often requires that the data meet specific basic requirements before deciding the type of statistical model (Field, 2009). Field states that most parametric tests are based on normal distribution, linearity, equality of variance, metric data, and independent of scores assumptions. Most importantly, Hair Jr. et al. (2014) bemoaned that multivariate statistics burdens the researcher to

understand, evaluate, and interpret complicated results by thoroughly appreciating the fundamental patterns underlying the data and existing relationships. Hair Jr. et al. further draw comparisons between univariate and multivariate statistical models and enjoy the unique data characteristics becoming more complicated with multivariate than univariate statistics. In addition to multivariate assumption testing for MANCOVA and MDA, this segment subjects the survey data to assumptions testing with graphics and mathematical techniques to determine the requisite statistical models for testing the research hypotheses in this dissertation. With multiple variates tested in this study for fulfilling analytical gaps and recommendation that multivariate techniques should be employed to account for significant variations of traits defining the entrepreneurship construct (Jain, 2011), this study raises four null hypotheses based on ROI to predict business students' entrepreneurship propensity (Section 3.11).

Violation of statistical assumptions can affect the predictive power of our outcome variables. For instance, on detecting power and fitting parametric statistical models to sample data, statisticians have strongly advocated that researchers understand the patterns in their data by testing required conditions; otherwise, non-parametric versions of such models should be preferred (Field, 2009; Jackson, 2009; Hair Jr. et al., 2014; Howell, 2010). This study tested multicollinearity, sphericity, outliers, missing data management, simple scattered plots, box plots, P-P plots, Pearson's r , Kolmogorov-Smirnov, and Shapiro-Wilk as data diagnostic strategies for parametric statistics use as well. The measured CSTI, GTSE, SGGS, ELCM, nAch, RTBS, and SEPM factors were subjected to normality, contiguity, and equality of variance tests. On the other hand, the metric scale and the independence of scores as necessary conditions for univariate parametric tools were explored with personal judgment in the study.

3.10.1 Missing Data Management

Data analysts are concerned about missing data, which Tabachnick and Fidell (2013: 62) described as “the most pervasive problem in data analysis.” What is missing data, and how are they handled in hypothesis testing? This segment outlines the procedures used to account for the unavailability of data points in testing the hypotheses in this study.

Others stated that missing data resulting from the demise of a subject, equipment dysfunction, and recalcitrant respondents pose a challenge to the data (Field, 2009; Tabachnick & Fidell, 2013). The psychological research views offered by Johnson and Wichern (2014) also believe that respondents’ unwillingness to answer a survey item could cause missing observations. Afifi, May, and Clark (2012) have categorised missing data as *unit* and *item* nonresponsive. The unit nonresponsive situation applies where a researcher obtained no data from a respondent, a case, an individual, or a sampling frame, whilst the second classification, called *item* nonresponsive, pertains to cases, individuals, and respondents’ refusal to answer questions on an instrument thoroughly. In survey research, both categories of missing data could apply where a researcher has little or no control over the respondents due to observing ethical principles such as participants’ consent, right to withdraw, or non-disclosure privileges. Consequently, statisticians suggest that the pattern of missing data should be considered with the view that missing values at random pose no danger for data analysis. According to Tabachnick and Fidell, non-randomised missing data are likely to affect the generalizability of results.

Johnson and Wichern (2014) lament that, to date, statisticians have not been able to develop techniques for missing data management. However, several methods that are not based on rigorous algebraic equations have been proposed to deal with

missing data in research findings. Characteristically, such proposed methods apply to item nonresponses rather than unit nonresponsive missing data. For example, the imputation method of managing missing data involves discretionary values such as the weighted average (group mean) and median, estimated to replace the missing data points (Pallant, 2005; Field, 2009). Others also recommend that when performing multivariate analysis, if a very high number of items are missing on a variable or a crucial variable is missing. The data point or the case should be deleted before subsequent analysis (Afifi et al., 2012). In another breadth, Afifi et al. also recommended heuristics and personal judgements by determining the importance attached to the variable in question; if no special interest is connected to the variable, it can be ignored. Tabachnick and Fidell (2013) also noted that the deletion method is the most widely used technique for handling missing data in software packages such as the IBM SPSS Statistics Version 23 and the SAS. In addition, Afifi *et al.* advise researchers to focus on missing data since that could also lead to emergent findings. The current study used the deletion technique based on the recommendations on randomised missing data (Johnson et al., 2014; Field, 2009; Tabachnick et al., 2013) by choosing *listwise cases* during the data exploration with IBM SPSS Statistics Version 23. Only 4.1% (n = 29) of data were reported by the computation on the primary outcome variable (SEPM) as missing data out of 709 samples (Appendix J5).

3.10.2 Outliers Management in the Survey Data

Influential or different values outside the scales that measure constructs can influence the distribution or spread of scores in central tendency measures such as mean, median, range, and standard deviation (Tabachnick & Fidell, 2013; Hair Jr. et al., 2014). Typically, the mean suffers most from inflated standard deviation (*SD*) and should be checked during data management (Field, 2009, p. 97). The mean is the central

theme for many parametric statistical tools such as t-tests, ANOVA, and regression (Heiman, 2011). Inflated means will likely produce significant results that might not reflect the attribute in the population under study. Therefore, researchers are strongly advised to subject their datasets to outlier checks with different approaches, including frequencies and diagrams. Graphical approaches such as box plots and box whiskers for checking influential scores in data have been recommended aside from using frequency tools (Hair Jr., Black, Babin, & Anderson, 2014). The median at the centre of the box-whisker graph displays the locations of the middle and 50% raw scores in the interquartile range (Field, 2009). IBM SPSS Statistics Version 23 can identify those cases affected by the outliers. In this study, those cases produced outliers by editing from the datasheet view. Figures 7 and 8 are examples of questionnaire items and cases that produced outliers likely to affect the mean scores in the current study. Figure 6 shows that the CSTI Factor check with gender recorded few outliers with questionnaire numbered 7 (CSTI15) had a score of 55 entered instead of 5 into the cells due to mistyping, hence, most likely to bias the CSTI Factor's mean and subsequent analysis in this dissertation.

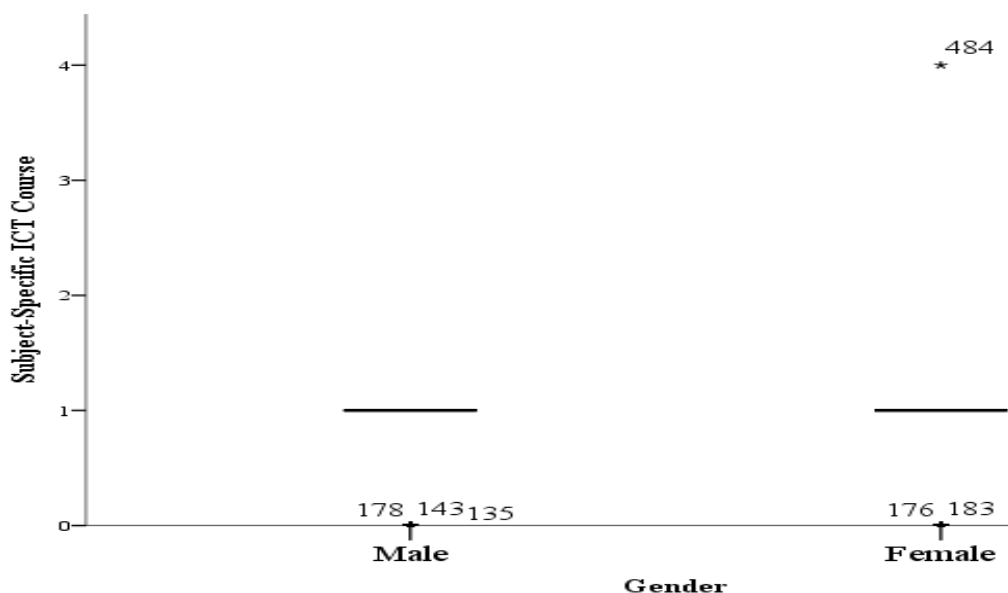


Figure 8: Outliers check for CSTI Factor and gender

Source: Survey data, 2016

Similarly, box plots were not generated for UEW, UCC, and UG in Figure 6 due to the presence of outliers (e.g. 15, 32, 40, 267, 269, 275, and 289) in the questionnaire items from UEW (#40, # 15, #7, and # 32) and UG (#269, #275, #267, and #289) on CSTI 9 (Appendix C) alone. Indeed, Figure 7 also shows box whiskers for the median scores and scores within the scale on a CSTI Factor as outliers check in this study.

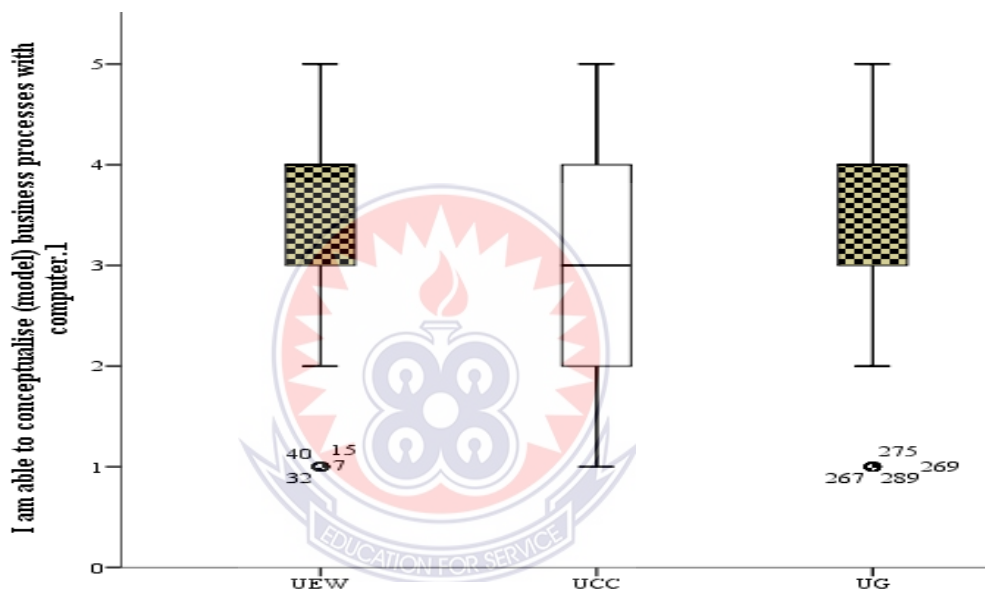


Figure 9: Checking outliers with box-whiskers with campus

Source: Survey data, 2016

This study also used frequency (minimum and maximum) and box-whisker diagrams to address the possibility of inflated means and *SD* scores in the pilot and final survey data for different statistical results. Exploratory factor analysis (Section 3.4) for the pilot study and the EFA results for the final survey instrument benefited from outliers checked in this study. Hence, this study has confidence in the outcomes of Hypotheses 1 to 4 in the analysis chapter.

3.10.3 Linearity Test for the Quantitative Variables

Research Objective 1 (RO1) sought to predict factors accounting for entrepreneurship propensity amongst business graduates from Ghanaian public universities in this study. Therefore, the survey research approach was adopted under the parallel sequential mixed method banner (see Section 3.1) to answer RO1. One of the requirements for experimental research design is relationship testing to establish cause and effect from the experimental variable(s) in a study (Johnson et al., 2008; Babbie, 2010). Hume (1948) states that cause and effect must occur contiguously. Therefore, examining the relationships between predictor and outcome variables offers researchers a bird's eye view of their data for relationship testing (Tabachnick & Fidell, 2013). Consequently, this section examines the contiguity of the seven identified factors for this study using a scatter plot, normal P-P (probability-probability) plot, and bivariate correlation table.

Using a Simple 3D Scatter Plot for diagrammatic representation, the study viewed how data points from the samples on some factors congregated or dispersed. Figure 8 demonstrates that many students' scores seemed to group around values 3 and 4 for Covariate (CSTI) and the experimental effect (SEPM). Therefore, the graphical representation establishing contiguity amongst factors offers a glimmer of hope that relationships exist between experimental effects and the covariate in this study.

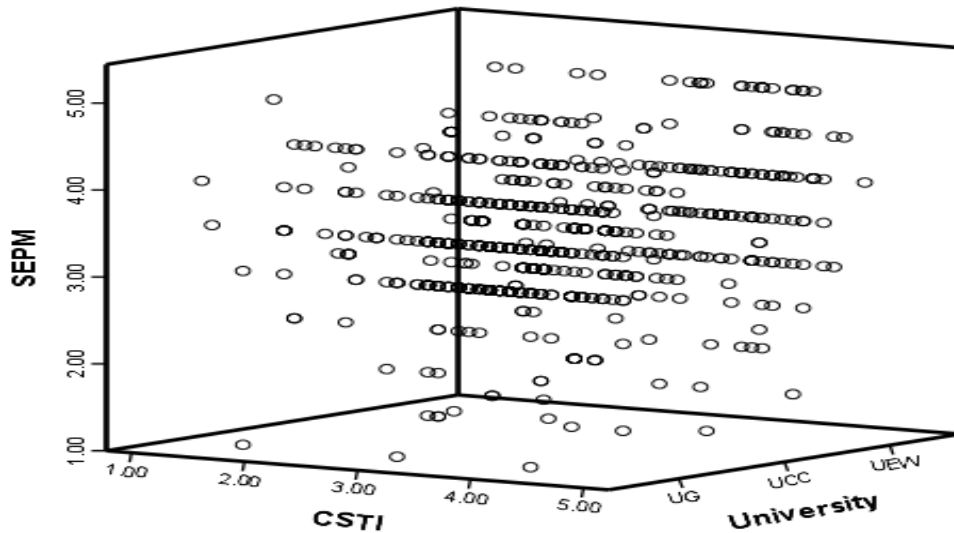


Figure 10: 3D scatter plot for CSTI factor and university

Source: Survey data, 2016

Apart from using a Simple 3-D Scatter plot for graphical projection of contiguity amongst experimental variables, the P-P Chart is another necessary graphical approach to exploring quantitative data. Similarly to the normality test, P-P plots attempt to model the expected and observed data points in a straight line to identify deviations in the observed data point in cumulative probability distribution against the probability of another variable (Dancy & Reidy, 2011). In Figure 9, the diagonal line is the expected data points from the population of business students in Ghanaian public universities on entrepreneurship propensity measure.

The wiggly snake-like strand around the diagonal line in a P-P chart suggests some deviations from normally spread data from the sample scores. Nevertheless, due to the large number of items measuring the SEPM factor in this study, IBM SPSS Statistics Version 23 could not present details, including the predicted scores. Instead, only deviated data points are represented along the diagonal line (Field, 2009). The diagonal line represents the dots around the sample deviation from the expected population scores on entrepreneurship propensity in this research.

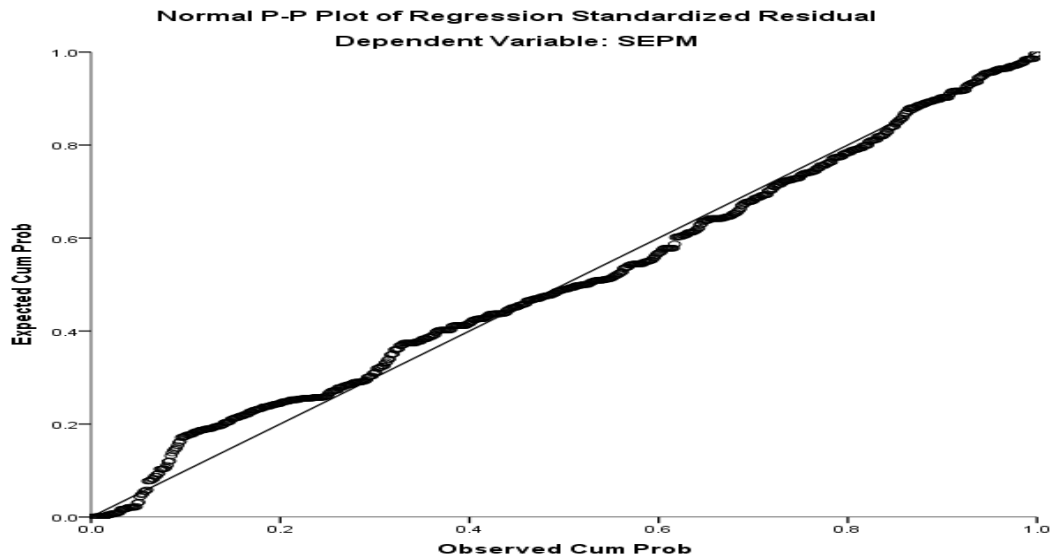


Figure 11: SEPM P-P plot of expected and observed normality scores

Source: Survey data, 2016

This deviation probably has implications for variance analysis using the SEPM factor in this study based on normality violation when subjected to general linear models (GLMs) during hypothesis testing. Indeed, an insightful revelation about the likely performance of the dependent factor (SEPM) in this study with implications for data-driven analysis in deconstructing how technology and cognitive traits likely explain students' entrepreneurship propensity in the Ghanaian context.

Empiricism and objectivism are two essential characteristics of scientific research (Cohen et al., 2007; Tashakkori et al., 2011). Therefore, researchers strive for replicability based on objectivity and empirical proof of findings (Tabachnick & Fidell, 2013). By inclination, visualisation alone to report empirical data could be problematic for the scientific world that relies on precision in measurement and hypothesis testing (Kantowitz et al., 2009). Whilst appreciating the exploratory data analysis (EDA) techniques using descriptive statistics widely developed by John Tukey as important for paying attention to detail examination for patterns in raw scores, Howell (2010: 5) considers EDA alone for data mining as “superficial” and proposes the inferential

statistics to understand what the numbers depict. The simple 3D Scatter plot and P-P plots as visual diagnostic data tools to explore the strength of association between multiple variables might give room for inconsistent interpretations from different individuals, Howell bemoans. Such is the weakness of graphical and descriptive approaches to data exploration. Therefore, to provide an objective means of establishing contiguity in quantitative data, Pearson's Product Moment recommendation can be used as an explorative tool before significant testing (Field, 2009). Pearson's Product Moment attempts to establish a linear relationship between two (bivariate correlation) matrix variables (Hair Jr. et al., 2014; Robertson, 2002). Therefore, the linearity test in the sample data has been extended further to explore objective means of validating contiguity between the experimental variables in Table 10 (overleaf).

Table 10: Factors 1-7 Contiguity Analysis Using Pearson's r

Factor		CSTI	GTSE	SGGS	ELCM	nAch	RTBS	SEPM
CSTI	Pearson Correlation	1						
	Sig. (2-tailed)	-						
	N	709						
GTSE	Pearson Correlation	.337**	1					
	Sig. (2-tailed)	.000	-					
	N	709	709					
SGGS	Pearson Correlation	.215**	.275**	1				
	Sig. (2-tailed)	.000	.000	-				
	N	709	709	709				
ELCM	Pearson Correlation	.175**	.121**	-.058	1			
	Sig. (2-tailed)	.000	.001	.120	-			
	N	709	709	709	709			
nAch	Pearson Correlation	.250**	.417**	.242**	.139**	1		
	Sig. (2-tailed)	.000	.000	.000	.000	-		
	N	709	709	709	709	709		

	N	707	707	707	707	707		
RTBS	Pearson Correlation	.126**	.113**	.019	.312**	.232**	1	
	Sig. (2-tailed)	.001	.003	.615	.000	.000	-	
	N	706	706	706	706	706	706	
SEPM	Pearson Correlation	.144**	.178**	.005	.103**	.184**	.037	1
	Sig. (2-tailed)	.000	.000	.900	.006	.000	.331	-
	N	709	709	709	709	707	706	709

** . Correlation is significant at the 0.01 level (2-tailed). Source: Survey data, 2016.

Results of Pearson's r , the sample size, and p -values for the seven variates were measured on continuous scales in this study. Even though most of the bivariate statistics yielded significant p -values, this study's strength of associations between the seven constructs was statistically small. Proudly, the low coefficient values also indicate no multicollinearity problems amongst the seven variates in this study.

Testing with 2-tailed and $\alpha = .01$, interesting relationships were seen in Table 10. Positive outcomes were recorded for CSTI and GTSE $r(709) = .337, p = .001$; 2-tailed); SGGS and CSTI $r(709) = .215, p = .001$; 2-tailed); ELCM and CSTI $r(709) = .175, p = .001$; 2-tailed); nAch and CSTI $r(709) = .250, p = .001$; 2-tailed); RTBS and CSTI $r(709) = .126, p = .001$; 2-tailed); SEPM and CSTI $r(709) = .144, p = .001$; 2-tailed); SEPM and GTSE $r(709) = .178, p = .001$; 2-tailed); SEPM and ELCM $r(709) = .103, p = .001$; 2-tailed); SEPM and nAch $r(709) = .184, p = .001$; 2-tailed); RTBS and ELCM $r(709) = .312, p = .001$; 2-tailed); RTBS and nAch $r(709) = .232, p = .001$; 2-tailed); nAch and GTSE $r(709) = .417, p = .001$; 2-tailed); nAch and SGGS $r(709) = .242, p = .001$; 2-tailed); including nAch and ELCM $r(709) = .139, p = .001$; 2-tailed).

The current study is interested in how the five cognitive variates significantly relate to the SEPM Factor for Hypotheses 1 to 3 and the covariate (CSTI) in H_01 . Good performances have been recorded for three (SGGS, ELCM, and nAch) and not for

SGGS and RTBS with SEPM Factor. Similarly, below moderate [$r = .144$ (SEPM) and $r = .337$ (GTSE)] relationships have been observed for the covariate (CSTI) and can be considered a good associate of the cognitive and the entrepreneurship propensity in this dissertation.

Conversely, non-significant results were recorded between SGGS and ELCM ($r(709) = -.058, p > .05$; 2-tailed); RTBS and SGGS ($r(709) = .019, p > .05$; 2-tailed); SEPM and RTBS ($r(709) = .037, p > .05$; 2-tailed); as well as SGGS and SEPM ($r(709) = .005, p > .05$; 2-tailed). Such non-significant findings were prior indications of a lack of predictive power in the current study's final models for hypotheses 1 to 4. The lack of associations reported in Table 10 might represent coefficient values not derived from the targeted population. Hence, the observed weak relationship could be because of sampling errors or some extraneous variables in this study. Hair Jr. et al. (2014) describe bivariate profiling of group differences of one or more metric variables.

In sum, below moderate significant associations ($r = .121$ and $r = .417$) were observed between the remaining constructs with the need for achievement (nAch) and general task self-efficacy (GTSE) scores recording the highest coefficient ($r(707) = .417, p < .05$). The correlation figures reported in Table 10 hold significant implications for career counsellors whilst they provide cognitive and entrepreneurship counselling to students. Another important implication for the linearity test with the survey data showed that sphericity, singularity, and multicollinearity were not issues of concern amongst the seven factors in the current dissertation. Thus, assurance was gained in the sample scores that each of the seven constructs independently measured different factors, thereby enforcing construct and content validity in the survey data and paving the way for multivariate statistical model applications as recommended by Jain (2011) to account for several covariates proposed as influencing entrepreneurship propensity.

3.10.4 Multivariate Normality Tests for the Survey Data

Instructively, Hair Jr. et al. (2014) draw researchers' attention to the urgency of testing assumptions underlying statistical models twice – first for separate variates akin to univariate techniques and second for variables in multivariate modelling. By extension, Hair Jr. et al.'s submissions on the number of times statistical assumptions should be tested are within the context of interpretations that come with omnibus tests such as MANOVA and the post hoc results generated from multivariate tests. Hence, the current section proceeds with multivariate assumptions following the univariate tests in this chapter.

Another crucial assumption underlying inferential statistics is the test of normality. The normal curve refers to a particular shape of the frequency distribution and is believed to represent occurrences in the natural world, hence the name 'normal' (Howitt & Cramer, 2011, p. 33). Similarly, Tabachnick and Fidell (2013, p. 78) explain that underlying multivariate procedures and most univariate statistical tests are the assumption of multivariate normality, which means that the residuals of each covariate in a statistical model are normally distributed. In behavioural research, statistical significance testing is dominated by testing means and generalisation to the population parameters (Howell, 2010). Estimations and assumptions guiding inferential statistical models have been a bane to some social scientists during hypothesis testing. Field (2009) submits that readers must own their data by exploring such assumptions to avoid spewing out spurious statistical results. Therefore, researchers often attempt to establish the distributions of their scores before hypothesis testing as they strive for their data to attain a population mean of θ with an *SD* of I . Standard normal distribution accounts for the population mean and the *SD* scores from a sample data with probability density function regulated by the mean along the abscissa (x-axis) and the *SD*

accounting for the shape of the scores (Robertson, 2002; Howell, 2010; Heiman, 2011). The take home on normal distribution is that researchers have to take note of their *SD* score as the larger the *SD*, the more significant the variability and spread out the scores, and smaller *SD* provides compact scores (Field, 2009).

Despite the crucial role the normality test plays in predicting outcome variables in most univariate and multivariate procedures, Tabachnick and Fidell (2013) believe that testing an infinite number of linear combinations of variables for normality distribution is impractical. Using the graphical approach to normality check with behavioural data (Hair Jr. et al., 2014; Howell, 2010), Figure 10 shows a normal distribution of mean scores on a scale of 1-6 obtained by sampled students from three Ghanaian public universities for this study.

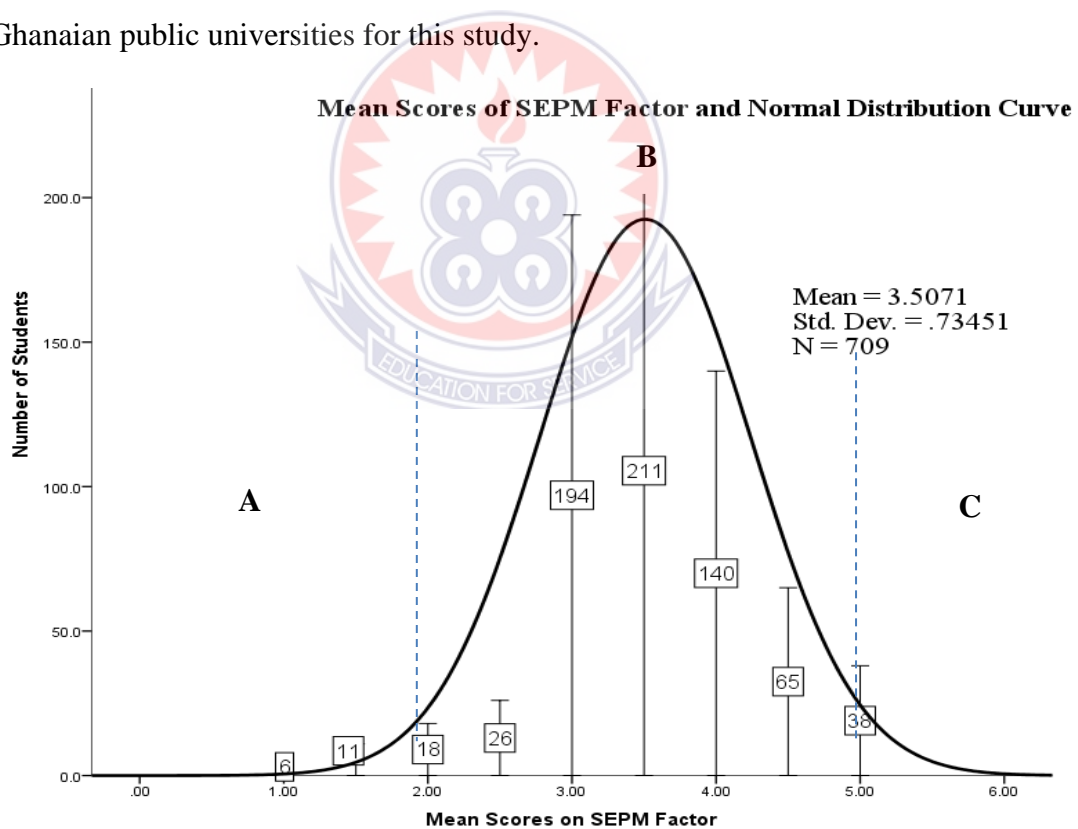


Figure 12: Histogram of SEPM mean scores under normal curve

The spread of scores showed 89.70% (n = 636) of respondents' mean scores fell under the bell-shape labelled 'B'. At the two points of inflexions, 4.94% (n = 35) mean

dovetailed to the extreme left (negative tail) of the distribution (labelled 'A'), with 5.36% ($n = 38$) dropping into the extreme right (labelled "C") of the shape. A seemingly slight deviation ($SD = .73$) relative to the mean of 3.5 indicated perhaps respondents expressed homogeneous views on their entrepreneurship propensity factor in this study.

Similarly, Figure 11 shows pictorial representations of the six cognitive factors with their mean and SD scores obtained by the samples on scales of 1-5. Generally, a cursory look at the figures depicts a seemingly normal distribution of scores on the six outcome variables in the MANCOVA model for Hypothesis 1. Thus, the distributions in Figure 11 showed that students' mean scores are under their respective bell-shapes (ELCM, RTBS, and CSTI) with GTSE, SGGs, and the need for achievement negatively skewed shapes displayed.

The six factors showed 3.46 students' mean score with .56 SD on average. The ELCM factor exhibited normally distributed scores, with almost all students' mean values plotted under the bell shape. This near-perfect distribution can be attributed to the small SD score of .39 to its mean of 3.12 upon visual inspection in Figure 11. The ELCM factor allows further investigation into what might account for the unanimous views expressed in future studies. The ongoing narratives on contiguity, sphericity, and normality tests have been based on comparing sample mean scores with population parameters. Still, no explicit attempt has been made to project the true population scores.

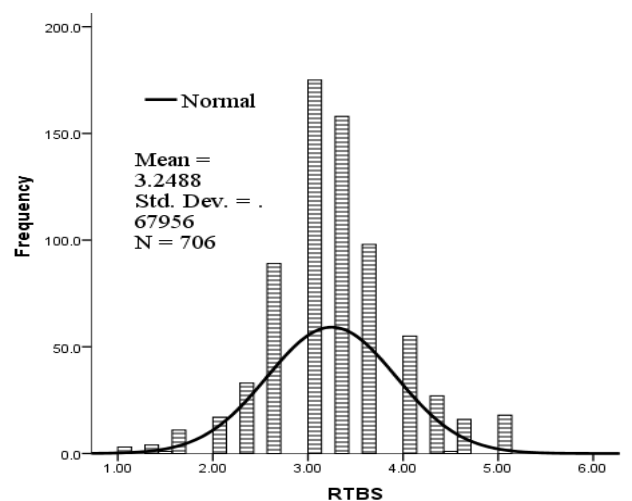
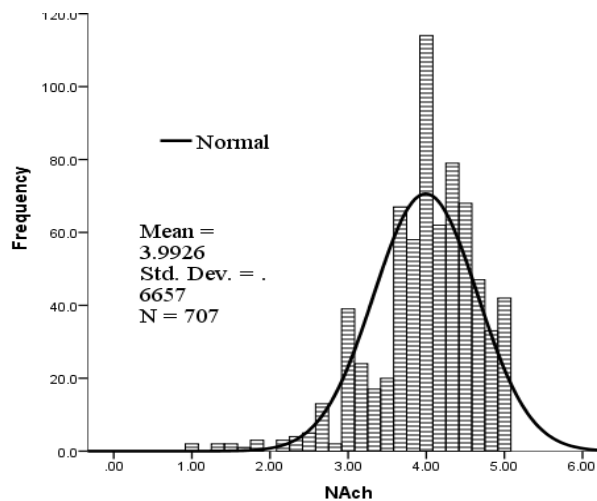
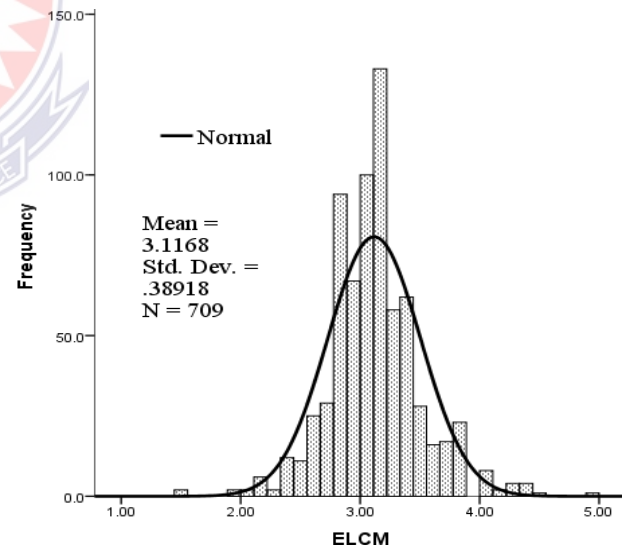
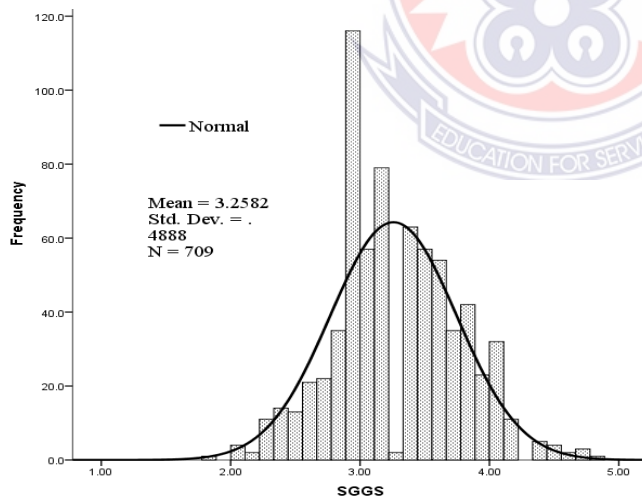
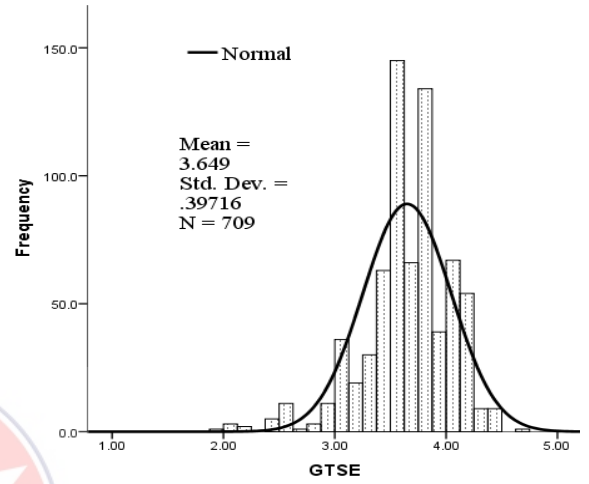
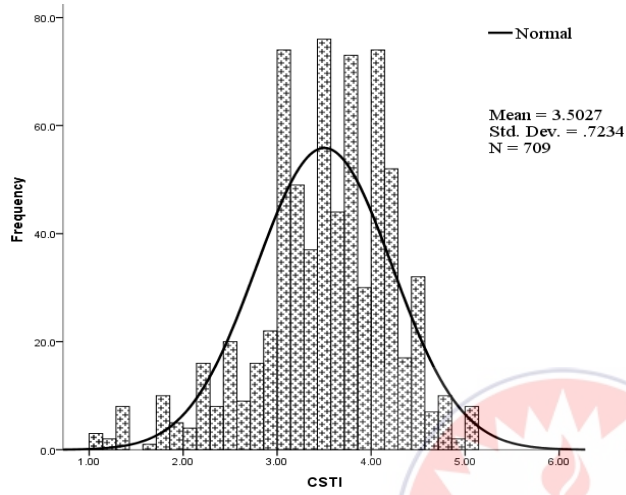


Figure 13: Distribution of students' mean scores in a normal curve

Figure 12 confirms the projections from a normally distributed population using a z -score approximation procedure. In accounting for β -values explaining an outcome factor, the raw scores on a scale are ranked and converted to z -scores, plotted alongside the expected z -scores from the population (Howell, 2010; Field, 2009). We expect the actual z -scores to be the same as the anticipated z -values from the population should the raw data usually be dispersed when plotted with a diagonal line through the data points. In addition, Field explains that most of the mean scores should be between 0 and ± 2 (based on the scale) in a study.

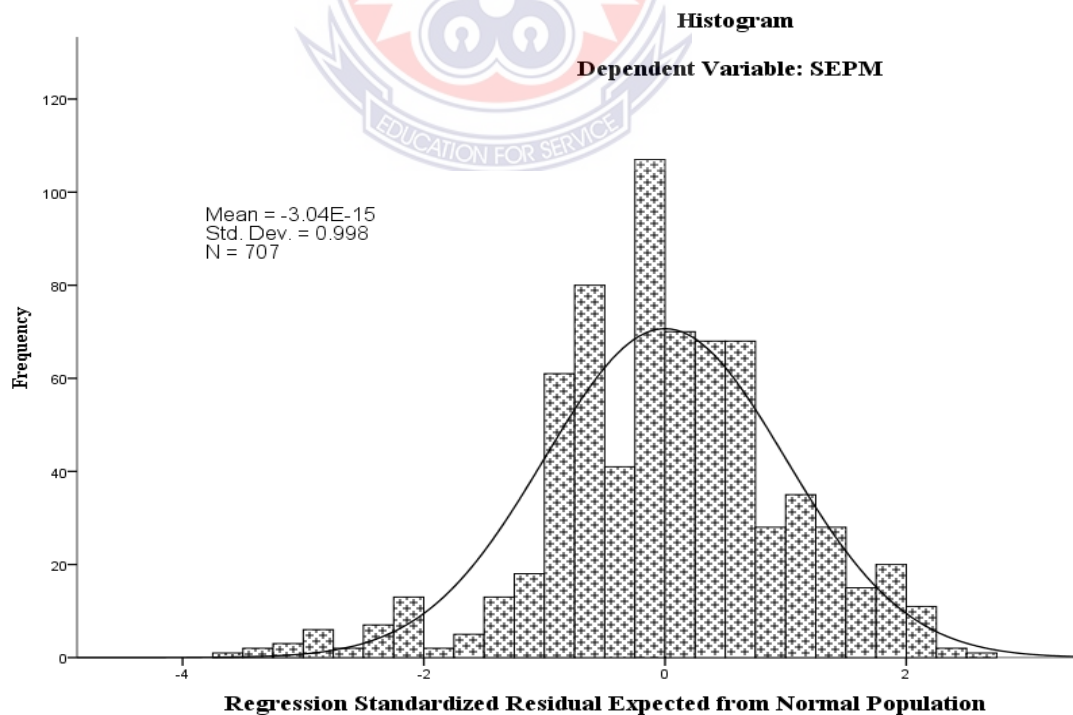


Figure 14: Standardized expected population mean for SEPM factor

In this study, entrepreneurship intention scores amongst students from the Ghanaian public universities (population) recorded a mean of -3.00004 (outside the 0 and $2\pm$ range) and SD of $.998$ (nearing 1); the z -statistics estimated the normal distribution mean scores of entrepreneurship propensity for the entire population for this study. On a scale used to measure the SEPM factor (experimental effect), a mean value of 3 represents 'moderate.' This equates to the population mean. In other words, the collective view of final-year business students from the seven public universities offering business education programmes expressed that they were sometimes driven to consider entrepreneurship propensity activities in this study.

In conclusion, using different graphical approaches such as Q-Q plots, scattered diagrams, and straight lines to measure normality in sample data can be problematic. Indeed, some statisticians express uncertainty in interpreting the population parameters from graphs (Hair Jr., Black, Babin, & Anderson, 2014) since one aim of using randomisation to collect sample data is to be able to generalise the findings to the population parameters (Jackson, 2009; Howell, 2010; Dancy & Reidy, 2011). For instance, it is difficult to say if the SEPM mean is -3 confidently. (Figure 11) Indeed, it originated from the population of interest due to sampling error or other extraneous variables in this study. Statisticians also believe that using graphs to gauge normality in data points can be subjected to discretionary interpretation since it can be challenging to spot deviations from the data (Field, 2009).

Hence, more reliable mathematical tests that account for the test statistics, including df , *sample size*, and the p -value of sample and population mean differences, are recommended (Field, 2009, p. 146). For instance, one can use the Kolmogorov-Smirnov (K-S) and Shapiro-Wilk tests that compare the raw data from the samples to estimated normally distributed values using the same mean and SD (Ofori & Dampson,

2011). The result of the normality assumption was interpreted as statistically significant if the probability value is higher than the conventional social science margin of error ($p > .05$). However, if $p < .05$, it means the residual scores (distribution) are statistically different from normality; hence, this should have implications for statistical model building in scientific research. As a result, the study subjected the dependent factor (SEPM) to Kolmogorov-Smirnov (K-S) and Shapiro-Wilk tests using sample size, standard error, and variance analysis to test the statistical significance of the deviation in the dataset. A p -value (*sig.*) value less than .05 is considered a deviation. Thus, $p > .05$ depicts sample means significantly different from the customarily distributed score in the study population (Field, 2009, p. 148).

Ofori and Dampson (2011) also recommended the K-S technique for estimating the normality of sample data in support of the graphical approaches. Field (2009) argues that while the two tests arrive at the same results, Shapiro-Wilk's test has higher power to calculate significant differences in score deviation from normality than the K-S technique. To fit the best multivariate and univariate suitable statistical models to the Research Hypotheses for this study, there was the need to mathematically confirm the uneven graphical distribution of means observed in Figures 7 to 13 by using probability testing methods developed by the Russians, Kolmogorov-Smirnov (K-S) and Shapiro-Wilk.

Others (Howell, 2010, p. 79; Field, 2009, p 150) have critiqued the inconsistency of the K-S test on sample size, that the test statistics seem consistently non-significant even with small and large samples with minor deviations from normality. Confining it to the history books, Howell, citing D'Agostino and Stephens, described the K-S test as a 'curious' statistical tool and said it should never be used. Such criticisms have not offered an alternative to the normality test other than the

existing K-S and Shapiro-Wilk results. So, this study adopted the pragmatist approach by confirming the K-S test with the Shapiro-Wilk test, which has a more remarkable power of predicting normality. Undoubtedly, the K-S test still provides researchers with an investigative tool to explore sample data with large sample sizes. Large samples often build confidence in statistical tools since the larger the sample, the closer to the population parameters based on the central limit theorem (Healey, 2009; Heiman, 2011; Hair Jr.et al., 2014).

Table 11 shows interesting outcomes for the normality test using the university and the seven factors measured in this study. Except for UEW students' mean scores on the SGGS Factor [$D(173) = .06, p > .05$], all the scores significantly deviated from normality on both the K-S and Shapiro-Wilk tests across the three campuses which is a confirmation of unevenly distributed mean scores in Figures 6 to 12.

Table 11: Tests of Normality for University and Measured Factors

	University	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
CSTI	UEW	.108	173	.000	.926	173	.000
	UCC	.116	159	.000	.964	159	.000
	UG	.086	374	.000	.958	374	.000
GTSE	UEW	.083	173	.006	.951	173	.000
	UCC	.200	159	.000	.913	159	.000
	UG	.112	374	.000	.959	374	.000
SGGS	UEW	.056	173	.200*	.992	173	.491
	UCC	.090	159	.003	.975	159	.006
	UG	.067	374	.000	.992	374	.038
ELCM	UEW	.091	173	.001	.967	173	.000
	UCC	.155	159	.000	.882	159	.000
	UG	.070	374	.000	.982	374	.000
nAch	UEW	.151	173	.000	.868	173	.000
	UCC	.136	159	.000	.955	159	.000
	UG	.135	374	.000	.936	374	.000
RTBS	UEW	.143	173	.000	.965	173	.000
	UCC	.205	159	.000	.915	159	.000
	UG	.148	374	.000	.959	374	.000

SEPM	UEW	.133	173	.000	.936	173	.000
	UCC	.200	159	.000	.904	159	.000
	UG	.168	374	.000	.922	374	.000

*. This is a lower bound of the true significance. *a.* Lilliefors Significance Correction.

Source: Survey data, 2016

Even when all the scores from the three campuses were computed independently, Table 12 confirms the significant results in Table 11, with even the SGGS Factor failing the K-S and Shapiro-Wilk tests for normality. The results confirmed that the non-normality scores projected in the wiggly shape of Figure 9 held significance for CSTI, GTSE, nAch, ELCM, RTBS, and SEPM Factors even with such a large sample (709) in this study. The K-S and Shapiro-Wilk results also have implications for finding normally distributed scores for the dependent factor (SEPM) in the chosen population based on the average score of 3 and *SD* of .998 (Figure 11), the normality test is significant [$D(706) = .16, p < .05$] for the SEPM factor (Table 12). Similarly, significant K-S results have been recorded by CSTI [$D(706) = .08, p < .05$]; GTSE [$D(706) = .13, p < .05$]; SGGS [$D(706) = .06, p < .05$]; ELCM [$D(706) = .08, p < .05$]; RTBS [$D(706) = .15, p < .05$]; and nAch [$D(706) = .13, p < .05$].

Table 12: Global Test for Normality with the Factors 1-7

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	<i>df</i>	Sig.	Statistic	<i>df</i>	Sig.
CSTI	.075	706	.000	.968	706	.000
GTSE	.128	706	.000	.945	706	.000
SGGS	.059	706	.000	.994	706	.005
ELCM	.081	706	.000	.965	706	.000
nAch	.132	706	.000	.937	706	.000
RTBS	.146	706	.000	.960	706	.000

SEPM	.161	706	.000	.932	706	.000
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a. Lilliefors Significance Correction

Also, the *K-S test* for normality has been criticised as producing significant results with small and large sample sizes even when the scores with only slight deviations from a normal distribution (Afifi, May, & Clark, 2012; Hair Jr. et al., 2014; Heiman, 2011), this study saw this pattern as well with 706 cases failing to meet the normality criterion as well. Hence, *seven* factors could not be validated in this study with the presumption that such cognitive and entrepreneurship traits differed for individuals and might not be taught in schools. Hence, such non-normality scores are justified and have practical implications for career guidance experts.

Similarly, some argued that entrepreneurship initiatives are likely to be more dominant in cities than others based on prevailing conditions such as social structure, creativity, and community resources (Flora, 2006). Reflection on Flora's assumptions holds that it takes unique traits to be an entrepreneur, and not everyone, perhaps, is endowed with such traits. A contribution of this study is an attempt to explain how cognitive and technological factors are likely to predict entrepreneurs in Ghana's public universities. Subsequently, this study views the results from the normality tests in Tables 12 and 13 in light of students' unique dispositions and socio-cultural backgrounds in the Ghanaian context. Thus, students from rural and urban communities might have divergent views on the survey instrument in this study. Therefore, considering Tabachnick and Fidell's (2013) view on the difficulty of testing infinite covariates in multivariate analysis, the interpretation of the multivariate normality assumption in this study was carefully considered for further analysis, given the heterogeneity of individual views on the entrepreneurship factor.

3.10.5 Homogeneity of Variance Results

In addition to the normality test for MANCOVA, a crucial assumption for inferential statistics is the equality of variance test, also called homogeneity of variance. Though several univariate and multivariate tools can produce tests for the assumption of homogeneity of variance, Field (2009: 150) recommends that researchers explore their data rather than wait until the primary analysis. This is how significant it behaves the current study to understand how the 709 raw scores obtained from the survey deviate around their respective means on the seven metric factors (CSTI, GTSE, SGGs, ELCM, nAch, RTBS, & SEPM) for t-test, ANOVA, and multiple regression (Johnson & Wichern, 2014).

Using graphical and mathematical approaches to equal variances, results show the null hypothesis that variances of raw scores around their means for different participants are not significant ($p > .05$), using Leven's t-test or one-way ANOVA procedures (Kerr, Hall, & Kozub, 2002, p. 100; Godwin, 2010, p. 252). They state that when interval or ratio scales of measurement are used in an experiment with manipulative variables, inferential statistical procedures such as t-tests should be considered with other assumptions such as examining variability of each set of scores being compared are similar. Kerr et al. also recommended that if a significant ($p < .05$) result for an equal variance test projects homogeneity in scores for a variable, a decision on the type of inferential statistics needs to be considered. Another method for determining equality of variance in scores is using the chi-square test for homogeneity (Gaur & Gaur, 2009, p. 92) for multivariate statistics.

Commenting on some corrective measures adopted when the homogeneity test is violated, some statisticians observed that even when investigators check the assumption of homogeneity of variance with violations, they simply use a conservative

approach by increasing the *CI* level (α) from .05 to .01 or 0.025 in experimental research designs (Kantowitz et al., 2009; Tabachnick & Fidell, 2013; p. 86). They argued that the manipulations of the independent variables might have accounted for the variances observed around the mean (Field, 2009). Godwin (2010) also reminded researchers that if the standard deviations for compared variables varied, this should be of concern for the homogeneity of variance test. Indeed, whilst some researchers are content with data transformation to overcome homogeneity violations, Tabachnick and Fidell strongly believe that interpretations of results in such cases are mainly limited to the transformed scores. The normality assumptions for the seven factors had mixed challenges in this study. Nevertheless, only two factors passed the homogeneity of variances test for univariate analysis (Table 13). The current study considered homogeneity of variance tests in the outcome factors as of no consequence since the α -values reported for hypotheses 1-4 and similar other supplementary findings invariably recorded stringent probability scores of .001 in most cases, thereby adhering to Tabachnick and Fidell's (2013) recommendations. Table 13 shows significant α -values for GTSE ($F(2, 703) = 4.64, p < .05$) and SEPM ($F(2, 703) = 9.56, p < .05$). Hence, the two factors violated the assumption of equal variances in this study. However, the variations were equal in scores for CSTI ($F(2, 703) = .40, p > .05$); SGGS ($F(2, 703) = 2.39, p > .05$); ELCM ($F(2, 703) = 1.58, p > .05$); nAch ($F(2, 703) = .07, p > .05$); and RTBS ($F(2, 703) = 1.49, p > .05$).

Table 13: Test of Homogeneity of Variance

Based on Mean Scores	Levene's			
	Statistic	df1	df2	Sig.
CSTI	.404	2	703	.668
GTSE	4.638	2	703	.010

SGGS	2.386	2	703	.093
ELCM	1.584	2	703	.206
nAch	.065	2	703	.937
RTBS	1.494	2	703	.225
SEPM	9.555	2	703	.000

Source: Survey data, 2016

Based on the homogeneity of variance results, the variance ratio of 3.58 for the seven factors was obtained by dividing the least variance factor (ELCM = .151) by the highest (SEPM = .541) in this study (see Appendix H6 footnote). Therefore, the findings on equal variances assumed have statistical implications for hypothesis testing in Section 3.11.

3.10.6 Heuristic Judgments for Univariate Assumptions

The final group of inferential statistics assumptions testing are based on value judgements by the researcher since they are not tested graphically or mathematically. These are the metric scale and independence of score judgements. In the field of social research, Babbie (2010, p. 232) explains the origin of the term ‘independent’ from the works of conventional experimental designs involves three major elements: (i) independent and dependent variables, (ii) pretesting and post-testing, and (iii) experimental and control groups. However, in quasi-experimental and survey research designs that involve humans, the concept of ‘independence’ comes in two fronts: manipulating experimental variables or ensuring individuality in response to survey instruments (Johnson & Christensen, 2008). The latter is a requirement for statistical model building, simply ensuring that an individual does not submit multiple questionnaires or tests to conclude that the behaviour under consideration independently exists in the population. When an individual produces two or more instruments or questionnaires, bias is introduced, and the reliability of the results is

likely to be influenced. Scores' independence significantly affects types of statistical tools since some tests are suitable for repeated measure designs or independent samples (Healey, 2009; Howitt & Cramer, 2011). ANOVA (e.g. repeated measures design) and t-test (e.g. exact sample t-test) are examples of statistical tools to account for confounding variables likely to bias statistical outcomes (Huck, 2012).

Another condition for hypothesis testing requires that researchers identify the measuring scale for variables in behavioural research. A set of numbers representing a range of figures for a construct is called a scale (Gall, Gall, & Borg, 2010). Others classify scale into four nominal, categorical, ordinal, and ratio. However, this study adopts Hair Jr. et al.'s (2014) categorisation of the research scale as metric and non-metric. Non-metric scales simply group categorical and nominal scales, often dichotomous, while metric scales combine ordinal and ratio scales. Metric scales usually provide wide ranges of scores and variability measure supports. Therefore, in the survey data administration, independent scores were ensured by advising participants to express their opinions on items without seeking help. Besides, Part A1 to Part C of the questionnaire in this study measured the seven significant factors on a Likert-type scale, whilst demographic data was collected with a nominal scale. Evidently, independent of raw scores and metric and non-metric dataset collections conveniently informed the types of statistical tools selected to test Research Hypotheses 1 to 4 in Section 3.11 and social science research (Babbie, 2010).

3.11.0 Case Study Approach for Research Question 2

Based on the complexities surrounding mathematical models' ability to predict entrepreneurship events (MacMillan & Katz, 1982), Bruyat and Julien (2000) propose a departure from the quantification literature in favour of interpretivism approaches that focus on longitudinal studies and mega-analytic perspectives to issues in the field of

entrepreneurship. Therefore, Research Objective 2 (RO2) explored students' lived experiences on their curriculum and its relationship with indigenous knowledge systems. Voice data was generated from 11 final-year students' focus group discussions at a Ghana public university.

Themes are issues emanating from coding in qualitative studies (Yin, 2011). Coding is breaking down, examining, comparing, conceptualising, and grouping data (Given, 2008). Consequently, the interview data from the field was analysed with NVivo™ Version 10 software using *in vivo* coding practices (Creswell, 2012: 244) that allowed thematic appreciation of views. According to Given, *in vivo* coding practices allow qualitative data analysts to highlight and drop narratives into explorative and interrelated codes using themes. *In vivo*, coding is similar to the manual approach to qualitative data management, where cases are grouped under familiar concepts and themes. Creswell also suggested that qualitative researchers adopt *lean coding* practices, where few codes are assigned in a manuscript as part of an *in vivo* approach to data interpretation. However, the power of the Nvivo™ program provides users with some flexibility in data management and reporting. More so, the inductive approach to thematic identification (Lee, 1991) guided the coding practices in this study. In addition, qualitative researchers often vary approaches in data coding. For instance, quoting Strauss and Corbin's definition of axial coding, Bryman and Burgess (1994: 5) explained that axial coding, called nodes in TMNVivo terms, involves a series of procedures whereby qualitative data are grouped into new ways after open coding and establishing connections between categories or themes discovered from the data. The interview data was generated from cases of the two homogenous groups that comprised 11 participants in this study.

Unlike the *priori* approach to quantitative data management processes and the

inductive data coding method, researchers often allow theories and concepts to emerge from data (Johnson & Christensen, 2008). Yin (2011: 101) further clarifies that qualitative research findings should show “whether and how” the narratives' views are supported or disproved by the theory of engagement in a study. Yin's views are somewhat a departure from the quantitative school of thought that leads research with theory (*priori*).

Cohen et al. (2007) feared that qualitative data could overwhelm beginning researchers. Others have recommended different computer packages to manage qualitative data processes (Given, 2008; Creswell, 2012; Johnson & Christensen, 2008). Hence, the study used iterative examination, connection, and re-examination processes by focusing on the conceptual meanings of dependent variables (Glaser & Strauss, 1967). The coding process for this study generated 95 axial codes made up of parent, child, and grandchild nodes, which enabled this study to explore nuances in cases' narratives with NVivo™ Version 10 software.

Axial coding was proposed initially by Anselm Strauss and Juliet Corbin as a procedure for managing data in their groundbreaking grounded theory approach in qualitative study involving open coding, where raw data (e.g. interviews, field notes, and images) were grouped into ideas, concepts and labels (Given, 2008). Given further, relationships are identified, tidied out, and pursued in-depth to identify key categories and ultimately describe, define, analyse, and explore a phenomenon. Interviews are conducted, and codes are generated. The researcher is also considered part of data generation in qualitative study (Stake, 2010). Hence, the choice of NVivo™ Version 10 as a computer tool for analysing the interview data in this study made it easier for me to reach *saturation* in generating nodes, offering reflexivity, and interpreting case narratives for RO2.

Besides the data analysis approach employed in the present study, my positivist orientation governing scientific knowledge generation heavily influenced an attempt to aggregate responses into graphs. Customarily, the study adopts the reductionist approach by Bryman and Burgess (1994) to code case narratives to establish patterns for interpretation. However, interpretivists' reflexivity, bracketing, and interpretation tools were applied to the FGD data in the results chapter.

Secondly, the narrative data from the FGDs was based on the PRA framework (see Section 3.7) for answering Research Question 2, which seeks to explore students' views on Indigenous knowledge systems and business education curricula in the Ghanaian context. More so, supplementary discussions on technology integration and entrepreneurship knowledge were employed as anecdotes for the results discussion of RO1 in '*Discussion of Key Findings*' in Chapter 5.

Using axial coding, 12 parent nodes were coded (Appendix K) in Nvivo software and reduced to six children nodes that achieved saturation at stage three with three broad themes that emerged from the discussants' FGDs data. For instance, Figure 15 shows the six nodes further collapsed into three broad themes based on common issues such as '*practical education needs*', '*formative assessment*', and '*curriculum confidence*' integrated into students' concerns as the most prominent word count from the transcribed data (Figure 15).

Derivative themes of *practical education* designate students' views on relating theory to practice, where they expect their learning experiences to link to industry practices. Secondly, the *formative assessment theme* explored students' opinions on their curriculum and its relationship with engaging learners' prior knowledge in the school system by teachers. The study also used *curriculum confidence* to describe students' lack of faith in the competency they gained while leaving school.

3.12.0 Research Ethics Guiding the Study

Creswell (2012) elucidated that we need to adopt sound ethical practices in all steps of the research process. However, he quickly added that practising ethics involves more than just following static rules. Hesse-Bieber and Leavy (2006) also recommended that we be ethical and guided by primary considerations rather than addendums, which must be at the vanguard of our research agenda. Creswell points out that of all the processes in the research business, ethics tends to be more associated with data collection, reporting, and distribution of reports than any other phase of the study. Hence, the current segment reviews basic ethical considerations guiding access to study sites, no harm to the participants, and data analysis. Specifically, issues of anonymity, confidentiality, seeking consent, invasion of privacy, and deception governing the research project are covered in this section.

Gatekeeping Roles

Thus, this study strictly adhered to the institutional regulations of the sites where data was collected. Respect was shown by gaining permission from multiple gatekeepers (university administrations to academic departments) before entering their premises for data gathering during the study (see Appendix A for Introductory Letter). Minimal destruction was guaranteed in the data collection process as well. Authorities were involved in getting students voluntarily to participate in data collection for this study. In addition, observation of gatekeeping roles ensured that the current study's invasion of participants' privacy was minimised.

Informed Consent and Confidentiality Clauses

Similarly, participants' consent forms were provided to students for ethical reasons (Appendix B). Similarly, the study adopted Cohen et al.'s (2007) guidelines of

not depriving subjects of helpful treatment. Hence, the introductory Message contains facilitations information to survey respondents explaining the purpose of the current study and their voluntary participation was required. Besides the helpful treatment of participants, Creswell (2012) entreats researchers to protect their participants' confidentiality even when they can identify a given individual's response, but essentially guarantees that they will not do so publicly.

Given Creswell's admonition to keep participants' views out of possible identification, both survey respondents and FGD participants were guaranteed non-disclosure clauses that prevent results publication skewed towards parochial interest or for revealing the identity of my research participants in this study. Therefore, research volunteers in this study were assured of complete anonymity, and that only group data would be reported in line with the welcome message in Appendix C. The Confidentiality clause also includes the anonymity of research subjects whose identity and responses cannot be directly identified (Given, 2008, p. 16). Similarly, pseudonyms based on popular Ghanaian identities were used for discussants to enforce confidentiality and anonymity in the final reportage of the qualitative data in this study as well (see sample in Appendix D5). Given emphasised, anonymity can also facilitate candid disclosure of sensitive information whilst protecting interviewees' privacy and safety interests.

Nevertheless, Stake (2010, p. 207) suggests that anonymity is a weak form of protection, and the most potent way is to respect a participant's privacy (not to know their private matters). Stake vehemently protests researchers' solicitation of privacy information that is not closely related to the research questions. Consequently, participants in the FGD groups were briefed before and after the interviews about their right to privacy with their voluntary participation. Besides the PRA framework, where

two homogeneous groups were interviewed separately, it also gave participants confidence that group views were more important in the FGD than individual responses (see Appendix D2's Welcome message for FGD). In addition, no such emotional and private data on family history and psychosis information were solicited during data collection.

Data management practices equally have implications for protecting research participants from potential harm. Recording, screening, analysis, and storage of participants' interview and survey data could expose a researcher to violating ethical standards in social and behavioural research. Therefore, all forms of electronic data gathered using digital voice recorders and data capturing software such as IBM SPSS, NVivo, and MS Word Processors were encrypted against data theft, as Pratt & Adamski (2005) recommended.

Participant Deception

Concealing my identity as a researcher in this study was needless. According to Babbie (2010: 70), deception in a research project is unethical, compelling different interpretations of scientific data. Babbie also says lying about a research purpose is dishonest and deceptive. Participants were debriefed at every material stage of the research, and research goals were clearly articulated orally (FGD) and written (survey instrument).

In conclusion, the high level of ethical considerations in gathering this study's qualitative and quantitative data was also to ensure that participants' and respondents' rights and privileges were not unduly infringed upon. Nevertheless, the ethical principles adhered to in this section vigorously enforce the validity of the data to test the thesis statement put forward that cognitive, technological, and entrepreneurial developments are strong predictors of employment creation in the knowledge society

today with guidance and counselling dilemmas for schools, businesses, and individuals.



CHAPTER FOUR

FINDINGS

This chapter answers the two research questions guiding the study in two sections. Section 1 used the survey (quantitative) data to test Research Objective 1 (RO1), whilst the second segment explores students' FGD narratives for themes concerning Research Objective 2 (RO2) using a parallel sequential mixed method design. Research Question 1 used a survey design to examine the influence of technology integration cognitive and personal characteristics on students' entrepreneurship propensity from Ghanaian public universities. Upon factor analysis (Section 3.4) and parametric assumptions testing (Section 3.8), four experimental hypotheses were formulated in line with the *Theoretical and Conceptual Framework* for this study (Figure 1). However, Research Question 2 explored students' experiences with indigenous knowledge systems, ICT integration, entrepreneurship, and business curriculum concerns with interpretivists' research strategies.

Continuing, the required statistical assumptions and best practices governing the null-significant hypotheses testing (NSHT) and case study analysis were explored before results for RO1 are presented in this chapter. Finally, based on significant results from the three hypotheses, post-hoc tests are conducted with supplementary hypotheses, and the findings are also presented. Because the study had no prior knowledge of experimental differences in the outcome factors from literature or theory, a post-hoc test was chosen instead of planned contrast.

4.1.0 Results of Research Question 1

The four main null hypotheses (Section 3.10) were tested using multivariate. However, univariate statistics were used for the supplementary findings within the rules of NSHT. Null Hypothesis 1 (H_{o1}) tested predictors of business students' level of entrepreneurship propensity using one-way MANCOVA (Section 3.8.1). Discriminant function analysis was used for research Hypotheses 2 and 3. Specifically, loglinear analysis was used to account for entrepreneurship propensity groupings based on students' traits (H_{o2}) and institutional factors (H_{o3}). Finally, Hypothesis 4 uses hierarchical logistic regression to predict students' self-efficacy, goal-setting, and stages of technology adoption scores for gender categorisation in the study.

4.1.1 Hypothesis 1: SEPM Levels as Predictors of Cognitive Traits

Null hypothesis 1 (H_{o1}) sought to predict students' entrepreneurship intention using technology and cognitive predictors. Entrepreneurship propensity levels were used as the experimental effects based on MANCOVA rules with computer integration literacy as a covariate and cognitive factor as an outcome factor to model a linear relationship using a multivariate technique in this study. Thus, using multivariate tests, the results of H_{o1} are presented in Table 14 (overleaf). Collectively and individually, the study predicted the influence of entrepreneurship propensity categories on students' cognitive traits using a one-way MANCOVA test. The result showed that the experimental effect (SEPM Levels) had a strong statistical difference ($F(10, 1396) = 5.04, p < .05$) between the five outcome variables and the outcome factors (cognitive traits) in this study.

The four tests for one-way MANCOVA indicated a significant predictive effect between the experimental effect (SEPM) and the dependent variables (cognitive traits),

with the CSTI factor as a strong covariate in the model. The Pillai's Trace was significant regarding the five cognitive factors ($V = .07$, $F(10, 1396) = 5.04$, $p = .001$). Using Wilks' Lambda, a statistically significant effect ($\Lambda = .93$, $F(10, 1396) = 5.07$, $p = .001$) was also reported between students' category of entrepreneurship propensity and cognitive factors. Hotelling's Trace showed a statistically significant effect ($T = .07$, $F(10, 1396) = 5.10$, $p = .001$) between students' category of entrepreneurship propensity and cognitive factors. Finally, Roy's Largest Root also produced a statistically significant ($\Theta = .06$, $F(5, 699) = 8.45$, $p = .001$) finding between the category of entrepreneurship propensity and cognitive factors in this study.

Table 14: MANCOVA Tests for Hypothesis 1

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial η^2
Intercept (DVs)	Pillai's Trace	.852	805.102 ^b	5.00	698	.001	.852
	Wilks' Lambda	.148	805.102 ^b	5.00	698	.001	.852
	Hotelling's Trace	5.767	805.102 ^b	5.00	698	.001	.852
	Roy's Largest Root	5.767	805.102 ^b	5.00	698	.001	.852
CSTI(covariate)	Pillai's Trace	.154	25.386 ^b	5.00	698	.001	.154
	Wilks' Lambda	.846	25.386 ^b	5.00	698	.001	.154
	Hotelling's Trace	.182	25.386 ^b	5.00	698	.001	.154
	Roy's Largest Root	.182	25.386 ^b	5.00	698	.001	.154
SEPM Level (IV)	Pillai's Trace	.070	5.037	10.00	1398	.001	.035
	Wilks' Lambda	.931	5.068 ^b	10.00	1396	.001	.035
	Hotelling's Trace	.073	5.099	10.00	1394	.001	.035
	Roy's Largest Root	.060	8.446 ^c	5.00	699	.001	.057

Source: Survey data, 2016

Note: *a.* Design: Intercept + CSTI + SEPM Group; *b.* Exact statistic; *c.* The statistic is an upper bound on *F* that yields a lower bound on the significance level.

Considering the strength of multivariate statistical models, all four tests

produced highly significant results in this study, which confirmed the confidence in the survey data despite a few assumptions that were not tenable, which have been reported in Section 3.18. Refreshingly, the study considered the 1.55% (11) missing data in the model negligible, leaving 698 sample size for the simulation. In addition, the one-way MANCOVA model produced a $df(5)$ from the six covariates.

Using partial eta squared (η^2_p) to account for the percentage of variances explained by the variables in the one-way MANCOVA model, the omnibus results in Table 14 also produced large effect sizes in this study. According to the four statistical tests (V , A , T , & Θ), over 85% (η^2_p) of students' cognitive traits are statistically explained by their stages of entrepreneurship intentions. Thus, all the four test statistics showed highly significant eta squared individually - η^2_p ($V = .85$, $F(5, 698) = 805.10$, $p = .001$; $\eta^2 = .852$); η^2_p ($A = .15$, $F(5, 698) = 805.10$, $p = .001$; $\eta^2 = .852$); η^2_p ($T = 5.77$, $F(5, 698) = 805.10$, $p = .001$; $\eta^2 = .852$); and ($\Theta = 5.77$, $F(5, 698) = 805.10$, $p = .001$; $\eta^2 = .852$) - in the experimental effect.

Excitingly, the five cognitive variates also predicted over 15.4% (η^2_p) error variances in technology integration literacy, representing a moderate effect size on the four MANCOVA tests, whilst the predictor variable (SEPM Group) alone explained a small effect size between 3.5% (V) and 5.7 (Θ) in Table 14.

Further post-hoc analysis on the η^2_p revealed a robust statistical ground for the variances explained in the current study. Statisticians recognised that in conservative terms, a mean sum of squares (SS_M) = 69.159 should be questioned based on multicollinearity (Field, 2009). The TOL range recorded for the five dependent variables (Table 17) was between .779 (GTSE) and .895; all are higher than the 0.1 criterion proposed by Menard (1995). In addition, Myers (1990) suggested that when a variance inflation factor (VIF) is ≥ 10 , researchers should be concerned about

multicollinearity. Mayer's suggestion is insignificantly tenable for the five cognitive factors with values between 1.12 (SGGS) and 1.30 (nAch) in this study (see Table 17). Therefore, on account of η^2_p determination for the cognitive factors in the MANCOVA regression, it is significant to conclude that mental traits present great lessons for predicting students' behaviours and attitudes on behavioural outcomes such as computer literacy in Ghanaian public universities.

Subsequently, the study rejected the H_0 and adopted the H_{A1} , which controls for intervening variables of technology integration. In a MANCOVA model, business students' cognitive traits would be a statistically significant predictor of their entrepreneurship propensity. Therefore, the current study concluded that collectively, the experimental effect (students' entrepreneurship propensity) had statistical contributions to how students develop self-efficacy, grit goals, economic locus of control, risk propensity, and need for achievement in this study.

4.1.2 Discriminant Function Variates for Hypothesis 1

Multivariate statistics' power to detect main effects in our experimental and control groups is resilient, but they reveal nothing about each variate's and covariate's contributions in their omnibus tests (Hair Jr. et al., 2014). Consequently, researchers are advised to resort to univariate statistics such as t-tests and ANOVAs to explore such details using a discriminant function template (Tabachnick & Fidell, 2013). Tabachnick and Fidell explain that the objective of a discriminant analysis is to predict group membership (categorical predictor) from a set of continuous outcome variates. However, Field (2009) discounts using univariate models to establish group differences in multivariate analysis when the omnibus tests are statistically significant, describing such an approach as defeatist and advising that discriminant analysis should be

employed instead. The current study also sought to follow up the main MANCOVA result with a discriminant analysis of entrepreneurship group membership (*low, moderate, and high entrepreneurship awareness*) in Hypothesis 1. Thus, the study further explores the covariate (CSTI) contributions and the five cognitive outcome factors in post-hoc tests. Based on the examinations of the ANOVA and t-test tables accompanying the one-way MANCOVA results in this study, three categories of supplementary hypotheses were formulated, and conclusions were drawn appropriately. Tables 15 to 17 provide the basis for the follow-up tests.

From the last row of Table 15, the survey data revealed that as the covariate (CSTI) and cognitive scores shrink, the experimental effect (SEPM) alone explains significant error variances between 3.5% and 5.7% (Table 14). However, the MANCOVA model alone failed to explain individual group membership of entrepreneurship propensity levels of students in the current study. Hence, Supplementary Hypotheses 1 to 4 were formulated as post-hoc tests to explore the emergent findings from Research Hypothesis 1 in this study.

4.1.3 Supplementary Finding 1: SEPM and Cognitive Factors

Using discriminant function from the main MANCOVA model for this study, *supplementary Hypothesis 1 (sH1)* explores which individual variates explain the level of students' entrepreneurship in this study. The *sH₀₁* states that *the variates in Hypothesis 1 would not individually account for students' levels of entrepreneurship propensity*. However, the *sH_{A1}* assumes that *the five covariates in Hypothesis 1 will individually explain students' level of entrepreneurship propensity in the current study*.

From Table 15, the results show that the percentages of systematic variations in the experimental effect (SEPM Level) individually explained by the five cognitive

variables when the covariate was removed from the MANCOVA model were statistically encouraging in this study. Specifically, the *Corrected Model* row shows the statistical contributions of the β –weights (Table 15 footnotes) with the *SEPM Group* row depicting the contribution of each variate towards SEPM group categorisation as:

- i) the GTSE factor significantly predicted 14.2% of variance ($F(5) = 5.754, \Delta R^2 = .142^a, p < .05$) in students' entrepreneurship and was statistically significant ($F(2) = 5.75, p < .05$) in the categorisation of entrepreneurship levels in this study,
- ii) the students grit goal-setting scores statistically explained a marginal 4.8% ($F(02) = .612, \Delta R^2 = .048, p < .05$) of factors contributing to students' entrepreneurship activities but not a significant ($F(2) = .61, p > .05$) predictor of entrepreneurship propensity levels,
- iii) Significantly, 4% ($F(5) = 6.85, \Delta R^2 = .040, p < .05$) of entrepreneurship initiatives were explained by students' ELCM factor. However, the ELCM covariate was not statistically significant ($F(2) = .49, p > .05$) when differentiating SEPM levels in the current study (same as Fagbohunge's (2012) finding in the African context),
- iv) students' desire to achieve greatness in life (nAch) had positively classified ($F(2) = 4.166, p < .05$) SEPM grouping and accounted for 8.4% variance errors in entrepreneurship propensity levels ($F(5) = 14.01, \Delta R^2 = .084, p < .05$) in the population for this study, and finally,
- v) 1.7% of factors contributing to developing entrepreneurship competency from Ghanaian public universities seem to have been significantly ($F(5) = 3.38, \Delta R^2 = .017, p < .05$) explained by students' willingness to take risks in life.

Conversely, the *sHI* also established that whilst explaining such marginal error variance ($\Delta R^2 = .17$) to the overall model explaining students' entrepreneurship, RTB

was such a poor predictor ($F(2) = .653, p > .05$) of entrepreneurship categorisation in this study.

Based on the results reported in *sH1* (i.e. *i-v*), the study accepted the *sH₀₁*. It concluded that, individually, all five cognitive variates were not good discriminators of entrepreneurship propensity levels without the covariate in the study. In summary, the *sH₀₁(i-v)* showed that even though SGGs, ELCM, and RTBS contributed marginally to entrepreneurship intention means scores, only GTSE and nAch covariates were highly statistically significant predictors of business student's levels of entrepreneurship propensity in the Ghanaian public universities. Thus, not all the cognitive covariates in testing Hypothesis 1 are good predictors of entrepreneurship levels in this study (even though statistically significant). Therefore, the current findings on cognitive factors have curriculum implications for entrepreneurship education amongst the youth.

4.1.4 Supplementary Finding 2: CSTI and Cognitive Variates

Secondly, Table 15 (overleaf) reveals that collectively, the covariate (CSTI) significantly predicted the five dependent factors in Hypothesis 1. Based on multivariate tests, the study used discriminant function to formulate *supplementary Hypothesis 2 (sH2)* to indicate the individual relationship between the covariate in the MANCOVA model and the cognitive variates. Hence, the *sH₀₂* sought to *predict a non-significant association between the CSTI and the five cognitive variates in the MANCOVA model*. However, *sH_{A2}* proposed that *there would be a statistically significant relationship between students' technology integration literacy and their cognitive traits*. The results in Table 15 show statistically significant relationships between the covariate (CSTI) and general task self-efficacy ($F(1) = 73.1, p < .05$);

students' grit goal-setting behaviour ($F(1) = 33.71, p < .05$); economic locus of control disposition ($F(1) = 15.33, p < .05$); need for achievement ($F(1) = 31.99, p < .05$); and propensity to take risks ($F(1) = 8.81, p < .05$).

Table 15 : Tests of Between-Subjects Effects Results

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	GTSE	16.492 ^a	5	3.298	24.279	.001
	SGGS	9.172 ^b	5	1.834	8.086	.001
	ELCM	4.964 ^c	5	.993	6.847	.001
	nAch	27.641 ^d	5	5.528	14.008	.001
	RTBS	7.669 ^e	5	1.534	3.377	.005
Intercept	GTSE	228.620	1	228.620	1682.818	.001
	SGGS	181.039	1	181.039	798.030	.001
	ELCM	196.973	1	196.973	1358.400	.001
	nAch	274.419	1	274.419	695.340	.001
	RTBS	202.577	1	202.577	446.064	.001
SEPM Group (<i>sH1</i>)	GTSE	1.563	2	.782	5.754	.003
	SGGS	.278	2	.139	.612	.542
	ELCM	.142	2	.071	.490	.613
	nAch	3.288	2	1.644	4.166	.016
	RTBS	.594	2	.297	.653	.521
CSTI (<i>sH2</i>)	GTSE	9.919	1	9.919	73.008	.000
	SGGS	7.647	1	7.647	33.707	.000
	ELCM	2.224	1	2.224	15.334	.000
	nAch	12.626	1	12.626	31.993	.000
	RTBS	4.000	1	4.000	8.808	.003
SEPM Group x CSTI (<i>sH3</i>)	GTSE	.990	2	.495	3.642	.027
	SGGS	.528	2	.264	1.164	.313
	ELCM	.043	2	.021	.147	.863
	nAch	1.668	2	.834	2.113	.122
	RTBS	.225	2	.113	.248	.780
Error	GTSE	95.099	700	.136		
	SGGS	158.800	700	.227		
	ELCM	101.503	700	.145		
	nAch	276.258	700	.395		
	RTBS	317.900	700	.454		
Total	GTSE	9508.409	706			
	SGGS	7668.454	706			
	ELCM	6972.435	706			
	nAch	11582.039	706			
	RTBS	7777.278	706			
Corrected Total	GTSE	111.591	705			
	SGGS	167.972	705			
	ELCM	106.467	705			

nAch	303.898	705
RTBS	325.568	705

Notes: a. $R^2 = .148$ (Adjusted $R^2 = .142$); b. $R^2 = .055$ (Adjusted $R^2 = .048$); c. $R^2 = .047$ (Adjusted $R^2 = .040$); d. $R^2 = .091$ (Adjusted $R^2 = .084$); e. $R^2 = .024$ (Adjusted $R^2 = .017$)

In addition, it should be noted in Table 15 that the errors and total variances were computed for the adjusted R -squared (R^2) for the five covariates in the MANCOVA test. However, on univariate statistics as the follow-up to multivariate models, Field (2009) recommends that ANCOVA be expressed in multiple regression terms to account for collective and individual variances explained in the covariate (s). Field contends that such regression analysis could help better understand the ANCOVA test. Since the ANCOVA model underpins the MANCOVA test in Hypothesis 1, $sH2$ was considered a post-hoc test to explore relationships between the covariate and the five outcome factors. In other words, the study estimated the population parameters from the survey data with the CSTI factor and the five cognitive traits in the MANCOVA model. As a result, the study accounts for the contributions of each category of the experimental effect to explain the CSTI factor with multiple regression and one-way ANOVA tests as follow-ups.

Table 16 shows that the mean scores of the five dependent variables and the CSTI factor were statistically significant. Therefore, the study accounted for the collective variance errors of the five cognitive variables in explaining the CSTI factor with a multiple regression model. The outcome of the regression model with the ANOVA statistics also confirmed the individual significant results obtained by the cognitive factors with the CSTI factor that produced a statistically significant difference ($F(5, 700) = 26.87, p < .05$) between all the five cognitive factors and the covariate's mean (see Table 16 for F -value). Therefore, the significant results in $sH2$ could not have occurred due to chance or sampling error in this study.

Meanwhile, Table 16 shows a significant moderate relationship ($r = .4; p < .05$)

between computer integration literacy and cognitive behaviours. Using the enter method in a linear regression model, the coefficient of determination also revealed that, indeed, business students' cognitive traits had significantly ($F(5, 700) = 26.87, p < .05$) predicted 15.5% ($\Delta R^2 = .155$) of variance errors in computer integration literacy amongst business education students in the Ghanaian public universities, in consonance with the partial eta squared in Table 14. Practically, the predictive power of the cognitive factors means that 85% of factors that inspire students to learn ICTs in public universities were not the subject of the current study.

Table 16: Model Summary CSTI (Predictor) and Cognitive Traits

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Change	R Square Change	F	df1	df2
1	.401 ^a	.161	.155	.666	.161	26.868	5	700	.000

a. Predictors: (*Constant*), RTBS, SGGs, GTSE, ELCM, nAch *b.* Outcome Variable (CSTI). $SS_T = 370.256$, $SS_M = 59.615$ and $SS_R = 310.640$ (From ANOVA table)

Even though the ANOVA tests in Tables 15 and 16 significantly predicted the relationship between the covariate (CSTI) and dependent factor (cognitive traits) with the overall percentage of variance contribution to the ΔR^2 (Table 16), their contributions were not known in both tables. Hence, the standardized β -values reported in Table 17 indicated a significant positive relationship between the covariate (CSTI) in the MANCOVA model (Table 15) and students' five cognitive traits measured in this study. The results denote that all things being equal, an increase or decrease in the CSTI covariate has a linear association with all the cognitive traits measured by a unit increase, except the RTBS scores that have no statistically significant association ($t = .89, p > .05$; $CI [-.043, .113]$) with the covariate in this study.

Significantly, Table 17 (overleaf) indicates that self-efficacy ($t = 6.12, p = .001$;

CI [.30, .58]); goal-setting ($t = 3.69, p = .001; CI [.09, .31]$); locus of control ($t = 3.59, p = .001; CI [.11, .38]$); and students' needs for achievement ($t = 2.37, p = .001; CI [.02, .19]$) were highly significant in the beta table for this study.

Practically, as a business student's confidence in mental traits is boosted, their technology integration skills are enhanced. In reverse, risky behaviours decreased when students' CSTI scores increased in this study. Thus, fear tends to inhibit students' intention to acquire relevant computer skills for the knowledge society. Curriculum design and technology guidance services can interrogate such interesting findings on the CSTI factor in this thesis. Another practical meaning of the β -weights in Table 17 shows that a unit change in self-efficacy scores will influence the outcome factor (CSTI) by .240 (SD) rating. Thus, as students' efficacious traits increase, they will likely increase their confidence in technology integration literacy. Similarly, a standardized deviation change for CSTI factor by students' economic locus of control (.132) and goal-setting (.135) by almost the same units. Need for achievement would record .094 (SD).

Table 17: Collinearity, Beta Values for Cognitive Predictors, and the Covariate

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% CI for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1 (Constant)	-.043	.320	-	-.134	.894	-.670	.585	-	-
GTSE	.437	.071	.240	6.122	.000	.297	.578	.779	1.284
SGGS	.200	.054	.135	3.685	.000	.094	.307	.895	1.117
ELCM	.247	.069	.132	3.593	.000	.112	.382	.883	1.132
nAch	.103	.044	.094	2.371	.018	.018	.189	.769	1.300
RTBS	.035	.040	.033	.890	.374	-.043	.113	.865	1.156

a. Dependent Variable: CSTI Source: Survey data, 2016

Specifically, students' survey scores significantly accounted for the CSTI variable using standardized β -weights individually. General task self-efficacy explained 24% ($\beta = .240$, $p = .001$), grit goal-setting measured over 13.5% ($\beta = .135$, $p = .001$), economic locus of control accounted for 13.2% ($\beta = .132$, $p = .001$), and students' need for achievement predicts 9.4% ($\beta = .094$, $p = .018$). Surely, based on the significant omnibus results in Hypothesis 1 that the CSTI factor was a strong covariate in the MANCOVA model (see Table 14), the study concluded that students' computer-specific technology integration literacy was a significant variable in tandem with students' cognitive traits development in this study (*sH2*).

Instructively, two practical significances emerged from the β -weights illustrations in Table 17 and the ΔR^2 (.155) in Table 14 for the *sH2*. These show that students' self-efficacy behaviour was vital to their technology adoption. The percentage of variance accounted for learning how to integrate ICTs into students' subject-specific curriculum, with 16% clarification in the current study. Conversely, cognition is a huge factor in developing entrepreneurship competency in the knowledge age, with 85% error variances predicted. Similarly, with total variance points of 370.256 in technology integration, the regression model explained 59.615 (16%) points, leaving 310.64 (84%) unexplained *F*-ratio (see Table 17) in this study. Further studies are required to explore factors that account for over 80% of successful technology integration practices for Ghanaian public universities. Whilst university authorities provide students with access to computers, personal attributes such as grit goal-setting, general task self-efficacy, need for achievement, risk-taking behaviours, and economic locus of control are more likely to impact students' computer integration into their curriculum. Therefore, the discriminant function used in *sH2* confirmed the predictive power of each cognitive factor in the relationship with the covariate in the MANCOVA model. The findings of

sH2 also have implications for technology education and career guidance practices for university students.

4.1.5 Supplementary Finding 3: K-Matrix for Cognitive and SEPM

The MANCOVA computation produced another type of discriminant function called the *K*-Matrix table using a simple contrast method to examine how SEPM levels varied on the five cognitive traits measured in this study. The *K*-matrix uses the independent sample t-test to explore group mean differences (Field, 2009). Therefore, *Supplementary Hypothesis (sH3)* examines collectively and individually which cognitive factors are the best fit for predicting students' *Entrepreneurship Levels* and technology integration skills in the current study. In furtherance of using discriminant function as a post-hoc test, *sH_{o3}* proposed that *the five cognitive variates would not differ significantly in combination on students' entrepreneurship levels, technology integration, and cognitive factors*. In line with NSHT rules, *sH_{A3}* estimates that *the covariates (technology skills) would statistically differ with entrepreneurship levels and cognitive traits*.

The results of *sH3* revealed (Table 15) that by combination, only CSTI and GTSE scores were significant predictors ($F(2) = 3.642, p < .05$) predictors of students' entrepreneurship levels. However, CSTI \times SGGS ($F(2) = 1.164, p > .05$); CSTI \times ELCM ($F(2) = .147, p > .05$); CSTI \times nAch ($F(2) = .2113, p > .05$), and CSTI \times RTBS ($F(2) = .248, p > .05$) were all not significant combinations for estimating entrepreneurship categorisation in this study.

The implications of Supplementary Hypothesis 3 for guidance and counselling curriculum design in universities can be considered. School counsellors interested in career development for their students must align their counselling and guidance

programmes with curriculum-specific technology training and self-efficacy training for entrepreneurship competency building. Besides, the significant finding for *sH3* reiterates the earlier submissions by change analysts that technology is continually altering jobs, society, and businesses in the knowledge society (Watts, 1998; Tractenberg, Streamer, & Zolingen, 2002; Thompson Jr. et al., 2005; Santos, 2004).

4.1.6 Supplementary Hypothesis 4: SEPM Levels and Cognitivism

Unfortunately, the *sH3* result is an omnibus ANOVA statistic that only tests the entrepreneurship group variances based on the covariates. As a follow-up to *sH3*, the study sought to test which covariates could be successful predators of students' entrepreneurship propensity levels. Levels of entrepreneurship propensity in this study were referred to as *low* (Level 1), *moderate* (Level 2), and *high* (Level 3).

Table 18 : Contrast Results (K Matrix) for SEPM Category and Cognitive Traits

SEPM (Grouping) Simple Contrast ^a		Dependent Variable				
		GTSE	SGGS	ELCM	nAch	RTBS
Level 1 vs. Level 3	Contrast Estimate	-.196	.040	-.142	-.301	-.046
	Hypothesized Value	0	0	0	0	0
	Difference (Estimate - Hypothesized)	-.196	.040	-.142	-.301	-.046
	Std. Error	.043	.056	.045	.074	.079
	Sig.	.000	.478	.001	.000	.558
	95% Confidence Interval for Difference					
	Lower Bound	-.281	-.070	-.230	-.446	-.201
Upper Bound	-.111	.149	-.055	-.156	.109	
Level 2 vs. Level 3	Contrast Estimate	-.130	-.037	-.071	-.239	-.143
	Hypothesized Value	0	0	0	0	0
	Difference (Estimate - Hypothesized)	-.130	-.037	-.071	-.239	-.143
	Std. Error	.042	.053	.043	.071	.076
	Sig.	.002	.484	.098	.001	.059
	95% Confidence Interval for Difference					
	Lower Bound	-.212	-.142	-.155	-.378	-.291
Upper Bound	-.049	.068	.013	-.101	.005	

Note: Level 1 (*Low*), level 2 (*Moderate*), and Level 3 (*High*). Reference category = 3

Source: Survey data, 2016

The *K*-matrix results in Table 18 illustrate a practical approach to combining various factors in entrepreneurship decision-making, where self-efficacy and technology integration competencies were important variables in students' entrepreneurial initiatives.

T-test was used as the post-hoc test for *sH3*, which showed statistically significant differences between mean scores on Levels 1 and 3 for self-efficacy ($t = -.196, p = .001, SE = .04, [-.281, -.111]$); economic locus of control ($t = -.142, p = .001, SE = .05, [-.230, -.055]$); and need for achievement ($t = -.30, p = .001, SE = .07, [-.446, -.155]$). Also, non-significant statistical differences were reported for cognitive skills development and Entrepreneurship Levels 1 and 3 on goal-setting ($t = .40, p > .05, SE = .06, [-.070, .149]$) and risk-taking behaviour for students ($t = -.14, p > .05, SE = .08, [-.291, .005]$).

In addition, Levels 2 and 3 showed significant outcomes for the GTSE ($t = -.130, p = .002, SE = .04, [-.212, -.049]$) and nAch ($t = -.239, p = .001, [-.378, -.101]$) on entrepreneurship propensity categorisation. On the contrary, non-significant results were recorded for business students' mean values on Entrepreneurship Level 2 and Level 3 for SGGS ($t = -.037, p = .484, SE = .05, [-.142, .068]$); ELCM ($t = -.071, p = .098, SE = .04, [-.378, .101]$); RTBS ($t = -.143, p = .059, SE = .07, [-.291, .005]$).

Practically, students' mental traits scores were different in entrepreneurship skills development for *low* (Level 1), *moderate* (Level 2), and *highly* developed (Level 3) entrepreneurship students in this study. Thus, the *sH4* results in this study imply that students' cognitive behaviours do not vary for low awareness vs. highly interested entrepreneurial candidates on goal-setting, risk, and risk-taking and between moderate vs. high entrepreneurship awareness groups on goal-setting, economic locus of control, and risky behaviours. Therefore, *sH4* has successfully discriminated between different

levels of student entrepreneurship groupings in this study. Notably, the findings reported under *sH4* have the potential for cognitive development and behavioural modifications in employee training and entrepreneurship education by counsellors in the Ghanaian context.

4.1.7 Hypothesis 2 Results: Personal Traits and SEPM Factor

The relationships between individuals' characteristics and entrepreneurship development have been documented in other cultures (e.g. Geldhof et al., 2014). Understanding what influences students' attributes on entrepreneurship propensity has ignited interest in this study with 709 survey data. Hypothesis 2 attempts to establish a link between students' gender, birth order, and type of parenting style experienced. However, only 220 cases met the acceptable criteria for the hierarchical loglinear model that tests if the sample data reflects the expected frequencies of cases necessary to classify the selected demographic factors. The model scrutinizes the sample data for the combination of demographic factors that meet a stated criterion and produces cell counts and residuals for detailed examination (Field, 2009). In addition, the loglinear model uses Likelihood and Pearson's chi-square tests to establish the significance of the observed frequencies and expected frequencies from the survey data (Healey, 2009). The crust of fitting the survey data with a loglinear model enables the study to examine whether, in combination, the respondents in this study who indicated their birth order, parenting style, sex, and entrepreneurship propensity levels exist in the population. The presence of such combinations has implications for forecasting and planning for entrepreneurship intentions as well as career choices for students in schools.

Therefore, cell counts and residual data are captured in Appendix I (3), with 52% (n = 23) of females reporting suffering from authoritative parentage compared to

their male counterparts (48%) with entrepreneurship categories and birth order. Similarly, the model captured 40% (n = 87) of students at the 'low awareness' stage of entrepreneurship propensity and experienced authoritative parenting according to their birth order, with 46% (n = 108) 'moderately' engaged in entrepreneurship propensity. Interestingly, the loglinear model captured 14% (n = 31) of students who 'highly' engaged in entrepreneurship thinking in this interaction effect. Finally, the model also accounted for birth order, with 69% (n = 105) of students whose birth order fell between first and last (middle) born and 29% (n = 63) being firstborn, with only 2% (n = 5) last born also accounted for by the model.

Based on the observed and expected counts generated by the model, this study tested the null hypothesis that the observed interactions of the three personal traits (gender, birth order, and parenting style) had a non-significant association with students' entrepreneurship propensity category in this study. The goodness-of-fit tests accompanying the model's count and residuals for Hypothesis 2 also comprised the Likelihood ratio and Pearson's chi-square tests. Based on the relatively large sample size of 220, Appendix I (4) shows that, indeed, the observed frequencies of personal trait combinations significantly ($\chi^2(0) = 0, p < .05$) reflected the expected projections by the loglinear test using a saturated model. The chi-square statistics from the saturated model showed a perfect relationship between the observed and expected frequencies in Appendix I (3). Thus, the model's estimations were accurate predictions from the survey data. Therefore, the study rejected the H_02 that students' traits (PTs) and entrepreneurship propensity category were non-significantly related; hence, the conclusion that observed frequencies of PTs and SEPM grouping interaction effects from the survey data for this study truly reflected the population of final year students from the Ghanaian public universities.

4.1.8 Post-Hoc Test for Hypothesis 2

In a follow-up investigation on the significant Pearson's chi-square test on H_02 , a Higher-Order Effect (Table 19) was generated to show that removing the one-way ($K = 2$) effects (i.e. SEPM group \times gender, and birth order \times authoritative parenting) combination effects' was most important ($\chi^2(35) = 46.58, p < .05$) to the overall model in this study.

Table 19 : K-Way and Higher-Order Effects

	K	df	Likelihood Ratio		Pearson		Number of Iterations
			Chi-Square	Sig.	Chi-Square	Sig.	
	1	35	353.126	.000	453.855	.000	0
K-way and Higher Order Effects ^a	2	29	42.128	.055	46.578	.021	2
	3	16	8.237	.941	6.980	.974	4
	4	4	1.421	.841	1.105	.893	3
	1	6	310.998	.000	407.277	.000	0
K-way Effects ^b	2	13	33.891	.001	39.598	.000	0
	3	12	6.816	.869	5.875	.922	0
	4	4	1.421	.841	1.105	.893	0

df used for these tests have NOT been adjusted for structural or sampling zeros. Tests using these *df* may be conservative.

a. Tests that K-way and higher order effects are zero.

b. Tests that K-way effect are zero.

Source: Survey data, 2016)

$N = 220$

Since the model uses hierarchical and saturated approaches in predicting the combinations in Hypothesis 2, achieving iteration at $K = 2$ is highly significant for predicting the groupings in this study. Therefore, removing the highest order ($K = 4$) effect ($\chi^2(4) = 1.12, p > .05$) and $K = 3$ ($\chi^2(16) = 6.98, p > .05$) were not significant predictors of the model fitted to the survey data on PTs and SEPM groupings for the survey; hence, $K = 3$ and $K = 4$ were of no consequence to this study.

Though the model achieved maximum interaction at $K = 2$, there was the need to explore which combinations of the categorical variables were contributing to the

higher-order effects in this study. It is refreshing to note that multivariate statistical models such as loglinear analysis that discriminates between categorical variables only produce omnibus tests based on significance levels (Field, 2009). However, researchers are advised to follow up such omnibus results with either planned or contrast post-hoc tests (Jackson, 2009; Gall, Gall, & Borg, 2010). Hence, the study used partial (χ^2) associations with corresponding p -values for each two-way interaction and the main effects for the four grouping variables to predict the associations in Hypothesis 2.

Table 20 reveals that gender and birth order ($\chi^2 (2) = 6.89, p < .05$) and gender plus parenting style ($\chi^2 (1) = 9.56, p < .05$) were significant combinations in predicting the SEPM factor in this study. The post-hoc results here confirm higher-order effects removal in Table 19, which shows that omitting specific interactions was more likely to bias the model. Thus, the one-way ($K = 1$) and the two-way ($K = 2$) interaction effects were recipes likely to invalidate the model fitted to Hypothesis 2.

Table 20 : Partial Associations for K 2-Way Interactions for Hypothesis 2

S/N	Effect	<i>df</i>	Partial χ^2	Sig.	Number of Iterations
1	SEPM Group \times Gender \times Birth Order	4	2.959	.565	3
2	SEPM Group \times Gender \times Parenting Style	2	3.133	.209	3
3	SEPM Group Birth Order \times Parenting Style	4	.183	.996	3
4	Gender \times Birth Order \times Parenting Style	2	.614	.736	3
5	SEPM Group \times Gender	2	1.685	.431	3
6	SEPM Group \times Birth Order	4	3.993	.407	3
7	Gender \times Birth Order	2	6.894	.032	3
8	SEPM Group \times Parenting Style	2	2.171	.338	3
9	Gender \times Parenting Style	1	9.559	.002	3
10	Birth Order \times Parenting Style	2	3.660	.160	3
11	SEPM Group	2	43.663	.000	2
12	Gender	1	9.690	.002	2

13	Birth Order	2	175.582	.000	2
14	Parenting Style	1	82.063	.000	2

Source: Survey data, 2016

N = 220

In other words, Pearson's χ^2 test derived for Hypothesis 2 was non-significant if the $K = 2$ interactions were eliminated. In tangible terms, gender birth order and parenting styles were closely linked to entrepreneurship skills in the model.

Likewise, Table 20 shows that eliminating the $K = 1$ variables of students' entrepreneurship propensity group ($\chi^2(2) = 43.66, p < .05$); gender ($\chi^2(1) = 9.69, p < .05$); birth order ($\chi^2(2) = 175.58, p = .05$); and authoritative parenting style ($\chi^2(1) = 82.06, p < .05$) were statistically significant in support of the *K-Way and Higher-Order Effects* post-hoc results in Table 19. In conclusion, the loglinear model was an excellent fit for explaining the interaction effects witnessed between the four categorical variables (sex, parenting, birth order, and entrepreneurship level) in Hypothesis 2.

In conclusion, the results of Hypothesis 2 have significant support for career developers' (Patton & McMahon, 2014) view that demographics are essential variables in the traits approach to matching individuals to work. Similarly, Strods (2013, p. 62) reiterated the role guidance plays in career choice decision-making for individuals throughout their lives. Indeed, significant others (Chisholm & Hurrelmann, 1995; Kraus, 1998) have also entertained the fear that present career trajectories young people and unqualified workers tend to follow are highly unpredictable, making integrating young people into the labour market even more problematic. Such views contextualise the current statistical findings in Hypothesis 2 with a call on career developers to intensify individual and group counselling practices for abused children whilst recognising gender differences in entrepreneurship skills acquisition for the youth in and out of school.

4.1.9 Hypothesis 3 Results: Institutional and SEPM Factors

Using descriptive statistics in their GUESSS Report, strong evidence emerged between students attending workshops and networking with existing entrepreneurs and innovation-driven lectures among university students (Fueglistaller & Zellweger, 2011). Consequently, the current study sought to extend knowledge by testing the influence of three institutional conditions (students' leadership roles, club activities, and entrepreneurship seminars attended) on entrepreneurship propensity levels. Hypothesis 3 (H_{o3}) sought to establish an independent relationship between institutional factors and students' entrepreneurship intentions using the hierarchical loglinear analysis model in IBM SPSS Statistics Version 23. Curiously, the three variables interactions witnessed 17% ($n = 39$) decrease compared with the four categorical variables explaining Hypothesis 2 ($N = 220$; see Appendix I (3)). The following narratives present the observed frequencies for the combined factors explaining institutional and entrepreneurship intention development levels amongst business students from the three Ghanaian public universities. In effect, only 181 observed cases meet the 3 x 3 contingency criteria for H_{o3} out of 709 total samples in this study. An indication of entrepreneurship traits development reserved for a selected few in a population is shown in the 181 samples in the loglinear model. Figure 13 shows the frequency of students' leadership roles and entrepreneurship thinking.

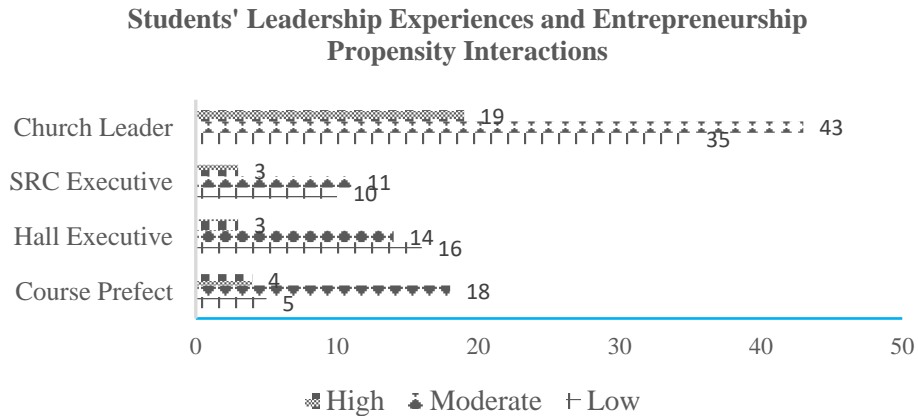


Figure 15: Entrepreneurship seminars and SEPM Source: Survey data, 2016

The bar graph represents the frequencies of the three categorical variables predicting H_{o3} . Church leadership roles represented 54% ($n = 97$) of the extra-curricular activities of respondents, and course prefects and students representative council (SRC) leaderships on almost even keel (15% and 13% respectively). Meanwhile, 16% ($n = 29$) of the observed frequency of student leaders constituted the SEPM group ‘high’, with the majority ($n = 86$) falling into the ‘moderate SEPM group. The frequency of students who stated they often engaged in entrepreneurship thinking seems to be even across SRC, hall executives, and course prefects’ positions in this study. The church leadership role leads (54%) entrepreneurship propensity internship.

The observed frequencies for the second interaction variables predicting H_{o3} are in Figure 14. Regarding the number of entrepreneurship seminars attended whilst in school, 53% ($n = 96$) of students reported 1 to 3 times attendance, with 14% ($n = 25$) indicating 7 times and above as of their final year in the university.

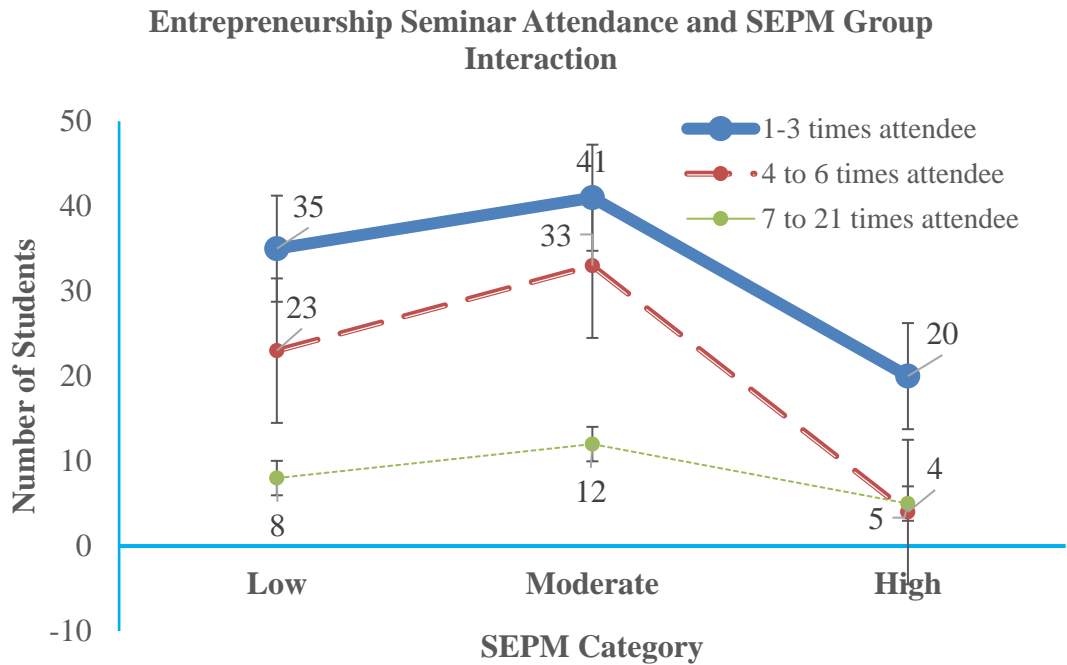


Figure 16 : Entrepreneurship propensity and seminar interaction

Source: Survey data, 2016

Secondly, despite 36% ($n = 66$) attending entrepreneurship seminars, they rarely engaged in entrepreneurship activities, with 16% ($n = 29$) reporting in the affirmative whilst in the university (*High group*). Such findings provided the basis for using robust statistical models to account for personal traits (H_02) and cognitive constructs (H_01) role in predicting entrepreneurship propensity amongst college students in Ghana.

The projections in Figure 14 showed that the number of entrepreneurship seminars attended did not reflect the students' propensity to 'often' think how to be entrepreneurs; between 4 to 6 times seminar attendees, 93% ($n = 56$) were in *low* and *moderate* categorisations of entrepreneurship propensity. As more students attended entrepreneurship seminars in the *moderate* and *low* groups, their scores on entrepreneurship decreased, alluding to the assumption that entrepreneurship education does not necessarily ignite innovative thinking and creativity in disequilibrium situations that promote entrepreneurship intent. Thus, fewer students who score high on entrepreneurship traits tend to attend fewer seminars.

Based on the narratives generated from the institutional factors interacting with entrepreneurship propensity groupings, the study tested H_{o3} using the saturated method of hierarchical loglinear analysis model. Appendix I (2) also significantly explains the observed scores and the expected frequency with Pearson's goodness-of-fit statistics ($\chi^2(0) = 0, p < .05$) as witnessed in H_{o2} testing. The Pearson χ^2 established an interaction effect between entrepreneurship propensity group, leadership roles, and entrepreneurship seminar attendees in this study. The study rejected the null hypothesis that students' entrepreneurship development has no relationship with opportunities provided within the school context.



Table 21 :K-Way and Higher-Order Effects of SEPM and Institutional Factors

	K	df	Likelihood		Pearson		Number of Iterations
			Ratio		Chi-Square		
			Chi-Square	Sig.	Chi-Square	Sig.	
	1	143	516.177	.000	955.884	.000	0
K-way and Higher Order Effects ^a	2	133	136.379	.403	214.305	.000	2
	3	96	86.604	.743	86.043	.757	4
	4	36	13.571	1.000	10.658	1.000	6
	1	10	379.798	.000	741.579	.000	0
K-way Effects ^b	2	37	49.775	.078	128.262	.000	0
	3	60	73.033	.120	75.385	.087	0
	4	36	13.571	1.000	10.658	1.000	0

Source: Survey data, 2016 (N = 181)

Notes: *df* used for these tests have *NOT* been adjusted for structural or sampling zeros. Tests using these *df* may be conservative.

a. Tests that k-way and higher order effects are zero.

b. Tests that k-way effect are zero.

Thus, deleting the 2-way combinations of the factors would have significantly reduced how well the model fits the survey data for H_03 . Even though the one-way interaction effect of SEPM propensity group, leadership roles, club activities, and number of entrepreneurship seminars attended significantly ($\chi^2(53) = 1104.64, p < .001$) predicted the loglinear model, the two-way interaction effect was the best predictor of the observed and expected frequencies for explaining the relationship between institutional factors and entrepreneurship propensity categorisation.

However, the 4-way interactions were non-significant ($\chi^2(36) = 10.66, p > .05$) in this study (Table 17). Specifically, Table 17 identifies which group combinations account

for the specific hierarchical *Pearson's* chi-square witnessed in Table 22 using the *Partial Associations* table with *p*-values and iteration frequencies.

Table 22 : Partial Associations for Institutional Factors in Hypothesis 3

Effect	df	Partial Chi-Square	Sig.	Number of Iterations
Leadership role x club activities x SEPM group	18	12.152	.839	5
Leadership role x club activities x entrepreneurship seminar	18	19.728	.348	4
Leadership role x SEPM group x entrepreneurship seminar	12	33.253	.001	4
Club activities x SEPM group x entrepreneurship seminar	12	15.503	.215	5
Leadership role x club activities	9	17.611	.040	3
Leadership role x SEPM group	6	8.252	.220	3
Club activities x SEPM group	6	6.641	.355	3
Leadership role x entrepreneurship seminar	6	3.809	.703	3
Club activities x entrepreneurship seminar	6	5.600	.469	3
SEPM group x entrepreneurship seminar	4	7.638	.106	3
Leadership role	3	68.768	.000	2
Club activities	3	236.241	.000	2
SEPM group	2	30.327	.000	2
Entrepreneurship seminar	2	44.462	.000	2

Source: Survey data, 2016 N = 181

Confirming the significant 2-way interaction effects, the model aptly shows that the *leadership roles* and *entrepreneurship seminar attendance* significantly ($\chi^2(12) = 33.25, p < .05$) explained the model better than any other combinations followed by *leadership role and club activities* ($\chi^2(9) = 17.61, p < .05$). Similarly, the four categorical variables were all singularly and significantly good predictors of SEPM groupings in this study; specifically, leadership roles ($\chi^2(3) = 68.78, p < .05$), club

activities ($\chi^2 (3) = 236.24, p < .05$), and entrepreneurship seminars attended ($\chi^2 (2) = 44.46, p < .05$).

On the other hand, Table 16 shows that the $K = 1$ way interactions are also statistically significant ($\chi^2 (143) = 955.88, p = .001$). The partial association table confirmed that indeed, students' leadership roles ($\chi^2 (3) = 68.79, p = .001$), SEPM Propensity Group ($\chi^2 (2) = 30.33, p = .001$), club membership activities ($\chi^2 (3) = 236.24, p = .001$), and entrepreneurship seminars attended ($\chi^2 (2) = 44.46, p = .001$) were statistically significant in the model. Hence, omitting any of them could have consequences for predicting the existence of the three factors in combination with the study population. Finally, the implications for the significant results for H_{o3} in this study amplify the view that, indeed, developing entrepreneurship propensity is significantly linked with the institutional programmes that build soft skills such as organising, team spirit, conscientiousness (ability to be organised, accountable, and assiduous), and critical thinking. The findings on institutional factors probably have essential application for guidance and counselling coordinators in Ghanaian public universities. Above all, the study posits that statistically, the combinations of institutional and SEPM propensity factors are not biased by sampling error or chance, and within 95% CI, a saturated model ($\chi^2 (0) = 0, p = 1$) of this magnitude could not have occurred by chance alone in the population of Ghanaian business graduates.

4.1.10 Hypothesis 4 Results: Gender with Technology and Cognition

Hypothesis 4 (H_{o4}) further examines Research Objective 1 (RO1) on gender dimensions of *Factor 2* (stages of technology adoption -STA), *Factor 3* (general task self-efficacy - GTSE), and *Factor 4* (students' grit goal-setting - SGGS) as identified in Section 3.5. Before H_{o4} testing, the study examined some useful parameters required

for the stepwise (Forward LR) logistic regression model's ability to significantly account for the observed scores from the 2016 survey data (see Section 3.9). Therefore, this segment presents the overall model's prediction of the outcome factor and diagnostic statistics highlighting the model's overall-fit ('goodness of fit' test), including the -2LL and associated χ^2 statistics of H_{o4} in this study.

Field (2009) believes logistic regression is a rarely applied social sciences model, leaving no standardised reporting procedures. Similarly, statistical reporting procedures by APA are also silent on reporting logistic regression except on simple and multiple regressions (APA, 2010, pp. 144-145). However, from the heuristic, Field prescribes that researchers furnish their readers with the *EXP (B)*, *CI*, χ^2 test, R^2 , constant values, and significant and non-significant predictors in the model information to help them make informed decisions on the model-fit. The current study draws on Field's recommendations and the adoption of the APA's directions on reporting metric (continuous scale) regressions since logistic regression shares some attributes with the GLM models. For instance, attributes such as CI, beta-weights, and change statistics are also common to probity logistics. Therefore, with 670 valid cases from the survey data for this study, Table 23 shows the results of the coefficient of determination (pseudo R^2) of the Wald Statistics for testing H_{o4} for the logistic regression model.

Table 23: Logistic Regression Results for Hypothesis 4: Model Summary for H_{o4}

	-2 Log likelihood	Cox & Snell R^2	Nagelkerke R^2
1	862.889 ^a	.023	.032

Footnote: a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001; Model $\chi^2(1) = 15.86, p = .001$, SGSS ($p < .05$).

Based on the χ^2 statistics (Wald's test), all but *Factor 4* (goal-setting) was

statistically significant ($\chi^2 (1) = 15.86, p < .05$) predictor of gender in the current study (see Footnote to Table 23. Statistically, the model significantly explained between 2.3% (Cox & Snell's $R^2 = .03$) and 3.2% (Nagelkerke $R^2 = .032$) in the outcome factor (gender). Hence, the study rejects the null hypothesis that students' stages of technology adoption, general task self-efficacy, and grit goal-setting predictors would non-significantly differentiate gender. Duly, the findings in Table 23 conclude that statistically significant differences exist between gender and the three predictors (stages of technology adoption, self-efficacy, and goal-setting) in this study. As a characteristic of omnibus statistical tests involving multi-variates, individual predictors' contribution to the significant results in Table 23 has to be investigated in a post-hoc analysis for H_04 (Section 4.1.11).

4.1.11 Post-Hoc Tests for Hypothesis 4

As recommended by statisticians, a significant omnibus test justifiably requires a discriminant test (Tabachnick & Fidell, 2013). Hence, the results of H_04 required further examination of the 'goodness of fit' of the logistic regression model applied to the survey data. The post-hoc test on the model sought to examine significant variables included or omitted in the equation, the classification of the cases, and the residual values. Primarily, Table 24 produces the log-likelihood (log LR) ratio statistics for only *Factor 4*, significantly predicting this study's model. The Log Ratio (LR) reveals that the removal of *Factor 4* would have had a significant (Log-LR (1) = 15.86, $p < .05$) impact on the model's predictive power in this study.

Table 24 : Model If Term Removed Effect on the Model

Variable	Model Log Likelihood (LL)	Change in -2LL	df	Sig. of the Change
Step 1 SGGS	-439.376	15.862	1	.000

Source: Survey data, 2016

n = 670

Therefore, only *Factor 4* explained the model in *Ho4 significantly*. Thus, the probability of accounting for the gender variable without *Factor 4* was 0.1% ($p = .001$), a chance that the model would have been a useful estimator of the survey data to test *Ho4* in this study - such a slim margin of error observed. In orders, out of one-hundredth time, holding all variables constant, the only chance that the goal-setting factor would not differ for male and female students in similar conditions will be 1 out of 100 for business students in the seven public universities (population) (Table 1).

Instructively, interactive effects for *Factors 2 and -4* were non-significant ($\chi^2(1) = .27, p > .05$) in this study (see Table 25). Similarly, *Factor 2* ($\chi^2(1) = .33, p > .05$) and *Factor 3* ($\chi^2(1) = .07, p > .05$) had no significant predictive powers in the logistic regression model fitted to the sample data from the field as predictors of gender categorisation in this study. Therefore, the study concludes that there are no statistically significant differences in discriminant coefficient values for self-efficacy, stages of technology adoption, and gender variables in this study. Since the coefficient scores obtained were not different from 0, they were removed for subsequent model determinations.

Table 25 : Coefficient for Variables not in the Equation for Hypothesis 4

			χ^2 Score	df	Sig.
Step 1	Variables	<i>Factor 2</i> (STAS)	.328	1	.567
		<i>Factor 3</i> (GTSE)	.069	1	.793
		<i>Factor 4</i> (SGGS) <i>x</i> GTSE <i>x</i> STAS	.268	1	.605
Overall Statistics			.528	3	.913

Source: Survey data, 2016

n = 670

However, Table 25 fails to tell the entire story of predictors in the model. Thus, one factor was not accounted for by the *Variables Not in the Equation table* (Table 25). Therefore, the model produced another computation to explain the missing factor's role in accounting for the survey data to test H_{o4} in this study (as in Table 26). Indeed, the odd ratio is an essential element in explaining the outcome factor using the logistic regression model in this study. The odds ratio ($Exp(B)$) for grit goal-setting in females was .51 times less than that of male students in the population of final-year business students from Ghanaian public universities.

Table 26: χ^2 and β Statistics for *Factor 4* as Variable in the Equation

								95% CI. for	
								EXP(B)	
		<i>B</i>	<i>S.E.</i>	Wald	<i>df</i>	<i>Sig.</i>	<i>Exp(B)</i>	Lower	Upper
Step 1 ^a	SGGS	-.673	.172	15.272	1	.000	.510	.364	.715
	Constant	1.617	.559	8.375	1	.004	5.040		

a. Variable(s) entered on step 1: SGGS. n = 670 Source: Survey data, 2016

The population value of $Exp(B)$ lies between .36 and .72 of 95% CI with an odd ratio of .51 (EXP(B)). thus, the chance that goal-setting had predicted gender categorisation was statistically significant ($\chi^2(1) = 15.27, p < .05$) in the current study.

The survey data used for *H₀₄* were great predictors of the *CI* in this study. The *CI* should be between 0 and 1 (*probit*) and values greater than one attempt to account for a situation when the predictor (s) increase (s), the dependent factor also increases and the opposite for the *CI* within the *probit* range (0 and 1) (Pallant, 2005). The .51 *CI* obtained from the sample data in this study offers confidence in the direction of the only significant predictor (SGGS) of gender. As SGGS scores increase, the odds ratio (*EXP (B)*) for male students also tangentially decrease in favour of their female counterparts in this study. So, the probability that male students always lead their females in goal-setting could be managed with training activities to achieve parity as per the model in this dissertation. In other words, it is not a foregone conclusion; the situation is beyond reach for girls since the *C.I.* is within acceptable limits of 0 and 1 for this study.

Simply put, the predictor did not increase the odds of being a male-dominated activity. However, Table 27 shows that 97% (n = 413) of goal-setting tasks were ascribed to males, with only 7% (n = 227) females correctly classified by the model. Table 27 was based on the model's only significant predictor (SGGS), excluding the constant (*b₀*).

Graphically, the majority of the scores seem tilted to the left, which also indicates group membership prediction. In conclusion, goal-setting initiatives can assist female students in becoming future-oriented. Overall, the model successfully explains 64% of *Factor 4* with gender, leaving residuals of 36% unexplained (see Table 27 overleaf).

Hosmer and Lemeshow Test is the most reliable test of model-fit in the IBM-SPSS statistical package, which needs to produce a p-value greater than .05 (Pallant, 2005, p. 167; Field, 2009). The results of the Hosmer and Lemeshow Test as 'goodness of fit' results (Appendix M) also significantly ($\chi^2(1) = 12.435, p > .05$) supported the

logistic regression model's ability to predict the outcome variable in Ho4s. Consequently, the current study's confidence in using goal-setting as a predictor of Ghanaian business students' gender categorisation is consistent with the logistic regression model.

Table 27 : Classification Table for the Outcome Factor

		Observed	Predicted		
			Male	Female	Percentage Correct
Step 1	Gender	Male	413	13	96.90
		Female	227	17	7.00
		Overall Percentage			64.2

a. The cut value is .500, n = 670. Source: Survey data, 2016

Indeed, the significant difference between males and females on goal setting could offer insightful thought for counsellors inclined towards psychotherapy practices that focus on Adlerian child-rearing and gender implications. Particularly, the girl-child education curriculum benefits from exploring the findings in *Ho4* in relationship with Ghanaian cultural practices that sometimes assign girls to domestic chores instead of helping them aspire for careers in industry. Similarly, career development experts could also interrogate this section's findings.

4.1.12 Supplementary Findings 5: Gender and Technology

Using students' stages of technology adoption factor (STA) as a *regressor* in the logistic regression model in Hypothesis 4 (*Ho4*), emergent findings were made, and a supplementary hypothesis was formulated and tested. Table 20 reveals that the *STA Factor* was statistically non-significant ($\chi^2(1) = .328, p > .05$) in predicting gender in

this study. Conventionally, statisticians (Field, 2009; Howell, 2010) often do not encourage the conduct of post-hoc analysis for non-significant hypotheses beyond omnibus tests, especially in ANOVAs.

Indeed, various technology labels are used to describe today's learners. Thompson (2005) calls them the "Wi-Fi Generation". Others call them "Digital Learners" (Shelly et al., 2006). However, the quantification literature has always put the male gender ahead of the females in technology proficiencies (e.g., Yidana, 2007). With a close digital gap in the current study, perhaps curious stories could be told about what stages of technology adoption Ghanaian business graduates are leaving public universities within the knowledge society with implications for career development. Therefore, the study hypothesised in *Supplementary Hypothesis 5* (sH_05) that technology integration scores from the 709 samples would not significantly differ from the population of business students in Ghanaian public universities. However, this segment implies the alternate hypothesis for *Supplementary Alternate Hypothesis 5* (sH_{A5}).

The study sought to generalise the samples' views on STA to the entire population of business students. Hence, the one-sample t-test was used for sH_{A5} under *Hypothesis 4*. With its predictive power (Howitt & Cramer, 2011), the one-sample t-test helped to relate the sample statistics to the population in this study. Before the sH_04 (Section 4.1.11) test, Table 28 (overleaf) shows descriptive statistics of students' concern-based adoption (CBAM) levels based on Hall and Hord's (1987) three stages of concerns. The results showed that the *impact-concerns* users dominated 56% ($n = 375$) compared with 36% ($n = 238$) of the *task-concern* category and *self-concern* groups (9%) of technology users. The data also indicated a 6% ($n = 39$) marginal missing data from the original 709 samples in sH_05 computation (see Table 28).

Table 28 : CBAM of Technology Integration into Business Curriculum

Academic Department							
DoI Label	Human Resource		Health			Total	% Total
	Accounting	Management	Marketing	Administration	Management		
Self- concerns	31	18	3	3	2	57	8.51
Task- concerns	148	22	8	18	42	238	35.52
Impact- concerns	248	46	16	34	31	375	55.97
Total	427	86	27	55	75	670	100
% Total	63.73	12.84	4.03	8.21	11.19	100	

Leven's Test for Equality of Variances ($F(668) = 3.10, p = .079$) for gender

Source: Survey data, 2016.

Besides an equality of variance test, a necessary condition for a one-sample t-test was tenable ($F(688) = 3.10, p > .05$) in this study (see footnote to Table 28). Hence, to test the hypothetical statement that students who participated in the current study's views on technology adoption would not differ from the entire population of business students in Ghanaian public universities.

Table 29 (overleaf) displays the results of the one-sample t-test with the population *CI* between 4.4 (lower) and 4.6 (upper). Thus, on a scale between 1 (awareness) and 6 (creative application of ICTs into new context), the population's overall mean score of 4 attested to the classification of familiarity and confidence in technology integration into the business curriculum in general. In one sample t-test, a value of 0 simply seeks to assume that the sample statistics (*SD*) are not different from the population *SD* scores (Field, 2009). Instructively, the study found a slight difference between the sample data and the population mean ($M = 4.53$) with *CI* of 4.42 and 4.63.

Table 29 : One-Sample t-Test for Students' Technology Adoption

Factor	Test Value = 0					
	<i>t</i>	<i>df</i>	Sig. (2-tailed)	Mean Diff.	95% CI of the Diff.	
					Lower	Upper
Students' Stages of Technology Adoption for Business Education Curriculum	85.932	669	0.001	4.525	4.42	4.63

Source: Survey data, 2016; Notes: N = 670, Mean = 4.53, *SD* = 1.36. SE (.53)

Huck (2012) points out that a sample size of 30 and above is ideal for the one-sample inferential test (either z-test or t-test), with large samples likely to yield smaller deviations from their mean. Hence, 709 samples in the current study produced such deviation from the population mean by 0.105 (*CI*: upper and lower boundaries). The study finds a statistically significant difference ($t(669) = 85.93, p < .05$) exists between the sample mean and the population mean on students' stages of technology adoption. The positive *t*-value (85.93) implies that the sample proportion was greater than 0.

Hence, the evidence based on the *p*-value was insufficient to conclude that the percentage of business students' scores on stages of technology adoption in the population was significantly different from 0. The study rejected the *sH₀* and adopted the *sH_A*, which is the perception of students on familiarity and confidence in technology integration into a business curriculum that holds for the population as well. Consequently, findings of Supplementary Hypothesis 5 dovetailed into Azevedo's (1999) belief that career development for the knowledge society faces constant evolution, chaotic, and disorderliness spearheaded by technological innovations. Given technological challenges and demographics altering career choices today, Silverstone (2007) also offered business educators a broader variety of technologies for online teaching, the "Wi-Fi Generation", including chat tools provided in a text-based format

and Voice over Internet Protocol (VoIP). Finally, career guidance experts can apply findings in Hypotheses 4 for business education curriculum that accounts for the career development needs of entrepreneurial-minded students learning in universities.

4.1.13 Summary of Research Question 1

Crafted in objectivists' rhetoric, Research Question 1 predicted variance errors in business students' entrepreneurial development stages using five cognitive variates, technology integration competency as a covariate, personal traits, and institutional factors. This study's exploratory factor analysis helped identify strong variables by measuring the seven latent variables during the pilot study stage with 54 samples. The retained items averagely scored Cronbach's α of .9 based on average KMO statistics (Kaiser, 1974) of .78 for the final questionnaire to collect data from 709 graduating business students from three Ghanaian public universities using randomisation.

Based on extensive data exploration techniques (Section 3.9) employed for multivariate and univariate statistical models in the current study, four main hypotheses were formulated in response to Research Question 1. Consequently, one-way MANCOVA was used to answer Hypothesis 1 with MDA for Hypotheses 2 to 4. Specifically, loglinear analysis supported Hypotheses 2 and 3, whilst hierarchical logistic regression categorised male and female students on self-efficacy, goal-setting, and stages of technology adaptation in this thesis. Statistically significant supports were recorded for the four hypotheses. The main model accounted for η^2_p of .852 in this study. Similarly, the discriminant tools successfully distinguished between stages of entrepreneurship development and gender traits. Multivariate statistics in this study accounted for several supplementary hypotheses and findings in both the methodology and results chapters, which were duly reported.

The study supported the thesis statement that based on the current economic

transition trends, which are dominantly knowledge-based, graduates from Ghanaian public universities' employability would be significantly boosted with the development of socio-cognitive, technology integration, and entrepreneurial intention. Government, civil society organisations, employing organisations, and academic institutions could consider implications for the findings reported in the present study. Policy formulation and evaluation, curriculum issues, job design, organisational development, and strategic human resources management could specifically apply the current findings. Similarly, guidance and counselling practitioners in Ghanaian basic, secondary, and tertiary institutions interested in career choices can apply the findings to students' guidance and counselling curriculum.

4.2.0 Results of Research Question 2

This segment employs a host of interpretivism approaches, such as thick critical and experiential descriptions, multiple realities construction, emphasising personal experiences, concept mapping, member checking, and iterative synthesis (Given, 2008; Stake, 2010; Creswell & Clark, 2011) to examine students' lived experiences about their curriculum and Indigenous knowledges in the Ghanaian environment. For instance, Stake (2010) advises that qualitative findings should be emergent, and researchers should avoid the priori approach characterising quantitative research procedures. Johnson and Christensen (2008) add that qualitative data analysis fundamentally entails the interpretation of text from interview or field note transcriptions, immersing oneself in the data to understand the nuances, and enumerating word categories for relationships and diagrammatic representations of the emergent findings.

Hence, the current study used participatory rural appraisal (PRA) by Chambers (1994) to interview 11 final-year students from bachelor of business administration

departments in a Ghanaian public university that generated group narratives to explore their views about business curriculum and indigenous Ghanaian businesses for emergent findings following the overarching question in Research Objective 2 (*RO2*). Thus, two broad themes (curriculum and indigenous knowledge systems by Ghanaian companies) were explored from interrelated themes.

Qualitative experts also recommend data analysis from the initial 30 to 50 codes to between five and seven dominant themes that describe the event to eliminate redundancies in subsequent analyses (Creswell, 2012). Clarifying the complexity of data collection units, Yin (2011) shares the nested technique involving multiple data management levels from a broader field setting to a narrower level. Overall, the FGD data for *RO2* generated 95 themes under the education theme, which was later reduced to three narrow themes (Figure 16), as recommended by Creswell for interpretation and evaluation when *saturation* is attained in the data coding. Saturation depicts a stage where no new information can be added to the emerging themes in qualitative data management (Creswell, 2012; Cohen et al., 2007). Hence, the data presentation in this section applies the principles of saturation, layering, and interrelating themes as I deconstruct the interview narratives from the FGD using frequency counts, percentages, and anecdotes as summative tools. In addition, the *Models* feature in TMNVivo (QSR International Pty Ltd, 2009) was used to create a conceptual model to summarise the main themes explored under *RO2*. Indeed, overarching emergent findings are presented in this chapter on the business education curriculum and students' knowledge of Indigenous business with entrepreneurial thinking.

4.2.1 Education Theme Explored from the FGD Data

The results for *RO2* exploring students' views on their curriculum (education and ICT) used three stages to arrive at three themes that addressed discussants' views on

their business education curriculum. From the matrix-coding table generated in Nvivo (Appendix K), 12 parent codes were generated from 2607 word counts on the education theme and were later recoded with six children nodes (Figure 15). In line with word search analysis was Pacheco et al.'s (2010: 978) work, which similarly used NVivo to categorise institutional theory and institutional economics of entrepreneurship. Whilst the students' opinions on linking theory to practice received the least ($n = 9$) contribution, suggestions for improving the business education curriculum ($n = 1142$) dominated the discussion in this study.

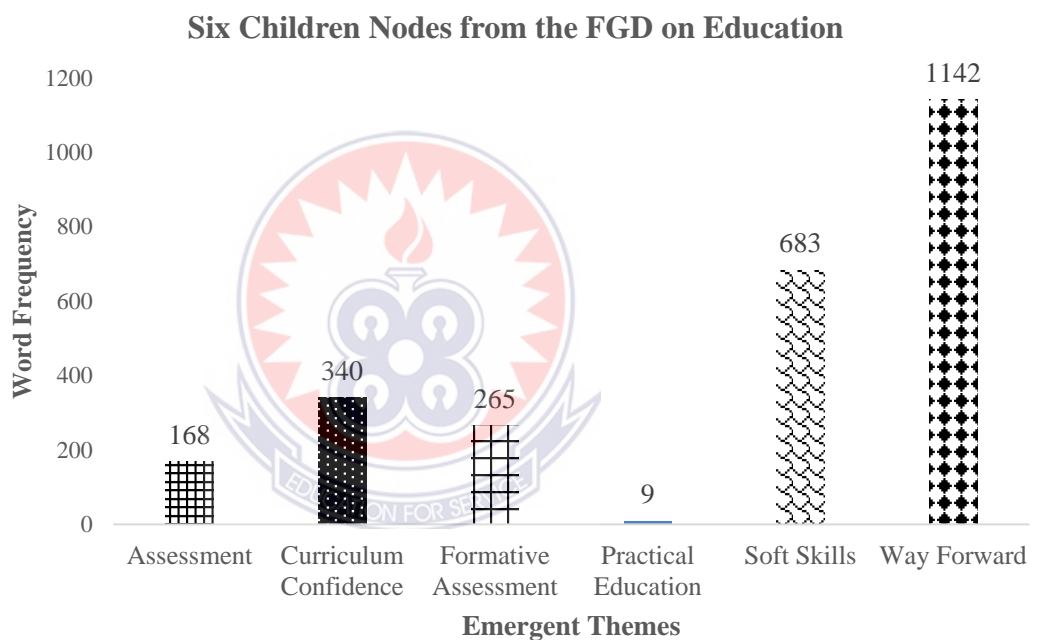


Figure 17 : Child nodes explored with matrix coding in NVivo™

However, the six children nodes in Figure 15 were coded based on similar themes. Children nodes on ‘assessment’, curriculum confidence’, formative assessment’, and ‘practical education’ were further classified under ‘concerns’ for final analysis. The results from word counts and emergent themes on business education curriculum issues showed that students were most concerned about the confidence their curriculum offered ($n = 340$), their participation in curriculum evaluation that informed

teaching and learning (n = 265) and lack of practical training they had whilst in school. The discussants' views on problems about their curriculum were complimented by their gratitude for some soft skills they also believed their university curriculum offered them. Consequently, the study examined the three core issues that dominated the students' word counts on Theme 1, with some cases (discussants) contributing to the discussion.

Figure 16 shows the final coding for three grandchildren nodes (sub-themes) based on how many students offered commentary on the *education theme* (Theme 1).

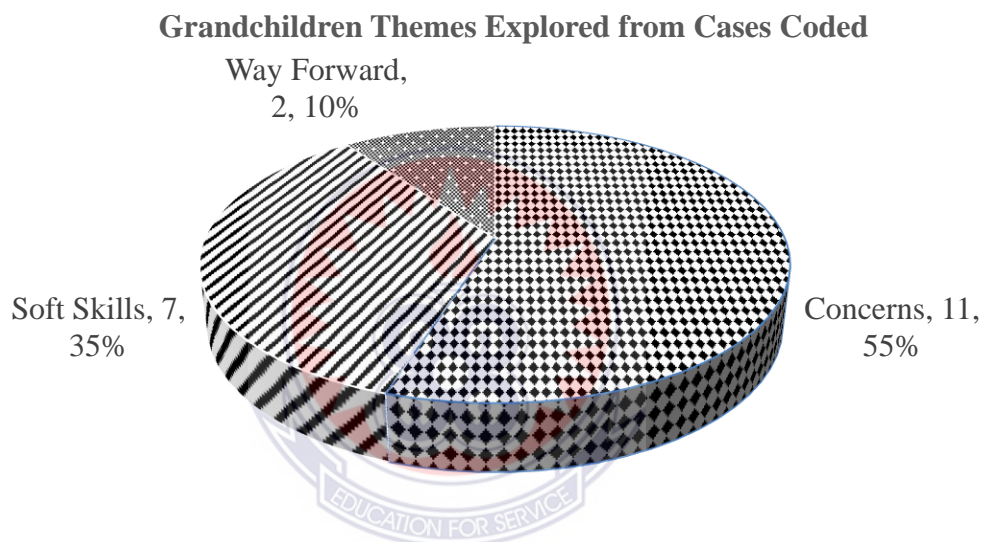


Figure 18: Final themes explored from FGD on education

Overall, 55% (n = 11) of the cases expressed opinions on suggestions for the business educational curriculum, followed by seven commenting on skills acquired, whilst 10% (n = 2) on suggestions. Interestingly, 10% of the cases might contradict the majority (1402) word counts in Figure 15. The percentage of cases recorded was due to the nature of focus group discussion, where member checking was a unique feature for individual comments guided by RPA frameworks in this study. The discussants spoke with a unifying voice on suggestions for improving their business curriculum, hence the reduced percentage of cases. Therefore, the findings of this section are discussed

under three tracts (21st-century skills, concerns, and suggestions) as illustrated in Figure 16.

4.2.2 Business Curriculum and 21st-Century Literacy

This section now explores the themes generated with *multiple perspectives*, and several viewpoints are provided from individuals and group data sources as evidence of the phenomenon (Creswell, 2012: 250). The three emergent themes in this study were presented with anecdotes from the FGD to deconstruct the themes since Creswell recommends that aside from adopting multiple perspectives as relevant tools for projecting the complexity of an event, phenomenon, idea, *contrary evidence* of information to support or confirm the themes or thoughts in a qualitative study.

The background to exploring students' soft skills is drawn from a work sponsored by NCREL and METRI Groups. Taking stock of the academic achievement of learners in the knowledge economy, the North Central Regional Educational Laboratory (NCREL) and the Metiri Group (METIRI) commissioned a 2003 committee report on *Literacy in the Digital Age in America* (NCREL & METRIC, 2003). The sponsored work was in response to action based on the relatively innocuous question '*Are your graduates ready to thrive in today's Digital Age?*' from a publication of the CEO Forum on Education and Technology (2001) that tabulates the *Key Building Blocks for Student Achievement in the 21st Century*'. Amongst others, the Engage Report by the NCREL and METIRI listed inventive thinking, effective communication, digital-age literacy, curiosity, creativity, risk-taking, personal, social and civic responsibility, interactive communication, and multicultural literacy as some of the 21st-century competencies expected of graduates leaving American's schools (Burkhardt et al., 2003). The works of Burkhardt et al. can be juxtaposed along the Ghanaian case, and student achievement competency frameworks are spelt out in the

standardised school syllabi and the 2007 educational curriculum reform document chaired by Anamuah-Mensah and the 2003 ICT4AD Policy. Consequently, RO2 sought to examine which competencies the graduates leaving university are developing with career counselling curriculum design for university students. Based on Figure 16, I explored the soft skills (also called 21st-century skills) acquired by the discussants during the FGD segment.

Regarding soft skills, the discussants identified *communication, self-confidence, interpersonal skills, leadership, teamwork, and networking* as significant themes for leaving school. For instance, a male student from the accounting programme shared how a university education has helped him develop good communication skills whilst on an internship programme in a government hospital:

Besides [sic] the way I communicated with people where I had my internship, I was on [sic] the account front [sic]. Still, I wanted to know something more about health issues where. I had to go to the labour ward to know some of the causes of sicknesses, so, at home, I can even prescribe minor ...minor [emphasis] medicines for my parents when they are sick, the cause of the cost of the medicine and other prices and other stuff for them.

Another female student shared her experience on the influence of leadership roles she assumed for her department association as the ‘Auditor’ of accounts. She had this to say:

What I can say is some of [amongst several soft skills acquired], let me say to my perspective my leadership skills have developed though I had that courage from my senior high school as a girls’ prefect, university education has given me more ability to communicate and talk to a group of people (Abi, Accounting Student).

From multiple perspectives, Abi further relates her experiences with interpersonal relationships, public speaking, and self-confidence skills acquired at the university;

... When I got here [university], with a bit of interaction I had, I was able to get [along] with the higher authorities [her lecturers, heads of departments, and other officials]. Aside from that one [interpersonal relationship] too, I have been able to get myself acquitted in terms of human interaction. I have become more sociable by giving suggestions on platforms [public speaking skill] (Abi).

Still, with confidence and morale, Felix shares experiences from submitting project reports as another practical university competency acquired from university when he submits;

Sometimes, the project reports from the internship were presented before our colleagues [class presentation]. That alone, that alone [emphasis] also boosts typically your morale. You know, okay, you can do something, you can stand before people and speak [communication] no matter the jittering as it comes, you will be able to shield it [stage fright] and weave through [overcoming stage fright]. That also has given us something good [soft skills].

Indeed, public speaking and composure before a group of people are essential parts of university training, where lecturers use presentation methods in class delivery. Students presenting portfolios from internships have been a platform for students learning to present their work to a panel of lecturers and colleagues.

A male student [Kwame] from the accounting programme believed that his leadership competency had already been put at the disposal of his family because he was in university. Before his admission to the university, Kwame was not considered a significant other [not knowledgeable] when settling family disputes. As leaving school, he was becoming a peacemaker resolving family disagreements as he notes;

I hope my parents and my community will see me as a valuable person because as I started [sic] from level 200 and 300 upwards, I was able to solve petty ...petty conflicts within the family [arbiter] by sitting people down [sic] and explaining things to them.

Kwame [student] continues to narrate how his learning experiences made up of

group tasks, meetings, relating to course colleagues, and the roles he played as a Financial Secretary in his campus church helped him acquire important leadership roles relevant to his family and community. He puts it this way;

I couldn't have done these [leadership roles] because I see things [differently now] because of the broad way I have learned [several school-based learning activities] and the activities in my church where I became the Financial Secretary; all these imparted for me to know [knowledgeable] and advice people.

A post-diploma student and freelance teacher, Felix from the accounting department summarise the critical skill of networking acquired from his university curriculum, considering that human capital is now acclaimed as the fifth factor of production in certain business circles, Felix aptly puts it, “*me, is [skills learned from university] knowing people [networking]*”. Continuing, he submitted that his networking and confidence gained from the internship programme is fulfilling for him in a narrative;

...It [networking] pushed me because I have worked [before coming to university] to some extent at places. Because of the internship where I was sent to [Ghana ???³Authority] the ??? Area and I happened to meet prominent people. It is like they give me that respect, and they position [posted] me in [to] a good place where I was leading a group where [sic] we usually go on invigilation to the ???, shops [clients premises]. Like [sic] when you go like [sic] the way they [clients] they treat [relate to] me is like it gives me exposure that gives me that confidence to move with big men. I was very impressed. But the time given to us wasn't enough [internship period].

Summarising the views on the benefits gained at the university, Razak, a human

³ ??? are symbols used to replace names of participants and organisations for ethical reasons in this study.

resource management student and a former student leader, responds to a question: *Has university education offered you additional skills?* He succinctly sums up the position of colleagues when he puts it;

Yes, yes, yes [emphasis]. That one [benefit of education] we [students] cannot run away from it because the word education is broad. That all faculties are trained. I think there are many things we wouldn't have access to if we hadn't come here [university]. Apart from the classroom tuition alone, if you put the tuition aside, the socialisation and the rapport, we met people and created opportunities [networking]. A lot of things. Education?

4.2.3 Business Education Curriculum Concerns

In the views mentioned earlier, students' experiences developing 21st-century teamwork, communication, and leadership skills were quite revealing. However, they raised interesting issues as shortfalls in their business education curriculum and four other thematic areas, including (i) assessment of learning, (ii) curriculum confidence, (iii) formative assessment, and (iv) practical-based education (see Figure 15). Hence, this section explores the issues raised under the four child nodes.

MacMillan (2007) identifies the essence of assessment as gauging students' learning and diagnosing their limitations and strengths to adjust teaching and learning accordingly. Indeed, assessment has been used for several reasons in school systems, including selection, placement, and progression to higher stages in educational settings, according to MacMillan. However, students' views on assessment have always been met with resentment and, sometimes, unfair practices. Hence, when discussants were asked about opinions on the curriculum they had to share, their comments did not surprisingly include their classroom assessment by their teachers, which often ignores their behavioural and psychomotor skills. The discussants question the mode of assessment of learning and the university's practice of summative assessment at the neglect of inclusive education as follows;

They [lecturers] don't think about the contribution you are making, and it's

about time lecturers changed their attitudes to identify the competencies of each of their students beyond the end-of-term examinations, including project activities and practical things [learning]. (Sam, HRM Class).

Reacting to Sam's views, Aikins offers a statistical perspective on the theory and practice dimensions of the debate; he submitted;

This guy [???, an IT genius], for instance. It can come that he can score 60% practically, but in the exams, he can't score that. They [lecturers] will expect you to chew and pour and score 60%. Meanwhile, when on the job, this guy can perform [in ICT] better than that person [with chew and pour scores] (Aikins, HRM Class).

Capping it up, "It is more of chew and pours mentality," according to Felix, an accounting student. The discussants' concerns suggest the gap between authentic assessment practices and inclusiveness, where learning assessment widely applies to different learners with multiple intelligences. Thus, the students questioned the continuous use of summative assessment of learning with pen and paper mode instead of project-based learning and explorative studies dominated by information and communication tools. Integration of ICTs into students' curricula is strongly recommended by the 2003 ICT4AD Policy and the 2007 Education Reform Committee's Reports.

The following comments represent further worries about students' confidence in their curriculum as they leave school. Hope, an HRM student sadly puts it, "Not enough. We have gained [sic] the basic one to cushion us. Expatiating Hope's statement, Abi, a female discussant from the accounting programme, shares a comprehensive piece on business education assessment and curriculum;

Let me come in [interrupting]. I am an accounting student. Looking at the trend right now and if I should get to the field, I will need extra courses to get me well equipped at the field if I should get employment right now.... for

instance, you are an accountant at the office, and your supply or Chain Manager brings or whoever brings [to] you some data that ...ooo, this is the number of things they purchased. You [accountant] don't know anything about supply chain management. He has not dealt with this project management, debt and management stuff. So when he brings you certain costs involving those areas. You are only interested in the figures. It's like you rush out to pay those figures. But if you get yourself acquitted in those areas, you can get some understanding and apply to know if the storekeeper is right or if he wants to do some conniving [fraud]. I think getting some extra courses can build our knowledge [Abi, Female discussant].

Linked to summative assessment is the practice of assessment for teaching and learning, also called formative assessment, where an evaluation of the teaching and learning environment, learner characteristics, content, and what can go wrong due to the hectic nature of teaching responsibility (MacMillan, 2007). MacMillan suggests that a key element of formative assessment is continuous monitoring by teachers to evaluate their students' actions towards teaching and appreciating the context of their progress towards skills accomplishments. Similarly, reflecting on assessing teaching and learning, Strickland and Strickland (1998, p. 31) mention that effective teachers are “always searching for patterns, supporting students as they take risk and move forward, and watching to facilitate better students learning... and try to understand how each student is progressing.”

In this study, participants views on their curriculum captured the phenomenon of formative assessment as their teachers seem not to involve them in preparations towards teaching and learning with submissions such as,

... they [IT teachers] will generally focus on one aspect of the Microsoft that is Excel, Excel, all the time Excel from level 100 to level 300 Excel whilst we have a lot of product under Microsoft [package]. They [Microsoft] have a publisher, they [Microsoft] have Microsoft SharePoint. We use all these tools

in our business operations (Sam, HRM student).

It emerged that students sometimes attempt to participate in formative assessment by offering opinions on what to learn by contacting lecturers with the requisite knowledge in an academic field. However, their efforts do not often receive the needed support from the academic leadership with this submission;

oh noo... no..., no..., no [protestation to whether they made efforts to contribute to their curriculum]. Sir, you [interviewer] can testify to this, Sir. I know you were taking us a lot of courses. I came to you several times because I know what you have and the impact that you can have on us. So you know, I know, and I could see it because if you are a leader, you have to know the future more (Raphael, a male student and course rep).

Continuing his [the course rep] submissions, he further elaborates with advice to leadership;

... what we need is [offering advice] like a lecturer. You have to be a leader. As a leader, you must know your followers' capabilities and competencies [formative assessment]. You see this guy here [referring to Sam, an IT enthusiast], for instance, he [Sam] knows [sic] more of IT. So, what would you do if you were a lecturer teaching him? The university is about building [sic] someone to make changes in our [sic] country. But here is the case we are basing on this A4 sheet [school leaving certificate]. The guy [still referring to Sam] is good. You can ask his class and look at what the guy is doing. They don't tally, perhaps because he [same] loves IT more than the reading courses in his field of specialisation [human resource management].

Concluding on formative assessment practices, Razak humbly submitted, *“It's about time lecturers changed their attitudes to identify the competencies of each of their students. And explore the competencies of their students.*

The final probe under the education theme examined how students' business curriculum links theory to practice for learners. For instance, interesting views were

shared when discussants were asked whether they could engage in project-based learning where theories and concepts are applied to learners' social and cultural environments. *Collectively, clearing throats, visibly shaking their heads, and responding in the negative* [interpreting non-verbal cues] and in a disagreement, they stated; *No. We don't have [linking theory to practice]* (all discussants in one of the homogeneous groups) in the following multi-perspectives offered;

I think this is a general problem that we have. Sometimes, wherever you go, their culture and business culture differ from what we are taught. Though you will have fair knowledge and ideas, sometimes it will have to take somebody to teach you again [orientation] (Razak, HRM Group).

Adopting a holistic view of the problem of a poor standard of education, Ike, a worker-student, laments;

And I think it is not here alone. All the universities. Not alone but also Ghana's education as a whole. That is how I see it. I can also use my office as an example. You know, I am the head of the news department at my workplace. And those that they come for internship. It is purely communication – conversational, written and those things. And everyday news the person cannot write.

Meanwhile, the person has taken four years of courses in media and communications but can't write, I mean everyday news. They are just teaching them theory instead of letting them know what transpires in the field. So now that the school is on vacation, they will come, but they can't even write news. So, it is a general problem (Ike, HRM Group).

As with the nature of RPA, disagreements and confirmations of issues are common in the students' discussions, as Ben from the human resource management class protested the earlier submissions by Ike and Razak with a [strong] voice:

Not at all. On some occasions, we were getting it, too. The person [lecturer] is trying to link what we are learning and the practical in the field. For instance,

I can cite Mr. ??? [Name withheld for ethical reason] Who was trying to tell us the reality we would face at work when he was teaching us ??? [Management course]. But put those things aside, we are not getting the links. (Ben, HRM Student).

Some even attempted to link the problem of applying theories to life experiences with the practice where students are given handouts as the only source of information to prepare for the examination. To the discussant, providing book ‘pamphlets’ only to students is seen as a detriment to developing creative and analytical thinking required for graduates leaving school to participate in the knowledge society today and questioned the practice of limiting students from constructing their ideas with the guide of reflective and inclusive pedagogy. A human resource student laments:

Sometimes, we need to face reality. If you give a student a handout, you limit the person’s thinking. Whereas he is going to focus on the handout. He knew [sic] that without that book, he wouldn’t have gotten an A. Without learning that book, he wouldn’t get an A. But the situation whereby we go the way the foreigners are doing it. The person will lecture, give you areas, and go and learn. He has finished lecturing. Go and do your research. I don’t expect you to write from any one particular book. Come out with what you understand based on what he taught you. So, at the end of the day, you get a broad knowledge of what you’ve been taught. But if you give the students handouts. Then you bring ‘portomato’ [objective] questions and ask the person to fill them in (Ike, HRM Group).

Ike commented, “*There should be a link between education and the job market.*” Another student (Emma, HRM class) added to Ike’s contribution, “*We should be clear in our mind that at the end of the day, it is not the degree that we are going home with but quality.*”

The human resource students shared the most views on the quality and relevance of the university curriculum in preparing graduates for the knowledge economy that

will create jobs and empower the youth after graduation. Perhaps the human resource students in this study appreciate human capital development issues much better than their accounting colleagues. Hence, another male student from the HRM group submitted that:

The input [fees] is more, but the output [quality learning] is less. Considering the amount [fees] we pay, it creates some kind of inequity. Because looking at how we are being taught in the class is knowledge-based [theoretical]. Everything is knowledge-based [theoretical] and is not focused on IT. The IT should be the most ...because if you want to link practical to theory, then the IT should come there [sic]. Linking practical to theory, IT should go there [promoting constructivism and IT as a bridge]. Without IT knowledge, we cannot link theory to useful knowledge. Sometimes, you will need the IT to integrate [sic] the HR and IT into [sic]. We learned about recruitment and selection. But if you have a database of job candidates, you have to use a database to consult [retrieve data].

However, the theory-to-practice theme generated the most divergent views during the interview sessions; as a female discussant (Emma, an HRM group) puts it, “With a few [emphasized] lecturers we have been experiencing it [project activities], other lecturers do not apply ICTs [technology integration literacy] to teach us beyond downloading Google lesson notes.” Similarly, in 67 words, Abi (accounting voice on the subject of relating theory to practice) has this to say;

The internship programme is to give [sic] students the opportunity to apply theory to the practical. What is taught in the classroom differs from what is being done in the field. For instance, organisations use accounting software to balance their transactions. So, you will see that what is being taught in the classroom differs from what is in the field.

Sadly put, Rita (a female HRM student) concludes, “...yes, even with the job market, people are going to school just to get certs[certificate] for higher pay and

knowledge pursuit is often missing in our educational system today. The views expressed by discussants validate the view that despite the six-month internship programme organised for students to be in the field to learn from industry giants, there seems to be a gap in training programmes and students' ability to operationalise their constructs in the field of business.

4.2.4 Suggestions for Improving the Business Curriculum

The third theme explored under education involved students' perspectives on solutions to their business curriculum problems captured as *Way Forward* (Figure 16) in this study. Recognition of the educational problem was put forward as "... *the educational system has just been messed up. We have to reorganise everything* (Abi, a female contributor, accounting class). On a similar submission on falling standard of curriculum, Felix (accounting Group) concurs with Abi's opinion that;

[Clearing his throat and laughing] *That [educational system] is perfectly true. Because of that, we have seen the current educational trend in Ghana. And when you see the young guys going, they see it as fashion. Because you don't see much of a competition like we used to. The competition is not there as we are seeing. As we are saying, most of the things [learning] must come from the basics before they climb up. And because of looking at the system, the duration given too is very limited. That is posing a problem*

Based on Felix and Abi's submissions, subsequent discussants had these to say on the way forward for education in general and learning in the university;

To me, quality in education means when a graduate leaves [sic] school and goes out there to perform well. In addition, learners must seek real knowledge to help them solve their environmental challenges. [Authentic education] (Sam, HRM Group)

Abi (a female accounting student) shared a brief history lesson whilst joining the 'political' debate as to which is better: a three-year or four-year senior high? She

believes that her senior high school syllabi were probably aligned with first-year university academic content during her days in pre-university, but that is not the case today. Abi bemoans:

And sir, please let me come in, sir. It's very important. When it comes [sic] to the curriculum, they use at that place [senior high school]. You see, during the four-year group, it was modernised to suit the first level 100 topics regarding graduate work. So it is like you get acquitted and introduced to those topics because they are already advanced in certain things [talking about account areas] when you enter here. Topics like branch accounting and certain things were introduced to us [presumably, the interviewee might be a product of the 4-year system]. But those children [the 3yr group] could not capture that [the topics]. Everything is just new to them. It puts a lot of stress on the lecturers [at the university].

In support of an earlier view on the value and purpose of today's education for the knowledge economy and job creation by Felix, Abi extended her vituperations to the responsibility of individuals, local communities in a learning environment, and the state in promoting education quality in Ghana when she interjects;

Sir, let me come again [with her hand raised]. I think education to get your child educated [sic] is not only about the government. The parents and society have some roles to play in education to get it on well. So, in terms of the societal role, the parents must do their best. The environment where the child is learning too must be well-equipped to meet the learning capacity of those children. If not, they cannot learn well.

In conclusion, the participants in the focus group discussions believed that, perhaps, technology integration literacy holds a significant key to addressing the trajectory of Ghana's schooling system. Indeed, the desire for Ghana to join the global giants in education has been scripted in policies (2003 ICT4AD) and educational reforms (2007). Technology integration literacy is probably yet to receive full attention

from implementers of school curricula and mediational administrators in Ghanaian teaching universities (Yidana, 2007). Consequently, discussants' vociferous and disenchantment with being left behind in the global village, which uses the power of the Internet as a driving force to attain degrees, are acknowledged within the context of technology geeks' views. Oblinger (2012) thinks the global marketplace has equal opportunities for ICT literates. Indeed, significant others continue to question the employability skills of African graduates due to perceived knowledge and curriculum gaps (McCown, 2015; Ananga & Anapey, 2015). Consequently, the interview sessions in this study produced several suggestions from students regarding how computer technology should be used to improve teaching and learning goals in the Ghanaian business curriculum.

Discussants had also suggested the integration of ICTs into various business curricula. For instance, Sam (an IT Enthusiast) calls for holistic integration of ICTS;

The IT should be the most ...because if you want to link practical to theory, the IT should come there. Linking practical to theory, IT should go there [promoting constructivism and IT as a bridge]. Without IT knowledge, we cannot link theory to practical knowledge. So sometimes, you will need IT to integrate HR and IT. We learned about recruitment and selection. But if you have a database of job candidates, you have to be ICT literate to consult it [use it].

On a revealing note, the discussants were conscious of the roles they needed to perform to enhance the quality of learning by 'turning the gun' on themselves, literary when a male discussant blamed themselves [students] for failing to apply what was learnt in school to real life in a statement;

I perceive different views. Sometimes, we have been taught how to prepare attendance sheets [with a computer] but go around and ask people [colleague students] if they can use the computer to prepare attendance sheets. So what is

the reflection [sic] and what the person has been taught? That is the education. There should be a transformation, and that is education. What is the education if we are taught how to make a drink [minerals] and you cannot make it? (Ike, HRM Group)

Razak supported Ike's comments with his *submissions as he blamed students' attitudes towards learning as well;*

That one [transfer of knowledge] is our making [blame]. Sometimes, they say you can force a donkey to the riverside, but you cannot force it to drink water. On the other hand, some aspects of it ... university ...universal. That is why they say universal education. Everything is involved. Look under normal circumstances [sic], even lecturers giving us handouts they are not supposed to do it. Sometimes, it is against the ethics and norms of the university

Advocating life-long learning as a solution to curriculum and learning challenges facing university graduates, Rita (HRM student) noted,

When we are outside, we need [to] learn again, like self-development and maybe learning as he [Sam, an IT enthusiast] did. He learns online. Perhaps we can also develop ourselves further. Learning new things again. Learning should be more practical than theoretical.

Finally, Sam proposes ICT as the conduit to connect theory to practices in discussing improving teaching and learning goals, *"I will talk about IT. The IT should be the main link [conduit] to link [sic] student curriculum to practice."*

4.2.5 Interactive Model of Curriculum Theme Explored

According to Creswell (2012:257), interpreting qualitative findings requires the investigator to step back and form more significant meanings about the phenomenon based on personal views, comparisons with past studies, or both. While interpretation of the findings submitted in Section 4.2 is reserved for the discussion chapter, I present a summary of findings with narratives from cases for identification and evaluation.

Indeed, Figure 17 shows the 15 interrelating themes explored under RO2 from three

broad themes - curriculum issues, 21st-century skills, and suggestions for improving business curriculum. In summary, four sub-themes emerged from curriculum concerns, six soft skills (21st-century skills), and five interesting ideas offered by the panellists on arresting the trajectory of education in Ghanaian business schools.

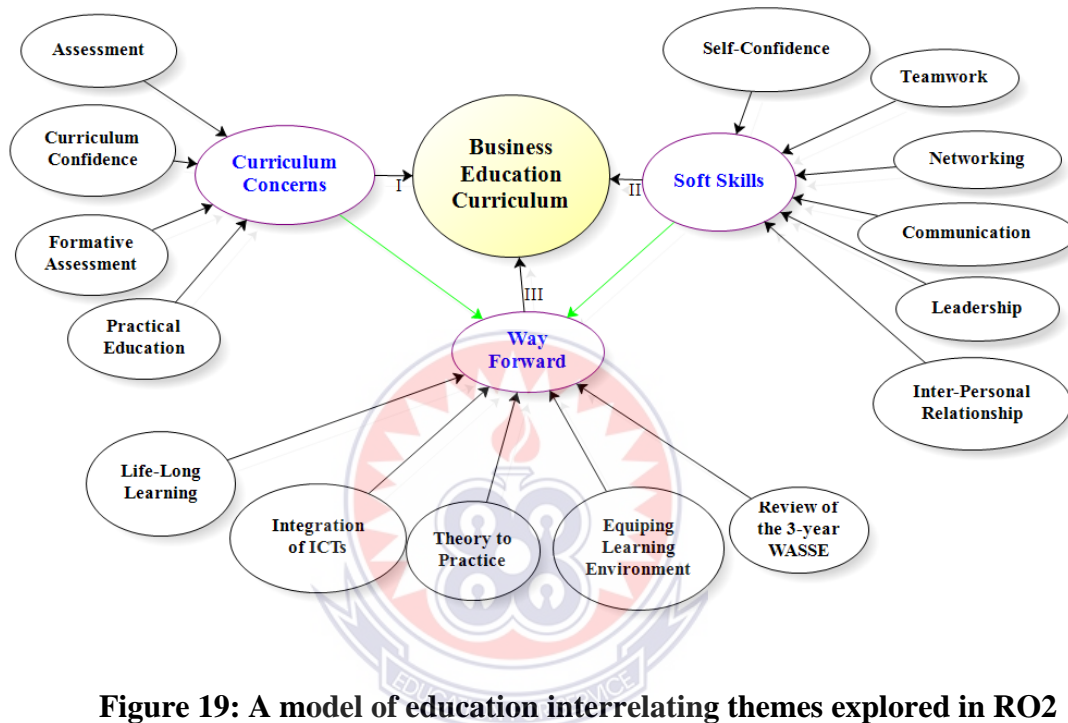


Figure 19: A model of education interrelating themes explored in RO2

Source: TMNVivo Version 10 screenshot from FGD data, 2016.

Arguably, the respondents' views on the *education* theme in this study can ignite debates among stakeholders in curriculum design. More importantly, the career development curriculum needs to take note of concerns expressed by students on which competitive skills employers desire in the current job market. Similarly, school counsellors should guide their students' career choices within existing teaching and learning practices in Ghanaian universities with large class sizes, dwindling educational resources, and teacher quality at all stages of Ghanaian schools.

4.2.6 Indigenous Businesses and Knowledge Systems

The second theme under *RO2* also sought to investigate business students' knowledge about their curriculum's role in understanding Ghanaian indigenous business operations. Entrepreneurship and business are knitted concepts in history (Drucker, 1985; Austin, Stevenson, & Wei-Skillern, 2006), and the role of indigenous *knowledges* (Dei, 2012; Anguala, 2008) about environmental scanning cannot be overemphasized in today's information society. Therefore, I sought the views of student panellists on local businesses regarding which type of company they would work with after graduation and why. In addition, their ideas on what solutions could be applied to solve the identified challenges for Ghanaian indigenous businesses were also examined in this study.

Figure 18 shows an overwhelming 91% ($n = 10$) of the student panellists on the FGD opted to work with foreign-based companies, with only 9% ($n = 1$) choosing Ghanaian-owned companies. The 91% preference rate coheres with McCown's (2015) finding that 65% of graduates from Sub-Saharan African countries preferred working in the private sector.

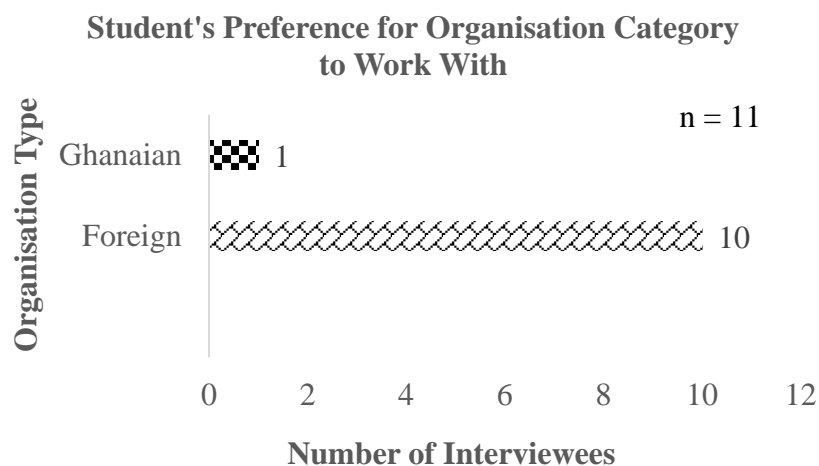


Figure 20: Students' preference for Indigenous or foreign business

It was instructive to note that the only student who preferred indigenous firms was an

ICT enthusiast with some database applications designed for local firms who had already graduated with honours in human resource management.

Based on the students' preference for foreign-based firms, they identify some inherent operational challenges Indigenous Ghanaian businesses face as the reasons for their choices during the FGD sessions. Themes ranging from lack of business education to competitiveness of local firms emerged from the discussion. The dominant issues debated according to percentages of narratives (words) and individuals (references/cases) captured are presented in Appendix K (2). Twenty themes were captured by the coding process based on the meanings the discussants attributed to the challenges facing indigenous Ghanaian businesses. However, 15 interrelated themes merged with the '*competition*' theme, and the final list of factors considered by the discussants is presented in Figure 19, with narratives answering the second theme of RO2 in this study.

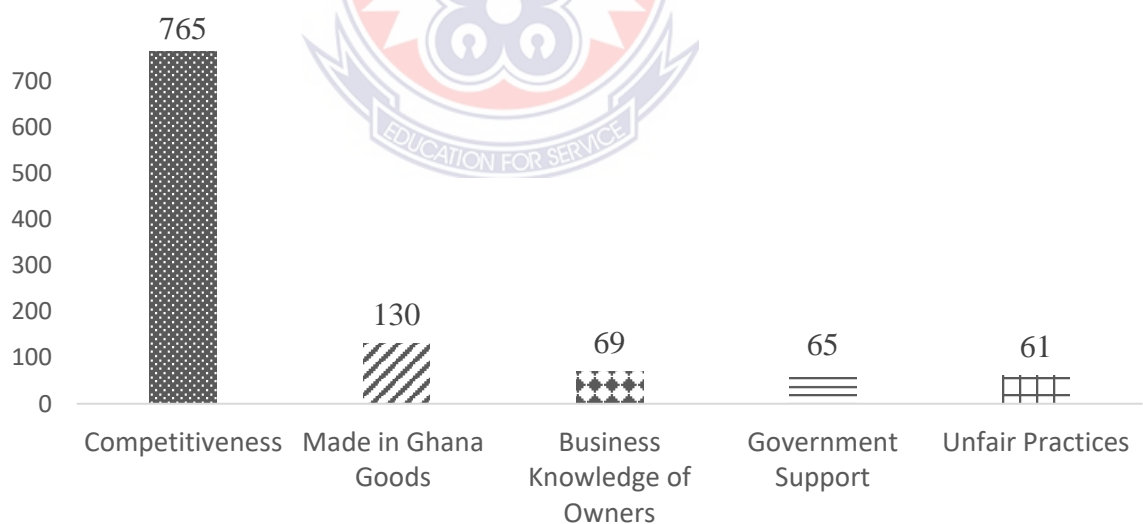


Figure 21: Students' views on Indigenous businesses

Five main themes emerged as issues informing students' preference for foreign-based organisations as employers of choice in the Ghanaian labour market. The term *competition* has been used loosely to refer to business activities such as branding,

capital injection, innovation-led operations, and gaining market share with a company's products and services in this study.

With over 700 word counts, competitive forces dominate the attention of discussants in the FGD sessions. The second concept captured from the narratives of cases in Figure 19 was the notion of *made-in-Ghana goods*, a phrase popular with a national discourse on promoting Indigenous businesses in political and trade sectors. With word counts between 61 and 69, three other discussion themes reflected knowledge of equity owners, instructional frameworks supporting Indigenous commerce from the government, and legal regimes governing trade.

Above all, of significance to the current study was the business knowledge of owners, which can be put on a broader perspective of entrepreneurship attributes and opportunity recognition (e.g. Gartner, 1988; Ireland, Hitt, & Sirmon, 2003). The implications for curriculum design, continuing education for local business owners in the Ghanaian environment, and guidance services for incubation for prospective entrepreneurs from business schools could be considered. However, students' views were used as anecdotes in support of the emergent themes represented in Figure 19.

The theme that receives the least discussion is unfair practices where some Ghanaian business operators are perceived to connive with foreign investors to avoid tax. To this student (Ike, HRM Group), some Indigenous businesses are not forthright with their business operations; as he puts it,

Now we have the free zone board, so instead of now, when you register as a foreigner, you will be given a range of businesses that you can register for, and you won't pay any tax for that one. So some of the foreigners are taking advantage of it and using Ghanaian names to register to avoid paying tax [however, the source of this student's allegations could not be verified in this study, but I will want to say that is his view, and I respect it as such]

Another student cited a lack of government support for Indigenous businesses. Indeed, the country's investments in infrastructure to attract investments and support local businesses are key to entrepreneurship takeoff. Hence, the following views were expressed:

And for sure [emphasis] and now because of these [income tax, NHIS, etc.] taxing systems and those sort of kinds of stuff [sic], our company is [referring to a local firm he works for down now (Raphael, HRM Student)].

Rita conjectures,

... if Apostle Kojo Sarfo [a Ghanaian entrepreneur and a philanthropist] were to be out of this country [a foreigner], he would get investors to help him to come out [expand his business operations] to establish a world-class product.

Business operation knowledge of indigenous business owners has been discussed as another reason a foreign business was preferred over local counterparts. Kwame, an accounting student, believes that Indigenous equity owners and employees lack formal business operation knowledge for effective and efficient management of their firms when he whimsically submitted;

... there is this school I work for [sic] on [sic] vacations. The proprietor and the children do not have proper books of accounts, and you realise that they spend their incomes, especially the daily feeding money, without budgeting. For me, it's not enough. They don't sometimes know how much is involved in the business, like a petty trader selling pepper, tomatoes and other stuff, instead of knowing [that] I started with this amount [capital] and this is how much I will get out [contribution] of it and at the end of the day she will use all the monies, and next day she wouldn't get the money to buy stocks

The fourth theme that emerged was the perceptions of Ghanaians about goods and services from indigenous firms. Citing an inferiority complex as one of such reasons, Rita, a human resource management student, suggested that;

Because he [the business owner is a Ghanaian, even when his product is up

[on the market], people will look down upon the product and will not have a good image of the product. But the perception majority of Ghanaians have about his [owner of the business] products. This affects Ghanaian products, so we cannot grow higher [growth]. And I will also say there is a lack of trust. And because he is a Ghanaian, when the product comes out, they will look at it and will not even support him, and he will not even get investors, so he will go out to compete

On the same tangent as Rita's inferiority view, an opinion from the accounting class (Felix) sounds, "We [discussants] know that as for the Ghanaian businesses when they start, it is from hand to mouth [subsistence]. Our minds don't [sic] even go there. We always looked at the big and known industries [multilaterals]. Perhaps Felix's consideration of the multilateral companies might reflect the practice of business curriculums' persistence, citing business cases from global giants such as Yahoo, Google, Enron, General Electric, and Coca-Cola.

In a follow-up question on negative perceptions made in Ghana goods, three contributing factors were identified by the students with trust issues mentioned by discussants. For example, Rita (a female student contributor) says, "... that is an inferiority complex. We don't have trust in ourselves and always think that the white man is always superior." On the same trust problem, Ike (a male HRM student) indicated, "... we despise ourselves, let alone our products?" He asks.

Using interpretivists' ritual of multi-layered approach to subjectivism and reflexivity (Stake, 2010; Yin, 2011), mind mapping tools in NVivo (QSR International Pty Ltd, 2009) enabled the current study to account for three interrelated themes that characterised discussants' opinions represented in Figure 20 as neo-colonialism, trust issues, and inferiority complex. Indeed, all three themes have relevant applications in the business curriculum's developmental stages of entrepreneurship propensity.

Developing the cognitive capabilities of African graduates to appreciate their Indigenous systems (Asante, 1995; Anguala, 2008; Dei, 2012) aptly reflects the discussions under the made-in-Ghana goods debate in the current study as well.

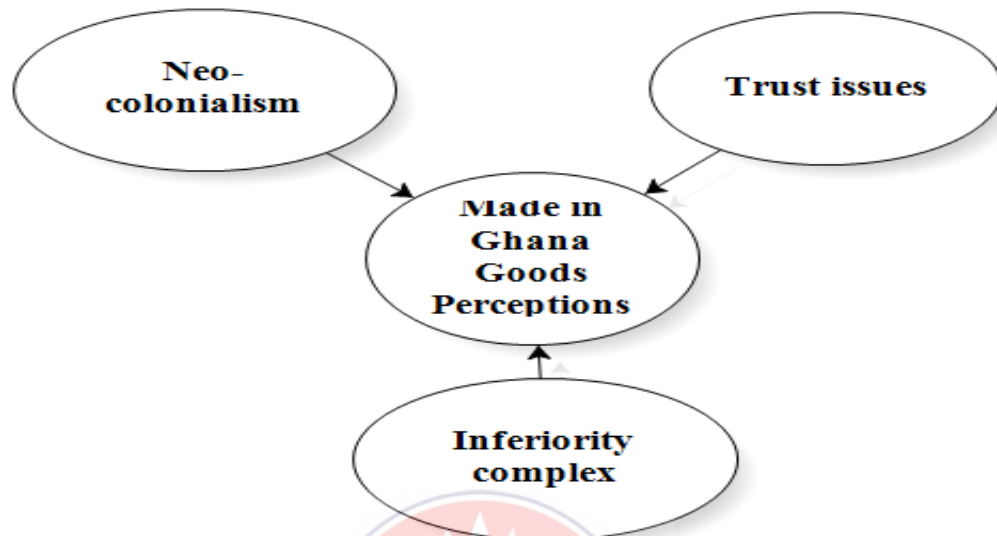


Figure 22: Perceptions of Made in Ghana Goods (Emergent Themes)

Source: FGD data, 2016

Still, in Figure 20, the second important theme originated from Pan-Africanist thinking. Others popularly refer to it as neo-colonialism, a form of mental engagement of the African prodigies through agencies such as the World Bank and the IMF and the internationalisation of nations' sovereignty. To students in the FGD, Ghana's colonial history still plays the dominant role in freeing its citizens from the perceived reference to the Western academy and the degradation of indigenous knowledges and resources. Razak, a former student leader, poignantly captures the group's view on the Westernisation of Ghana's business space using rich linguistic constructions with simile and allegory:

I think it is the result of neo-colonialism. Because they imposed their products on us during the colonial days so, we developed... it is just like giving your childhood says you don't eat 'fufu', but you go and stay somewhere that they have been giving [sic] you fufu and as time goes on you developed [sic] taste

for fufu [Ghanaian rich staple food popular amongst the forest zones] meanwhile in your house you don't eat fufu.

Continuing his analogy, Razak reminds us [discussants] of goods importation from the colonial masters:

So, in the olden days, they brought you iron sheets; meanwhile, in the Northern Regions, at that time, we used grass to roof our buildings, and now we finally have iron sheets. Later on, we realized that the grass we had been using to roof our houses was not the best, so we developed an interest in using iron sheets (Razak).

Closely related to the 'trust issues' theme is 'inferiority complex, as Ben (HRM student) puts it: "...that [lack of patronage for Indigenous goods and services] is inferiority complex. And we always think that the Whiteman is always superior, and we despise ourselves."

4.2.7 Reasons for Foreign Goods Preferences

Finally, discussants considered the lack of competitive business operations as the dominant reason why they would prefer foreign firms to Ghanaian-based companies, in line with earlier thinking of Darko (2011) on the failure of Ghanaian firms due to lack of patronage of indigenous goods and services. Consequently, discussants identified 11 factors contributing to the uncompetitive nature of indigenous companies compared with foreign products with investment decisions by indigenous firms. This led to the count of narratives in Figure 21. The students identify 11 interrelated sub-themes with entrepreneurship challenges dominating. The top five reasons cited have innovation and opportunity realisation attributes much respected by nascent enterprise owners, which include generating an investing portfolio, branding, working capital management, business planning, and innovation. These five factors have reflected the historical literature on entrepreneurship from Schumpeter (1934),

Shane and Venkataraman (2000), and Drucker (1985). Even the remaining six points in Figure 21 still hinge on the approach of Indigenous businesses with definitiveness of purpose and the desire to solve social disequilibrium (Acs & Audretsch, 1991). Consequently, the current segment uses data from the students' discourses to support the 11 themes in Figure 21.

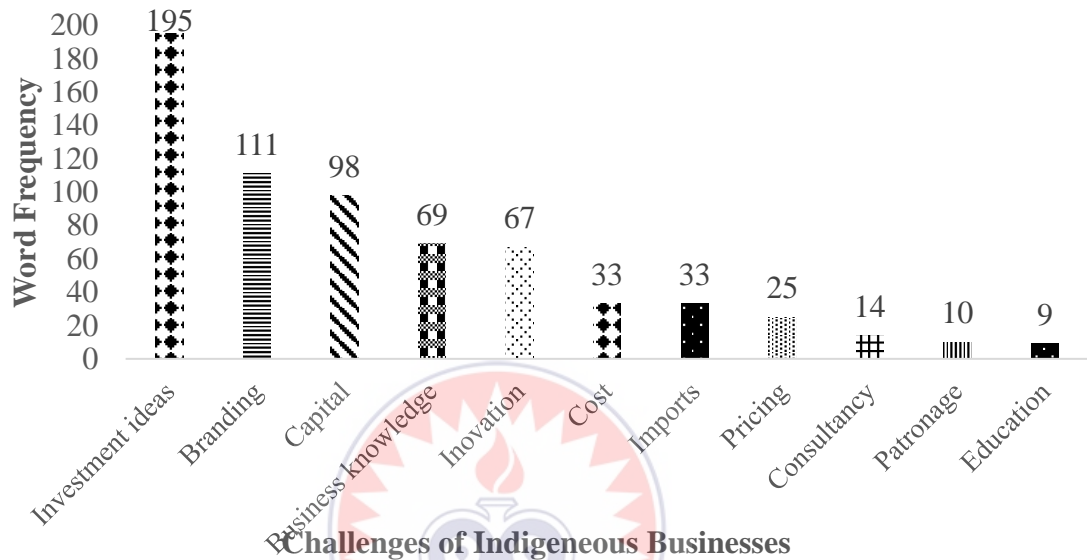


Figure 23: Challenges of Ghanaian Indigenous Firms

Source: FGD data, 2016

The following comments represent further students' comments on the investment problems of Indigenous companies:

They [Indigenous business owners] are not able to tell how much from returns to the business, that is why the microfinance businesses are cheating them [Indigenous businesses]. If they know how much their companies will yield going for the loans, they will not even go for the loan [since it will not be viable after risk assessment] if they have financial management skills. They [owners] will be demanding from the same businesses [a challenge confronting indigenous businesses in Ghana]. When it happens like [that] because the resources are [sic] not enough here, the little that will come in [returns], it will go into the family coffers for domestic use (Kwame, a male accounting student).

Secondly, branding or image management of Ghanaian businesses has been

discussed as a contributing factor for foreign companies over local Ghanaian firms.

Students commented on brand issues as follows:

... and how we brand our products because, in Ghana, our business doesn't brand their products in such a way that it will attract the customers so that they can reap a lot of market share. Customers' mindsets are influenced if you build good brands, So I think the Ghanaian or the Ghanaian industries don't build good brands, so their reputation ... their reputation of the Ghanaian companies is not of value (Ike, HRM student).

The third factor is capital for investment and expansion by the indigenous firms.

The students also complained about the local companies' inability to raise finances, as indicated in Mike's (HRM student) comments:

It all boils down to the capital we inject into the business. You know the foreigner who [who] is coming to invest in Ghana has a huge capital. But here, it is just an expected capital that we invest, so obviously, you are competing with someone who is already ahead of you in terms of capital in terms of investment. So definitely, you [are] going to [be] struggling with somebody [who] is there in terms of capital, and he[she] will not even get investors so that he will go out [with].

Abi, a female discussant, directly puts it as a "lack of funds or capital."

On innovation, a student had this to say:

I can say that looking at what [is] happening in the country ...err, even the foreigners who come to Ghana to operate the same, I mean the same business we have. Still, they are always ahead of us because of their level of thinking and the innovation they inject into the companies. We still use the orthodox or think back to the 19th century (Ike, HRM student).

The cost of doing business by Indigenous firms has been brought to question as not prudent for the local firms and decisions to import raw materials instead of using local raw materials, as HRM student puts it:

While the person [business owner] will be importing or engaging in

something, he cannot acquire the resource here. Importing raw materials costs a lot. And this is making some the products ...I mean expensive. (Ike, HRM student).

Whilst Abi, a female student, thinks that local firms' external factors - taking into consideration lack of funds/capital, inflation, and economic crunches – are likely to affect the pricing of Indigenous products, Ike, a male student from the HRM department concurred “... *turnover is significant in a business where you think that let me get huge profits he thinks getting small profit is better.*” Ike extended the institutional argument that indigenous Ghanaian organisations seemed to have problems with business support services. Finally, consultancy, patronage, and education were identified as the last three factors that militate against Ghanaian businesses; hence, their non-competitive posture compelled an overwhelming 91% (Figure 18) of students in these discussion groups to opt for foreign over local companies. Sam (HRM student) thinks the role of consultants does not help matters either for local businesses as he puts it, “*But when somebody wants to establish a business, he wants to engage a consultancy firm that is expensive beyond the local companies [affordability].*” Emma (HRM accounting student) had this to say on how imports seem to be hurting the local firms:

That business will import raw materials outside the county. Importing raw materials costs a lot. And this is making some [of] the products ...I mean expensive. So you know we Ghanaians cannot patronize those products, instead of them based on our raw materials that we have to gain a competitive advantage of ...of ...over other countries. We are not doing that. So, there is no way we can compete with the global companies and the global companies whilst we ignore the resources we have.

In their concluding remarks on improving the competitiveness of indigenous Ghanaian businesses, five themes emerged from the FGD data, summarised by several

narratives under each theme in Figure 22.

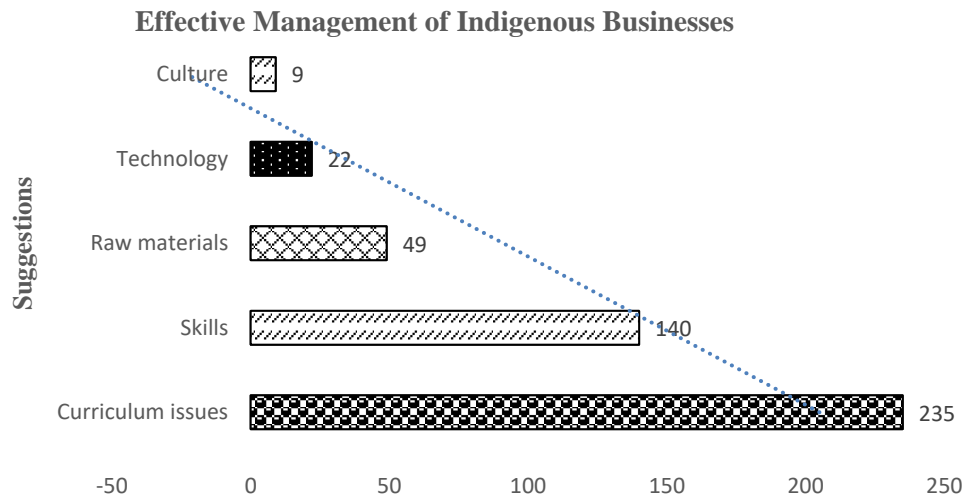


Figure 24: Suggestions for improving the competitiveness of Indigenous firms

Curriculum considerations constituted the highest theme, with 235-word narratives with adaptation to cultural issues (nine words) being the least options for effective Indigenous business operations. Furthermore, the discussants believed that business skills development and technology integration into production and business processes could immensely help the growth of Ghanaian-owned businesses. The business students at the discussion table proposed cultural re-orientation for the Ghanaian, which will help to promote self-concept. Customarily, the use of case narratives to debate the emergent themes in the current protocol was also adhered to in this study.

The discussants believed that business curricula in universities should be streamlined to improve indigenous businesses in Ghana. Responding to how students' curriculum could be translated to support Indigenous businesses, Felix, an accounting graduate, raises salient questions on foreign-dominated curricula often used in Ghanaian education and proposes authentic assessment as a critical framework for

inclusive education;

Yeah, sir. We have to learn accounting here with business aspects [principles and practices] but to talk of it frankly speaking, we [students] can broaden our minds to this issues as while in school developing, we have to build portfolios of works by engaging in projects that enable us to investigate the local community [Winneba] to understand the circumstances that inform how Indigenous business operates. So, it is a concept. I wish it could be taught in the business programme. Sir [referring to the interviewer in this study], how can we understand our environment when lecturers only tell us about the multinationals located in New York, for instance?

Advocating for a broader discussion framework on Ghanaian education, Abi, an accounting graduate, highlighted the need to promote Indigenous knowledges in Ghanaian schools. She submits;

I wish there could be a forum on this [relating student's curriculum to practice in enhancing Indigenous businesses in Ghana [Offering suggestions] so that both lecturers and students can explore [sic] the ways we transfer knowledge to help our petty trading and more before we complete school.

Another advocate for authentic learning, Kwame, also a graduating accounting student, shared this:

Maybe at the end of the semester, alongside topics, lecturers can send us, for instance, in groups for assignments like sometimes how you [referring to the interviewer who was their Part-time Lecturer in Introduction to Human Resource Management] have been grouping us [to] go to these group of people [Indigenous businessmen and women] to research how they can get money to start their businesses and how are they able to get their returns back like it will give us the idea from that genesis (Kwame, Accounting Student).

The second area students offered suggestions for competitive advantage was acquiring and utilising industrial raw materials. Raphael, an HRM graduate, said, “There are a lot of raw materials here [Ghana], but we have to depend on our raw

materials. The current businesses are copying the foreign business.” Another student (Sam, an HRM graduate) suggested technology to support local businesses by developing computer software. *“I want to design software to help them [the private school] manage their canteen businesses, for instance.”* Similarly, skill issues dominated the respondent’s attention with the following views. *“What I will suggest is that we [accounting students] have to go out there to support them [Indigenous business owners] with accounting services, for instance.”* (Felix, Accounting graduate). Raphael, a human resource graduate, joined Felix’s chorus on skills transfer: *“So, with the little knowledge that I have acquired through my four-year study here, I have to use that knowledge to back my local industries.”* Illustrating how relevant students’ knowledge would be to the local economy, Kwame shared his experience of drawing business plans for start-ups already as a graduating accounting student;

I say okay, then how much do you want to involve in this as a start amount so that I can draw the plan for you so that the little profit you will get on it will be theirs so the business will go on? I started drawing the plan, so now that I am going home, the industry will start. Now that you are saying it, that is where it [education] should start from [sic]. That is where we can apply what we have learned.

On the sub-theme of culture, only one student submitted, *“Africa per se we have to adopt our culture [with business activities].”* (Sam, HRM Student)

4.2. 8 Summary of Research Question 2

Using narratives from 11 discussants in two homogeneous groups from human resource management and accounting backgrounds, the RPA method was used to solicit views on four main themes that answered Research Question 2 in this study. Research Question 2 sought to interrogate business students’ lived experiences on their curriculum, Indigenous pieces of knowledge, entrepreneurship, and pedagogical

integration of ICTs into the curriculum. The interpretivists' frameworks for qualitative data gathering, analysis, interpretation, and reporting (Johnson & Christensen, 2008; Yin, 2011; Creswell & Clark, 2011) guided the current study. Thick narratives and in-depth approaches to data analysis (Cohen et al., 2007) yielded insightful emergent findings based on in vivo coding using Nvivo software (QSR International Pty Ltd, 2009). The views expressed by students on indigenous businesses reflected a lack of entrepreneurial resources for the local businesses to compete favourably with multinational enterprises.

Students also lamented that mental slavery by Ghanaians due to colonisation seemed to be translated into popular negative views on made-in-Ghana goods. Thus, the critical minds of some Ghanaians on an inferiority complex engineered by neo-colonialism and the tendency to despise knowledge from the African academy (Dei, 2012). However, technology transfer has been advocated to tackle the trajectory of poor positions in Ghanaian businesses so that they can compete favourably with the West. Above all, discussants also questioned the perceived absence of authentic learning experiences in business education curricula, with lecturers perhaps doing little to link theory to practice for their learners. In conclusion, respondents succinctly advocated for *Sankofa* [returning to Indigenous knowledge] as a means of self-empowerment and creating entrepreneurial opportunities for Ghanaian unemployed youth based on Anguala's (2008) prescription for homegrown solutions to Africa's economic crisis and not depending on Eurocentric solutions through their financial agencies dolling out bailouts to weak economies.

4.3. Integrated Model for the Research Questions 1 and 2

This section in the results chapter presents the final theoretical and conceptual model from Research Objective 2 (RO2) and the quantitative data on Research

Objective 1 (*ROI*). Based on the emergent results generated from the discussants in *RO2*, students' views seem to be guided by the critical theory of education (Eagleton, 1991) and anti-colonial theory (Foucault, 1980; Dei, 2012; Simmons et al., 2012). As a practice in interpretivists' approach to qualitative analysis, theories often emerged from tick description where theory-based is used to explore the views of those studied (Stake, 2010; Yin, 2011). The current section seeks to represent the overall theoretical and conceptual frameworks with interrelated themes explored using interpretivist (*posteriori*) and positivist (*priori*) methods of scientific investigation (Creswell, 2012).

In Figure 1, the study proposed a theoretical and conceptual model based on the background of the study (Section 1.1). The proposed model emerged from theoretical and empirical literature reviews, which ultimately guided the research design (concurrent mixed method), sampling (sequential mixed method sampling), instrumentation (questionnaire and FGDs), methodological approaches (pragmatists' frameworks), data management (multivariate and thematic analyses), multivariate assumptions testing, results presentation, and discussions in the current work. Hence, based on multivariate and interpretivism approaches to data analysis, a final theoretical and conceptual framework emerged, which ultimately accounted for the emergent (interview data) and supplementary findings from the four hypotheses tested in the results segment of this research.

Figure 23 shows the framework for the four significant hypotheses tested and the two research questions explored in the study.

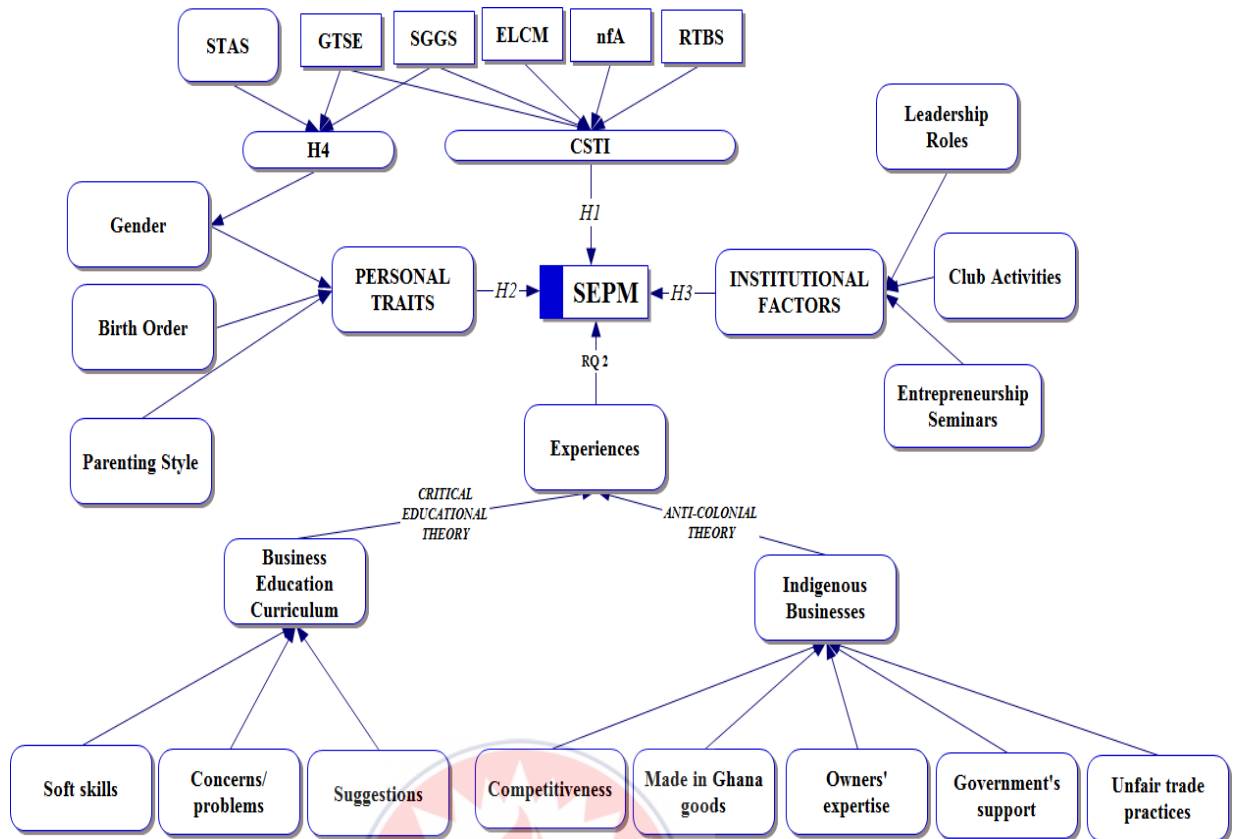
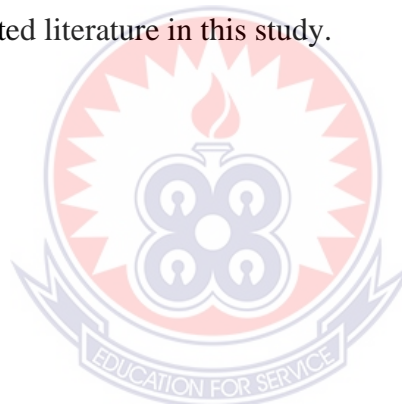


Figure 25: Emergent theoretical and conceptual framework for the study

Hypothesis 1 used five cognitive factors (GTSE, SGGS, ELCM, nAch, and RTBS) with computer-specific technology integration (CSTI) as a covariate to predict students' entrepreneurship propensity measure (SEPM) in the MANCOVA model, whilst Hypothesis 2 accounted for personal traits (PTs) as a discriminatory variable to account for stages of SEPM. Similarly, institutional factors were tested as discriminant variates in the exploration of SEPM factor for Hypothesis 3 with students' stages of technology adoption (STAS), self-efficacy (GTSE), and goal-setting (SGGS) as variates to differentiate students' gender in Hypothesis 4.

Finally, using a rural participatory appraisal (RPA) to FGDs, the study explored two broad themes (*curriculum* and *Indigenous businesses knowledges*) with eight interrelated themes that emerged and were reported in this section. The RPA approach seems to support students' expressions whilst member-checking roles might be diffused amongst the discussants while exploring their curriculum issues, technology,

indigenous, and entrepreneurship knowledges. In tandem with the critical theory of education, which views education as delineating students from their indigenous social and cultural settings, it also leaves them ill-equipped with requisite skills for personal and social growth, constituting large portions of this study's emergent themes. Significant others joined the debate on critical theories of education and argued that Ghanaian lecturers' focus on foreign curriculum at the expense of inclusive education that explores the lived experiences of its citizens for job creation could hurt its employment and creative sectors. Similarly, students extensively engaged in anti-colonial thoughts on issues affecting Ghanaian businesses and education. In sum, Figure 23 is an integrative model backed by theoretical and conceptual frameworks emerging from the related literature in this study.



CHAPTER FIVE

DISCUSSION

The present chapter attempts to explain the theoretical, practical, and statistical significance of some key findings from the study. High grand theories of cognitivism underscore students' entrepreneurial development, which has been explained with Ajzen's (1991) Theory of Planned Behaviour for the experimental variable (SEPM). In addition, the study uses Critical Discourse Analysis (CDA) (Fairclough & Sayer, 2004) to engage the findings from the results chapter. The method of discussion is explained in the CDA approach, which entails working in a 'transdisciplinary' way, combining dialogue with other disciplines and theories that explore contemporary change processes (Sum & Jessop, 2001). Hence, broad interdisciplinary dialogic procedures involving but not limited to the Concern-Based Adoption Model (Hall & Hord, 1987), Diffusion of Innovation (Rogers, 1995), and postmodernist theories (Africanism, Colonialism, Power, Gender, Education, and Institutional frameworks) guided the interpretation of both quantitative and qualitative results with anecdotal views. For instance, Asante's (1995) framework of Afrocentrism enables the current study to interrogate Westernised theories such as self-efficacy, goal-setting, need for achievement, and risky behaviours with the findings. Finally, a thematic approach evaluates key research findings, with conclusions and recommendations drawn appropriately.

Significantly, guidance and counselling implications of the key findings in this study are espoused. For instance, Adlerian's theory of child rearing and birth order

nuances (Sharf, 2012) are explored within Africanists' views of contextualising knowledge. Career choices and aspirations of graduates are also examined with literature on the changing dynamics of today's workplace, posing intellectual dialogue amongst career development experts (e.g. Tractenberg et al., 2002; Santos, 2004).

5.1 Cognitive-Based Counselling for Entrepreneurship Career

Significant others passionately argued that the unpredictable patterns of emergent jobs burden career counsellors in the knowledge economy (Santos, 2004). The current segment of the discussion attempts to draw lessons from cognitive-based psychotherapists' whilst providing career choice counselling for today's university graduates to create jobs.

Similarly, the quest to achieve economic growth has been described as an elusive process for Africa's economy (Kamara, Bousrih, & Nyende, 2007). Earlier, images such as economic stagnation and retardation were used to describe most countries on the continent in the 1980s (Kempe, 1987). However, with the current global economic order where knowledge and information are the primary commodities driving businesses and nation's economic growth with industries' key assets reside in their employees (Laudon & Laudon, 2007; Thompson Jr. et al., 2005), the overarching question for African countries should be how competitive are the human resources from its universities to drive economic growths? Indeed, such economic trajectories known for the African continent should also be an awakened call for guidance and school counsellors to 'come to the table' at high-profile conferences to deliberate ways forward for career aspirations, choice, and development for employment creation and skills development.

Industry and higher education watch scholars even painted a sad picture of African education by describing the problematic approach to countries where emphasis

is placed on “academic studies for economic and personal rewards” (Mncayi & Dunga, 2016, p. 413). Employing descriptive statistics, Mncayi and Dunga established a relationship between career choice and length of graduated unemployment in a South African university, with a commerce degree (53%) constituting the highest group, followed by the humanities (25%). Such developments on unemployment pose a challenge to career development experts, who need to consider alternative sources of curriculum designs that bridge the gap between academia and industry to produce strategic entrepreneurial graduates from Africa’s institutions of higher learning. Hence, this section argues that based on developing the right attitudes, such as goal-setting, need for achievement, risk-taking, and locus of control, Ghanaian university students can use information and communication technology to create the next conglomerates of African businesses with indigenous knowledges.

Several studies have explored the personal characteristics of entrepreneurs (Bull & Willard, 1993; Matlay, 2005; Kuenyehia, 2012; Geldhof et al., 2014) in a scientific approach to understanding and predicting entrepreneurs’ career choices in society. Matlay has established that individuals who choose careers such as managerial and entrepreneurship tend to share personal motives related to the need for change, personal freedom, challenge, and risk-taking. Schein (1985) submits that people choose their careers based on self-perceived talents, motives, and values. Empirical findings believe entrepreneurs have unique abilities to identify opportunities, start up and maintain business enterprises, and continue to innovate during turbulent times (Rezaei, Hogan, O’Reilly, Cleary, & Murphy, 2014).

Despite several traits and factor approaches to predicting entrepreneurial career choice, motivational-based characteristics dominate the research literature. Indeed, career development has significantly benefited from pioneering works in vocational

psychology using trait and factor theory (Patton & McMahon, 2014). The primary focus of the trait and factor theory of career assumes that individuals possess unique traits that can be assessed objectively and matched against the conditions of occupations (Zunker, 2011). Therefore, the current discussion examines the linear relationship between students' cognitive traits and their levels of entrepreneurial career development amongst Ghanaian public university students (findings from Hypothesis 1).

Five social-cognitive traits were used as covariates (regressed) with students' entrepreneurial career choices, which were segregated into Level 1 (*low*) and who barely considered entrepreneurial careers. Level 2 (*moderately*) and Level 3 (*highly planned behaviour*) were the experimental effects while maintaining technology integration literacy in the MANCOVA model. Ajzen's (1991) theory of planned behaviour (TPB) was used as a theoretical model to measure students' entrepreneurial intentions. Ajzen proposes that intentions are motivational drivers that guide an individual's actions and thoughts. By extension, motivations could be hierarchical, where some individuals exhibit more behavioural traits than others. Hence, this study aims to group students' ability to engage in entrepreneurial career activities whilst in school at three levels (*Low, Moderate, and High*).

Indeed, the multiple traits associated with entrepreneurs aptly justified the multivariate approach for this study. In addition to Ajzen's (1991) TPB of motivational behaviour, this study used five cognitive factors to account for students' tendency to believe in their mentality to enforce a can-do spirit' needed for individuals to create newness and champion innovation in diverse fields. Based on Jain's view, multivariate tools were used to account for multiple factors gaining currency in the entrepreneurship analysis (Jain, Ali, & Kamble, 2015).

The outcome of Hypothesis 1 showed a significant association between the levels of students' entrepreneurship intentions and their cognitive traits in support of recent works on motivational traits of a need for achievement, locus of control, and risk-taking as essential determinants of individuals' decisions to become self-employed (Korunka, Frank, Lueger, & Muglar, 2003). Similarly, the current findings from *H₀₁* cohere with the widespread belief that one's level of motivation and multiple skills might predict an entrepreneurial career (Lazear, 2002). Jain, Ali, and Kamble (2015) investigated six cognitive predictors, such as risk-taking intention, achievement motivation, market orientation, locus of control, proactiveness, and innovativeness, to account for owner-managers and entrepreneurs' intentions.

Consequently, the current study extends knowledge on cognitive predictors that significantly explained 85.2% of error variances in students' levels of entrepreneurial decision-making in the Ghanaian context using multivariate techniques (Table 15). Also, the study attempted to shed new light on the developmental stages (*Low*, *Moderate*, and *High*) of entrepreneurial career levels, which previous studies probably did not consider (Weiner et al., 2014). For instance, others submit that establishing goals is the surest way for individuals to carve a niche or role in life (Hill et al. 2011). By extension, Hill et al.'s view raises a concern for Ghanaian graduates leaving school with several choices as to what careers they would pursue in the knowledge economy.

Despite the criticisms against the traits and factor approach to profiling entrepreneurs' careers (Bird, 1995; Low & MacMillan, 1988; Gartner, 1988), others strongly support the position that intention study remains the most scientific approach to identifying entrepreneurs (Geldhof et al., 2014; Weiner, Geldhof, & Lerner, 2014). Significant others disagree that there is no such thing as a typical entrepreneur; entrepreneurship study is dominantly interested in individuals who can foster newness

that improves their economic lives (Bull & Willard (1993). Undoubtedly, the position of Bull and Willard affirms the current study's view that entrepreneurship study should be taken a step higher by career counsellors to examine potential students who can use their cognition to tap opportunities around them and generate wealth as a means of job creation. Such an approach would be a departure from the extant literature on entrepreneurs in the Ghanaian context that seems to focus on successful stories instead (*see* Kuenyehia, 2012).

Therefore, the current study further interrogates Hypothesis 1 findings using indigenous knowledges that explored the issues of entrepreneurial career choice in the Ghanaian context. Using indigeneity and facilitating frameworks for entrepreneurship intention is a departure from engaging the current subject of entrepreneurship from the Western academy. The current discussion attempts to provide a premise that aligns with the view that today's knowledge society offers Ghanaian students a much brighter opportunity for wealth creation if only they would deploy their cognitive traits to generate newness as a potent antidote to the escalating graduate unemployment. Hence, the thesis statement of this dissertation asserts that the knowledge society is driven by creative, destructive brains wired to process innovative thoughts emanating from a disequilibrium state, which eventually might generate newness for businesses, society, and self with technology integration logic frameworks to tackle graduate employability. Thus, the thesis statement forms the intellectual puzzle this study has unravelled.

The doyens of Africanism have often argued that Africa must adopt its cultural practices to develop unique knowledge systems in the academy (Asante, 1995; Anguala, 2008; Dei, 2012). In a much-cited work of the luminary giant's definitions and lamentations about the misplaced position of Pan-Africanism, Asante (1995) advances the position that:

Afrocentricity seeks to re-locate the African person as an agent in human history to eliminate the illusion of the fringes. For the past five hundred years, Africans have been taken off cultural, economic, religious, political, and social terms and have existed primarily on the periphery of Europe. Because of this existence, we have often participated in anti-African racism born of the same Western triumphalism that has entrapped our minds in the West. We know little about our classical heritage and nothing about our contributions to world knowledge. To say that we are decentred means that we have lost our cultural footing and become dis-located and dis-oriented, other than our cultural and political origins. We are essentially insane, that is, living an absurdity from which we will never be able to free our minds until we return to the source (p.1).

Asante's (1995) position on African consciousness sadly exists with us today.

Perhaps the thinking that Africans live on the fringes of Western triumphalism that has entrapped our minds exists today. In an FGD on the theme of indignity, a female final-year student in human resource management collaborated with Asante's views that;

Let us take [Apostle] Kojo Sarfo (a Ghanaian industrialist and philanthropist); he has come out with so many products, but the perception majority of Ghanaians have about his products [sic] because it is affecting the Ghanaian products is why we are not able to go higher [develop]. If he [Apostle Kojo Sarfo] is to be a foreigner outside this country, his products will be considered more quality. Because he is a Ghanaian, even when his product is up, people will look down upon the product and will not have a good image of the products.
[Rita]

The discussant's view illuminates the political opinions of luminaries such as Kwame Nkrumah, who cautions Africans against neo-colonialism as a subtle form of economic, political, scientific, and cultural enslavement (Asante, 1995). Nkrumah feared the new form of colonisation that needed to be fought mentally and not through jungle warfare. Sharing the philosophical position of Nkrumah on neo-political dominance through mental emancipation, some project Africanism as an embodiment

of a rich heritage and can only be understood and lived by the Africans themselves first if Africans have to mitigate the global economic crisis (Anguala, 2008).

However, the continuous discounted approach to the underestimation of Indigenous research pieces of knowledges continues to put Africa at a disadvantage in exploring its own human and natural resources (Hountondji, 1997). Similarly, others believe that until African consciousness is rooted within the psyche of scholars of the land (Mkabela, 2005), one symposium to another may not provide the needed solutions to Africa's poverty, malnutrition, deprivation, abuse, illiteracy, and economic emancipation. In addition, this study investigates the quick move to adopt knowledge from the Western world as a panacea for Africa's woes. A comparative analysis of global issues and knowledge systems should not be discouraged. Perhaps a holistic approach to adopting best practices for Africa has always been blamed for failures in many policy interventions and proposals for eradicating poverty from the land.

Group and personal reflections from students' FGDs in this study seemed to have ignited some curiosity. Students were observed discussing problems confronting Ghanaian Indigenous businesses without identifying creative opportunities they would explore after school. Entrepreneurship is about taking advantage of disequilibrium situations and creating opportunities. This curiosity led the study to doubt the entrepreneurial minds of the discussants in identifying disequilibrium in society and designing creative solutions to solve problems in the African context without reliance on foreign ideologies. Evidently, 91% (n = 10) of the discussants chose foreign-owned companies as their destination of work after graduation.

Consequently, using Asante's (1995) theory of Africanism, the current study recognises the attempt to interpret the findings solely using Eurocentric models, which can be an attempt to evade contextual issues such as the psychological traits likely to

spur students' entrepreneurship initiatives. Such psychological problems might be firmly grounded in the indigenous knowledge system of the local people. For instance, the study established that students' scores on equality of mean variance for the self-efficacy covariates at the data exploration stage (see Section 3.8) posed a challenge for participants in the current study. Perhaps the self-efficacy construct varied for the samples in the study.

Correspondingly, the lack of statistical predictive power ($F(2) = .61, p > .05$) for students' grit goal-setting construct on entrepreneurship propensity levels for the current study also stimulates discussion on exploring the psychology of the Ghanaian youth. This is a further illustration of the lack of consistency in the application of psychological constructs with foreign origins to Ghanaian society. Perhaps Ghanaian student is not taught to set systematic goals for their career; hence, the problem witnessed in the current study. The inability to set goals could also be explained by the support services offered to Ghanaian university students. Even though counselling centres exist in Ghanaian public universities, their proprieties in supporting their students are questioned by the findings in Hypothesis 1. The lack of a vibrant curriculum guiding counselling services in Ghanaian public universities could result in a student's inability to engage in active goal-setting in this study.

Based on the cognitive and Africanist theories, the current study also suggests that whilst Ghanaian business students are guided to relate theory to practice by using Indigenous knowledges, they should also be assisted to develop the concept of future orientations guided by rigorous goal-setting, calculated risk-taking, passion for achieving greatness, and be self-efficacious. Anecdotal reports generated from students' FGDs demonstrated a lack of belief in themselves and the craze for Eurocentrism. Interestingly, the student who indicated to work with an indigenous firm

is a male human resource student with an interest in computer software engineering.

Two male students from the human resource management department shared their views on the cognitive traits of Ghanaians on Indigenous goods and services, "... *that [mentality of the Ghanaian that what comes from outside is better than what we have here] is inferiority complex. We don't have trust in ourselves and always think that the white man is always superior.*" [Rahman]. Ike concludes, "*We despise ourselves.*" The current study reports that over 85% of factors explaining students' intentions to pursue entrepreneurship are from their motivational attributes. Hence, entrepreneurship education in Ghanaian universities should consider re-aligning the youth's perception of indigenous resources for wealth creation.

5.2 Psychoanalysts' Views on Entrepreneurship Development

Several academics have argued that the role of environmental and personal factors in promoting entrepreneurship awareness cannot be ignored (Nicolaou et al., 2008; Thompson, 2009; Summers, 2000; Segal, Borgia, & Schoenfeld, 2005; 2005; Lazear, 2005). A strong case of tolerance ambiguity, self-confidence, risky behaviours, political and capital availability, gender, age, education, and social constructs have been identified as significant predictors of entrepreneurial traits (Summers, 2000). Motivational dimensions (Segal, Borgia, & Schoenfeld, 2005) and attitudes of students leaving school with multiple competencies are found to have influenced Stanford University graduate entrepreneurship intentions by the time they obtained jobs (Lazear, 2005).

Using the traits approach to understand the predictive factors for entrepreneurs; others also believe that nature and nurture debates play a significant role in identifying different behavioural characteristics, such as entrepreneurship and aggression in society. According to biological and social psychologists, the nature vs. nurture

argument represents a profound interaction of genetic dispositions environmental, and social constructs (Kassin, Fein, & Markus, 2011: 454). Echoing the pervasive nature of the debate, Huffman (2010) elaborated on its meaning that humans are innately controlled by biological and genetic factors (nature) or by environmental learning (nurture). Huffman shared numerous empirical studies that linked culture, education, genes, brain damage, and body chemicals to aggression. From the foregoing discussions, behavioural scientists often combined biological and social constructivists' approaches to the nature vs. nurture debate to predict human behaviour. Similarly, counselling theories such as psychoanalysis, Adlerian's family constellations, Gestalt psychology, and group counselling theories of personality underpin the interpretation of demographic variables in Hypotheses 2 and 3 in the current study.

In entrepreneurship, researchers continue to investigate the roles of personal and environmental factors likely to influence intentions, such as students' workshop attendance, networking with extant entrepreneurs, and innovative-driven lectures amongst university students (Fueglistaller & Zellweger, 2011). Therefore, the current study explored the interaction of personal and institutional variates of students' stages and technology integration literacy in search for predictive variates of entrepreneurship propensity amongst Ghanaian public university students.

Using MDA techniques, the findings revealed that students' traits (parenting style, sex, and birth order) were significant predictors of business students' entrepreneurship propensity. In addition, leadership roles and entrepreneurship seminars attended were statistically associated with entrepreneurship propensity levels in this study. Curiously, one-third (220) of this study's samples ($n = 709$) showed a two-way interaction effect on the discriminatory test predicting personal and institutional variables. Specifically, over 200 samples (Tables 19 to 22) were good-fits for the

interactive impact on the multiple discriminant (MDA) model. In other words, not all students in the study were interested in extra-curricular activities or entrepreneurship thinking while in school. For instance, MDA results in Table 20 show that gender vs. birth order and gender vs. parenting style were significant combinations for predicting the students' entrepreneurship categories in this study.

Both findings reported under Hypothesis 2 have significant implications for career choice and development, entrepreneurship education, curriculum design, and family counselling practices (parenting) geared towards child development. In guidance and counselling (as mentioned earlier in this section), the statistical significance of gender, birth order, and parenting style as valuable demographic traits for entrepreneurship development stages can also be interrogated within psychoanalytic personality theories. For instance, the Freudian level of consciousness (the conscious, preconscious, and unconscious) directly relates to awareness creation for one's behaviour emanating from memories of events and experiences easily retrievable with minimal effort (Sharf, 2012). Therefore, respondents' attempts to recall their entrepreneurial awareness might be associated with their childhood experiences. Sigmund Freud emphasised humans' use of several defensive mechanisms to protect and function in society according to the structure of one's personality (id, ego, and superego).

Though Freud's psychosocial stages of development failed to account for adulthood activities, the average age of students in this study, mostly between 20 and 24 (Figure 2), offers rich insight into exploring adolescents' gender, birth order and parenting style in relation with entrepreneurship development, where students activities could be located within '*latency and genital stages*'. Whilst some students might direct their energies to extra-curricular activities upon resolving their sexual fixations and

suppressing libido according to Freud, Ego psychologists such as Erik Erikson's '*identity versus confusion*' stages of adolescence development could also be significant in the interpretations of Hypothesis 2 in the current study.

According to Erikson's psychosocial development, the fourth stage is called '*identity versus confusion*', where adolescents are likely to develop self-confidence and set educational and career goals whilst dealing with unresolved issues regarding the meaning of life (Sharf, 2012, p. 40). Indeed, career goal setting is also within the cognitive frameworks that underpin the current study (Hypothesis 1 referred). Nonetheless, Erikson warns that if such confusions are unresolved, adolescents become fixated on trust and interpersonal relationships (Erikson, 1950). Other psychology writers label the fourth stage as a potential problem hotspot involving carefree, irresponsible, and impulsive attitudes and behaviours from childhood (Plotnik & Kouyoumdjian, 2011, p. 393).

Hence, students who scored high on entrepreneurship levels with successful parenting styles that managed their role confusion might have passed this study's '*identity versus confusion*' developmental stages. Psychoanalytic counsellors could adopt parenting techniques that support the resolution of unconscious confusion for entrepreneurial competency development by students in the Ghanaian setting. Perhaps, with further documentation on Ghanaian parenting roles and cultural norms, we can integrate Erik's adolescence developmental stage with strong Ghanaian cultural values of attachment and social curriculum as a unique Africanist model of children's education articulated by Nsamenang and Tchombe (2011). Indeed, similar Africanists (Asante, 1995; Anguala, 2008; Dei, 2012) advocate for rich indigenous knowledge as a surest bet for Africa's growth instead of living someone else's life.

Another implication for Hypothesis 2's finding on birth order, and Alfred Adler's birth order characteristics can explain gender. According to Adlerians, individuals' fixation resolutions are based on a holistic approach to successful social interactions and goal direction (as seen in Erikson's 4th developmental stage) with responsibility for their fate (Griffith & Graham, 2004; Sweeney, 2009). In the assessment and analysis of cases in Adlerian psychotherapy, some equally advocate critical evaluation of individuals' lifestyles, including family dynamics and constellations (Oberst & Stewart, 2003), early recollections, dreams, and basic mistakes for rich insight and interpretation (Sharf, 2012, pp. 132-137). Adlerian counsellors contend that the family is a symbolic interaction between the individual and society— a place for cultivating, experiencing frustration, and thwarting social interest.

Consequently, experiences of gender roles by boys and girls could significantly predict students' entrepreneurial competency in Ghanaian culture. Because of the high prestige accorded to the male gender in most Ghanaian homes, the girl child might suffer early family fixations that will likely affect her goal-setting, self-esteem, self-efficacy, and need for achievement. However, such discriminatory practices might improve with education due to several affirmative action policies geared towards increasing girls' enrolment in Ghanaian public universities today.

Correspondingly, guidance and counselling sessions and career choice services could account for thick descriptions (analysis) of students' early lifestyles that might inhibit the propensity to develop entrepreneurial traits in Ghanaian public universities. Qualitative narratives from clients' (students') family history, birth order, and socialisation processes in some Ghanaian homes and societies are examples of exploring hidden frustrations that might hinder students' career potential in entrepreneurship. Though not the direct subject of investigation, the current study

recommends school counsellors use qualitative software analysis packages such as TMATLAS.ti and TMNvivo during therapeutic assessments to examine rich data with appropriate themes generated for practical counselling sessions, given the growing student numbers in Ghanaian public universities.

Examining the facilitating conditions for developing entrepreneurial traits in Ghanaian public universities, this study used Ajzen's (2005) Theory of Planned Behaviour as both focal and background theories to understand the individual's role in engaging with motives that guide them towards career choices in tandem with parenting style and gender role as well. Authoritative parenting could affect a child with inquisitiveness, limiting their options during the formative stages. Secondly, to promote entrepreneurial behaviours amongst students, guidance and counselling directorates in our universities should create more awareness of the benefits for all students to participate actively in extra-curricular activities. Such participation could assist them in developing the much-needed social capital, building competitive networks with diverse groups, and supporting them in developing social skills and communication abilities geared towards 21st-century skills and lifelong learning opportunities.

However, the regulatory framework of a country (taxes, regulations, and confidence in public institutions) that affects entrepreneurial activity, such as public policies, can either enhance or curtail entrepreneurial activity (Kristiansen, 2001). Kristiansen's views correlate with satisfaction with public institutions and the likelihood of starting a business. On the other hand, the perception of corruption dampens the intent to start a business (Badal, 2010, p. 8). Perhaps the role of government should be to provide infrastructure and enable policies to support Ghanaian youth in establishing their businesses and avoiding the menace of graduate unemployment.

5.3 Existentialism, Gender, and ICTs in Knowledge-Economy

Another functional counselling theory that underpins the discussions of Hypothesis 4 (gender and technology integration literacy) in this study is the *existential personality theory*, originally from the works of European philosophers such as Soren Kierkegaard, a Danish (Sharf, 2012). According to Sharf, the basic assumptions of the existential theory as applied to psychotherapeutics emphasise the core belief that in an attempt to overcome frustration in life, individuals must constantly manage the kaleidoscopic nature of today's world, posing unpredictability for policy and decision-making. Extending the hypothesis of existential psychology, Sharf points out that variables such as time (past and future, particularly the *present*) and an individual's life patterns are significant in understanding one's world. Sadly, an individual might experience anxiety as a result of ambiguity between faulty choices made in the real world that violate self-constructs such as gender, beliefs, and family values. Boss (1977) calls managing anxiety a distinguishing feature separating humans from other species with the unique capability to think and reflect on events and attribute meanings to them (initially referred to as '*Dasein*' or *being-in-the-world*).

Today, several technology geeks have described the knowledge society in various terms. For instance, whilst others describe emerging businesses as 'digital firms' (Laudon & Laudon, 2007), others allude to the catalytic transformation computer technologies bring to our world with a label, 'a game changer' (Oblinger, 2012). Undoubtedly, such changes in the knowledge economy present constellations to educational institutions and today's graduates in the labour market. As employers and civil society organisations (IMANI Ghana, 2013) bemoan the employability of graduates (Abu, 2012; Aryeetey & Baah-Boateng, 2007; McCown, 2015; Ananga & Anapey, 2015), higher education institutions have an arduous task to design curriculum

that accounts for exigencies of the time, whilst retaining its relevance as the agent of social change.

To measure business students' preparedness to compete on the global stage using technology and their cognitive traits, the study used goal-setting, self-efficacy, and stages of technology adoption as predictors in a *probit* model for categorising gender in the current study. Statistically, the overall model shows that only 3% of variances in the gender roles are explained based on the goal-setting construct. Statistically, males and students did not differ in the current study's technology adoption and self-efficacy stages. A possible reason behind business students' perceptions of their technology adoption stages appearing to have no significant relationship with gender may be their lack of technical knowledge and skills needed for effective technology integration into their learning, as pointed out during the FGDs sessions. On students' knowledge of multimedia content production and using computers to simulate business processes as graduating students, Mark, a human resource student interested in software engineering, remarked, *"Agreeably, lecturers are struggling to learn ICT tools for their works. If students like you have to depend on them [lecturer] for your ICT competency development, you will be in trouble."* Mark's view probably confirms earlier empirical work by Yidana (2007), which examines faculty teacher perceptions of ICT integration into instructional deliveries in two public teacher universities and concluded that 9.9 % of university teachers are innovators (stage 6) with as much as 55.7% occupying the non-adopter states of technology usage based on Hall and Hord's (1987) Concerns-Based Adoption Model (CBAM). Unfortunately, Yidana's samples included young ICT teachers who taught students ICT skills. That implies that even the below 10% innovators in the two teacher universities might consist of such young

talents. Hence, the issue of technology integration into teaching and learning for students could still be a mirage in Ghanaian universities.

Such low technology integration into students' curricula has implications for the employability and inclusiveness of Ghanaian university graduates. The employability question is based on McCown's (2015) lamentation on a five-country report on the employability of African graduates and questions: how employable are Africa's university students in their own countries? Information and communication technology is a game changer for higher education in the knowledge economy, with astonishing economic growth for nations and individuals (Oblinger, 2012, p. 37). Following testimonies from employers who emotionally state that employees coming to their workplaces sadly face challenges that are more complex than in the past, Humphreys (2012) offers solutions to higher educational institutions to increase the competitive advantages of their students with the potential of IT as instructional delivery tools. She admonished academics to innovate ways of integrating technology into education by enriching students' content knowledge more efficiently and building a community of learners who use ICTs to work collaboratively whilst constructing their own learning experiences (Shelly et al., 2006) to cross the digital divide (Agee & Holsisky, 2003). How can the Ghanaian business student take advantage of such laudable recommendations by Humphreys to model indigenous business processes as well? Perhaps faculty technology integration literacy should be purposefully engaged for lecturers. Besides, facilitating conditions support educational technology. Innovations (Ely, 1999) in higher education should be examined using a value chain analysis approach to online instruction (Elloumi, 2004).

Indeed, businesses today are described as digital firms whose operations are engineered by wired technologies and network computers (Laudon & Laudon, 2007).

Ghanaian companies today are increasingly integrating technologies into their operations. Therefore, business students entering the job market need vocational training in ICTs to adapt to their prospective employment. Besides, entrepreneurship is closely linked to technological innovations that create newness in the workplace. Therefore, computer integration competencies have become more pressing than many other skills required of graduate employability today. Thankfully, the current study did not identify gender gaps in ICT usage. Therefore, universities should encourage their faculties to develop their integration literacies to help students acquire 21st-century skills and become lifelong learners through the power of the Internet (Kerry et al., 2000). Kerry et al.'s bipartisan congressional report on *The Power of The Internet for Teaching and Learning: Moving from Promise to Practice* also recommends that for students to learn with the technologies, convenient and affordable access is more important for online content processing and sharing. Thus, Ghanaian universities' focus on improving IT infrastructure is key in deploying technologies for teaching and learning. The lack of computers in students' classrooms in today's higher education could be dangerous for Ghanaian students, as the contents seem limited to what the teacher can provide. Today, rich online books are available on diverse repositories hosted by university electronic libraries, Open Educational Resources (OERs), Google, and other electronic sources. However, without access, sources of such content remain a mirage for the 21st-century scholar. As Ghanaian universities also seek to adopt technology for teaching and learning, the issue of access must be expanded to include an overall assessment of faculty members' technical knowledge in ICT integration literacy by examining the online teaching and learning value chain (Elloumi, 2004) for intuitions. To avoid student's perceptions such as that of Mark, Yidana recommends continuous faculty

professional development where teachers continuously invest resources in IT training and application of such training into teaching and learning to build unique learning experiences for students who can face their worlds with IT tools for work and creating innovation in business modelling as well.

Besides access, teachers should revolutionise their pedagogy by building multimedia content for students using interactivity. The deployment of digital technologies into teaching and learning has dramatically challenged the mortar and brick school settings where linear instructions are delivered to learners in a unidirectional way, with the teacher being the ‘sage on the stage’. Interactivity involves hypermedia to connect learners to multiple sources of knowledge whilst constructing their knowledge (Shelly et al., 2006).

Teachers must consult the scientific literature in their fields as guides and science from behavioural and cognitive psychology to guide decisions and tailor instructions to different content, learners, and environments (Moore, 2009). Such diversity needs can be of value to Ghanaian educationists with authentic learning experiences where learners assume learner-centred roles and the teacher becomes the coach on the fringe with a guidance role. Undoubtedly, digital technologies can support students' creative thinking as lecturers design learning tasks with constructivist'' approaches where students create and share their content, which can be fulfilling. In addition, using computers for business education can enable students to simulate models using electronic spreadsheets for financial data analysis. With spreadsheets, business students can become strategic managers with what-if-analysis functions for scenario planning, high-frequency data processing and reporting, and influencing their world with hypermedia in business communications.

Perhaps such creative initiatives are the surest sources for our learners to take

giant leaps into the knowledge economy characterised by the constant transmittal of information. Regrettably, Ghanaian university graduates could be left behind in the world of fast innovations, with computers constantly changing the face of fast-changing business processes and those that cannot adapt and innovate face extinction (Thompson Jr. et al., 2005). Such a creation process is what the doyens of entrepreneurship refer to as creative destruction (Schumpeter, 1934; Drucker, 1985). Still, the role of technology in entrepreneurship thinking is supported by an observation made by Schumpeterian's model of entrepreneurship, which hinges on societal innovation and would be a failure without technological entrepreneurship (Francoise & Janviere, 2016). Earlier, others believed that constant disruption, high volatility, and increasing diversity have come to dominate market indices in many countries' formal and informal businesses (Chiles et al., 2010). To Ács et al. (2015), the merger of innovation and entrepreneurship is the antidote to youth unemployment in the knowledge society. However, Drucker (1985) draws a parallel between knowledge-based innovation and other forms of innovation and suggests that time is essential to develop knowledge into products and services based on research and technological adaptations. Drucker's views affect the current finding on students' self-efficacy and technology to generate the following business ideas for Ghanaian businesses in the knowledge society that requires innovative workers.

Hansemark (1997) also adds that skyrocketing unemployment rates might motivate individuals to commence their enterprises through entrepreneurial activities. The role of cognition in entrepreneurship drive has been empirically established. Therefore, the present discussions confidently seem to support the thesis statement of this study, which is that entrepreneurship-training initiatives that focus on developing graduates' cognitive powers and improving their learning experiences with ICT

integration literacy can be leveraged to tackle unemployment in Ghana. Therefore, educational policymakers and implementers could support ICT's integration into business students' curriculum to equip them for the competitive job markets to increase productivity and expand public and private businesses through value creation. Finally, counsellors' deployment of existentialist personality theories could significantly contribute to bridging the gender gap in technology skills for college graduates.

5.4 Career Development Implications of the Study

Though some career experts lament the paucity of literature on family influence on young adults' career development, they added that any such findings should be interpreted with caution due to a lack of generalisability by career practitioners (Huges & Thomas, 2003). They said that career practitioners should consider family relationship variables and actively solicit parental involvement in adolescents' development. This segment shares some implications of key findings in this dissertation for career development practitioners on parenting style and family constellations of Alfred Adler (Sharf, 2012).

Whilst vocational guidance mainly focuses on understanding individual differences in career choices and development (Patton & McMahon, 2014), school counsellors are interested in helping students choose appropriate jobs and academic work (Sharf, 2012). Therefore, the current study has practical significance for diverse professionals interested in developing human capital for today's knowledge economy. In this light, the study raises debates for academics and career counsellors in schools within the context of changing demographics and social and organisational changes (Collin & Watts, 1996; Peavy, 1997; Santos, 2004) that characterised the global economy. The following assumptions are shared as a guide for school counsellors, group counselling sessions, employee counselling in organisations, and politicians

interested in solving graduate unemployment in the 21st century:

- i. the statistically significant finding that cognitive variables in this study explained over 85% variance errors in graduates developing entrepreneurial intentions presents exciting lessons for career counsellors in academic institutions and firms. Whilst school counsellors' curriculum design needs to account for their student's cognitive skills, employee counselling initiatives could review their strategic recruitment test items to measure applicants' competencies on self-efficacy, goal-setting, economic locus of control, need for achievement, and reasonable risk-taking propensity. Perhaps organisational resourcing could see a more focused approach to recruiting value-driven employees whose cognitive development sets them up for creative thinking and generating newness for product and service delivery. Perhaps school counsellors could be armed with a much stronger arsenal to tackle career choices and developments of their students by providing counselling services that use cognitive-based theories such as goal setting to help students acquire needed entrepreneurial traits
- ii. in the views of career developers, students' demographics (personal traits) and technological innovations are significantly altering jobs, career choices, and aspirations of their stages of entrepreneurship development. Hence, the significant finding in this study is that students' sex, parenting style, and birth order were related to entrepreneurial intention and could also inform counsellors' assessment of their clients during career counselling sessions. In an attempt to discover creative minds in our universities today, school counsellors could use the current factor analysed instruments to identify students who suffered from parental abuse and help them overcome such anxieties for entrepreneurial skill acquisition
- iii. thirdly, the finding that leadership roles and entrepreneurship seminar attendance

predicted students' stages of entrepreneurship propensity also brings to focus the role of school counsellors in helping students participate in schools' extra-curricular activities. Besides, group counselling sessions or information counselling services could apply this finding to induction services for first-year students and prospective applicants to universities on how beneficial extra-curricular programmes could be to them in developing creative minds for personal and job success

- iv. entrepreneurship education can adopt a developmental model using the three stages of entrepreneurship (Figure 5). Therefore, the current study challenges the holistic approach to grouping entrepreneurship learners for instructional delivery
- v. the adoption of Westernised psychology theories for individuals and group career counselling should be approached with caution since cognitive and entrepreneurial behaviours might not be universally applicable. For instance, the reduction of questionnaire items at the pilot study stage for the current study revealed that not all indicators on technology and social-cognitive traits measured were applicable in the Ghanaian context (see Table 3).

5.5 Summary of Key Results Discussion

Several interventions have been proposed to address graduate unemployment globally. Whilst some advocated for industrial take-off (Thaief, 2015; Ács, Szerb, & Autio, 2015), others demanded universities to produce competent graduates for industries (e.g. Abu, 2012I; IMANI Ghana, 2013). Based on empirical data, the current study recommends that psychological constructs such as cognition and technology competency frameworks by career counsellors could support individuals in developing entrepreneurship traits for employment in the knowledge economy. Therefore, using self-efficacy, goal-setting, locus of control, risk-taking, need for achievement, CBAM,

and the Theory of Planned Behaviour as the conceptual framework offered guidance and counselling professionals in schools a rich knowledge for infusing Afrocentrism with Eurocentric views for managing youth employment in the knowledge economy. A host of auxiliary theories, such as sociocultural theory, trait theories of career choice, postmodernism, Afrocentrism, and diffusion of innovation theories, are employed to explain the findings in the current study. Some of the findings suggested that guidance and counselling departments, curriculum design experts, and the provision of the right environments for learning could support individuals and institutional factors in solving graduate unemployment in Ghana. Above all, the current study recognises three groups of entrepreneurship propensity- low awareness, moderate, and high – that have implications for career guidance in Ghanaian schools.



CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

6.1. Summary of the Study

Indeed, several anecdotal views exist on addressing the social menace of graduate unemployment (Todaro, 1997; Aryeetey & Baah-Boateng; Munive, 2008; AEO, 2015). While others propose a structural shift of Ghana's economy from agro-based production to manufacturing, others suggest that entrepreneurship is key to nations' economic growth (Drucker, 1985). The potential of the entrepreneurship concept as a field of academic research depicts it as an opportunity to discover, evaluate and examine new products and services production to meet market needs (Shane & Venkataraman, 2000). However, the current study argues that the emergence of the knowledge economy has necessitated exploring creative solutions for Ghanaian graduate employment by examining the cognitive and technological competencies for entrepreneurial career decision-making. It seems that entrepreneurs' cognition represents a potential and productive field of research that, to date, has received little contribution amongst academics (Sánchez et al., 2011). Consequently, the current study sought to explore technological, cognitive, and demographic variables with a multivariate approach to predict error variances in business students' levels of entrepreneurship propensity development from Ghanaian public universities with guidance and counselling considerations.

High grand theories of cognition (self-efficacy, goal-setting, locus of control, need for achievement, and risk-taking), theory of planned behaviour, critical education

theory, anti-colonial theory and the empirical literature formed the basis of the theoretical and conceptual framework that underpins the study. Based on the extant literature (Low & MacMillan, 1998; Drucker, 1985; Ajzen, 1991; (Shane & Venkataraman, 2000; Shane, 2003; Oblinger, 2012; Atef & Al-Balushi, 2014), the current study used a multi-disciplinary approach to explore entrepreneurial career intention in tandem with creating newness using appropriate technologies for value creation.

Two research questions guided the study. Research Question 1 sought to predict business students' entrepreneurship propensity, whilst Research Question 2 explored students' lived experiences on four themes (curriculum, ICT integration, pieces of Indigenous business knowledges, and entrepreneurship). Based on the two research questions, a sequential explanatory mixed method design was employed using an interview protocol (Appendix D) and a survey instrument (Appendix C). The validity and reliability of the research instruments were checked using univariate and multivariate techniques. Academic supervisors and experts in the fields of psychology, technology, and entrepreneurship helped to validate both the survey and interview schedules. Whilst checking for content, face, and construct validities, the ecological value of the survey instrument was also tested using exploratory factor analysis (EFA).

The EFA was used to determine the dominant items measuring the constructs identified in this study's theoretical and conceptual framework based on the recommendations of statisticians (Field, 2009; Cohen et al., 2007; Hair Jr. et al., 2014). Both algebraic and graphical techniques were used in the EFA for the pilot and final survey data. The discriminant function was used to inspect the *R*-matrix generated to identify coefficient values greater than .80 for multicollinearity assumption checks. Also, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy proposed by

Kaiser (1970) and Bartlett's test for sphericity (with Chi-square tests $< .05$) with eigenvalues > 1 , as well as anti-image matrix and scree plots were used in the current study. Out of the initial 158 questionnaire items measuring CSTI, SGGS, GTSE, ELCM, nAch, RTBS, and SEPM factors, the EFA method retains 68% ($n = 107$) based on 54 pilot sample data (Table 3). Consequently, the final survey data from 709 samples of business students from three public universities for the study produced an average Cronbach alpha coefficient of .90 for the seven factors. The lowest reliability value was .83 (SGGS), with SEPM showing $\alpha = .96$.

MANCOVA was used to test *Hypothesis 1* with discriminant analysis (hierarchical logistic regression and loglinear analysis) for *Hypothesis 2* and *Hypothesis 4*, respectively, using the IBM SPSS Statistics Version 23. Before the hypotheses testing, the study further explored the survey data for univariate and multivariate assumptions required for parametric and non-parametric statistics. For instance, outliers have the potential of biasing the means in relationship testing (see Figure 6) and distorting the normality (Figure 8) and linearity (Figure 9). In addition, the independence of scores, metric data, and homogeneity of error variances (Table 13) were heuristically and statistically checked in the current study. Finally, the non-dominant items on the seven metric factors explored in the pilot study formed the basis of the interview protocol that generated rich narrative data from two FGDs to answer Research Question 2 in this study. The interpretivists' data were coded using *Nvivo* Version 10 (QSR International Pty Ltd, 2009) and thematically analysed. The FGDs were organised under the participatory rural appraisal (RPA) framework that allowed group members to validate peers' views, which sometimes reflected the shared experiences of discussants. The RPA method also offers homogenous groups the freedom to express group views in a congenial atmosphere (Chambers, 1994). The

themes generated from the FGD data were described in two broad themes (*education* and *indigeneity*) with anecdotes to support the quantitative data in this study.

6.2. Key Findings

In addition to the four main hypotheses tested, several supplementary findings emerged from the multivariate data analysis techniques and the thematic analysis used in the analysis chapter (Sections 4.1.1 to 4.1.13). Some of the major findings from the study are:

- i) holding technology integration literacy factor as a covariate in the MANCOVA model, students' entrepreneurial career decision-making explains 85.2% error variances in their social-cognition traits,
- ii) the self-efficacy factor significantly predicts a 14.2% of the variance in students' levels of entrepreneurial career decision-making,
- iii) general task self-efficacy, students' grit goal-setting behaviour, economic locus of control disposition, need for achievement, and propensity to take risks are also significant predictors of the students' computer-specific technology integration literacy in this study,
- iv) students' traits are statistically significant predictors of their entrepreneurial career choices,
- v) using 2-way interaction effects, the loglinear model aptly shows that students' leadership roles and entrepreneurial seminar attendance statistically predict their stages of entrepreneurship intention,
- vi) students' stages of technology adoption, general task self-efficacy, and grit goal-setting significantly classify business graduates gender dimensions,
- vii) discussants in FGDs express concerns about their curriculum's inability to link theory to practice and not helping them engage in authentic learning

experiences, which will develop their soft skills needed for employment in the knowledge society and

viii) only 9% of student interviewees preferred to work for indigenous Ghanaian businesses as their destination of choice after graduation.

6.3. Conclusions

Analysis of students' entrepreneurial career decision-making using multivariate statistical analysis techniques and an interpretive discourse from final-year business students at Ghanaian public universities provided insights into how cognitive-based theories can help career counsellors design complex thought patterns in career development practice. Specifically, the following conclusions emerged from the study:

- i) Over 85% of solutions to Ghanaian graduates' employment in the knowledge economy might not only depend on external factors (e.g. structural transformations, capital, and economic indices) but rather their levels of mental strength (cognition) for entrepreneurial career decision-making,
- ii) the current study extends knowledge on careerists' view that entrepreneurial acumens are not universal and only a few talented and conscientious individuals have the desire for creating newness and engaging in creative solutions to solve problems. The classification scheme used to predict *low*, *moderate*, and *highly active* entrepreneurs' groupings in the study is a piece of ample evidence. Thus, different entrepreneurship propensity levels show students' competency on cognitive traits, personal and institutional factors, and technology integration literacy in the survey data analysis – using multiple discriminant analysis techniques
- iii) based on combinations of little over 200 students out of 709 samples in an interaction effect using discriminant function variates models in this study aptly

shows that personal and institutional variables confirm a long-held view that entrepreneurship thinking selectively exists for few individuals in society with unique characteristics for creativity and initiatives

- iv) critical opinions on curriculum's inability to link theory to practice and the lecturers' challenges integrating instructional technology into teaching and learning for Indigenous businesses incubation could present a challenge to Ghana's participation in the knowledge economy. Since nations' are restructuring their economies to accommodate high-frequency data processing and efficient production processes, the continuous delay in supporting instructional delivery with ICTs is likely to create skill gaps for the teeming graduates from the nations' universities who might not be able to compete with their cohorts in the global employment marketplace
- v) the lack of technology competences for would-be entrepreneurs could result in non-competitiveness of Ghanaian businesses. Today, entrepreneurs' career decision-making largely depends on digital innovations, branding, speedy service delivery, and efficient value chain management. Thus, the value chain of Ghanaian graduates business ventures might not be able to compete with their foreign counterparts

6.4. Recommendations

Based on the findings and conclusions reported in this study, some recommendations for managerial and practical significance are shared in this segment:

- i) based on the background theories such as psychoanalysis, Adlerian, and existential theories used in evaluating personal and institutional traits likely to influence entrepreneurship development in this study, it is recommended that vocational guidance and counselling should focus on students' cognitive traits

such as self-efficacy, goal-setting, needs for achievement, locus of control, and risk-taking propensity for entrepreneurship career planning in Ghanaian public universities

- ii) technology integration should be taken into account when designing curriculum for business education students in the Ghanaian public universities. Specifically, lecturers should be supported in improving their ICT skills to link curriculum to practice. This would enable students to add value to Indigenous businesses as they explore entrepreneurial activities
- iii) the psychometrics tests used to discriminate students' entrepreneurial intention levels in this study can be applied to students' employability traits by employment agencies. Similarly, students support professionals such as guidance and counselling directors, academic counsellors, and guidance initiatives tailored towards self-improvement and entrepreneurial career choice
- iv) since entrepreneurship traits do not exist for every individual in a selected population, a combination of factors to predict entrepreneurship intention should consider individuals' unique dispositions rather than an attempt to generalise the trait. Indeed, this recommendation aptly supports the argument of this thesis that stakeholders interested in solving youth unemployment could use the psychometric tests developed from the final instrument using EFA as a discriminant test for entrepreneurship vocation education and training.

6.5. Limitations of the Study

The attempt to share personal and methodological implications of this dissertation is to inform unintended bias that might cast doubt on the findings presented herein. Thus, some possible limitations associated with the methods and methodological

paradigms used – mostly from instrumentation, data analysis, and behavioural research difficulties are discussed in this section. In spite of the robust analytical models used to account for Type I and Type II errors, the large sample size (709), randomisation, matching techniques, outliers checks, and assumptions testing as recommended by statisticians (Field, 2009; Heiman, 2011; Hair Jr et al., 2014), means that replication of this study in different environments could strengthen validity and generalisations of findings. However, interpretations of the study could be considered within the following views:

- i) perceptual errors could bias attitudinal surveys like this. The study focuses on business students only, at the neglect of students from other faculties in Ghanaian public universities. The choice of public universities also ignores the choice of private universities in this study. Therefore, generalisation is limited for the selected programmes under the business schools in the randomly selected public universities. The study used cross-sectional data from final-year graduating students, thereby restricting the generalisability of findings to the population of public universities. However, any researcher that follows these methods strictly is likely to arrive at similar findings in private universities (since the pilot data was collected from a private university), with vocational counsellors drawing inferences from cognitive outcomes of students' entrepreneurial career choices
- ii) besides the nature of survey instrument used could create social desirability effect, where respondents sometimes strive for public acceptance and recognition of behaviours by providing 'seemingly acceptable' answers to survey items could not be ruled out in this study. In addition, the 125-item questionnaire (see Appendix C) could be described as long. Some respondents might decline to answer the instrument, resulting in some missing data

- iii) the current study shares in Culbertson et al.'s (2011) view that using student samples that allows for early predictability of entrepreneurial career choice, however, limits the generalisability of the findings to working adults who may be already working as entrepreneurs,
- iv) the results on students' technology integration literacy should also be interpreted within the curriculum framework designed for business education in the selected universities. A situation where students' ICT lessons are often limited to introductory and generic training at the commencing year often fails to recognise the existence of dichotomies between literacy and integration in the technology literature. Therefore, the current study should be strictly interpreted within Hall and Hord's (1987) Concern-Based Adoption Model
- v) similar to (i) above; the role of perceptual error theory on value judgements can affect the predictive values of the statistical findings in this study. For instance, primacy and recency effects are two dominant sources of errors likely to influence individuals in survey research of this nature. Maybe a recent entrepreneurship seminar or previous lessons on entrepreneurship could influence the respondents' responses on the items measuring entrepreneurship propensity. Similarly, the thoughts of leaving school and having to contend with job search or creating one themselves could have influenced their views on entrepreneurship propensity stages in this study, and
- vi) based on historical arguments that early days of vocational guidance movement was blighted by controversy on the place of self-assessment reports (Reardon, 2016); such as Holland's (1997) Hexagonal RIASEC (realistic, investigative, artistic, social, enterprising, conventional) theory is not an exception in this study. Indeed, Savickas and Baker (2005) were blunt in their criticism of self-reports

from individuals as unreliable and naïve. Therefore, the current study accepts such potential controversies that are likely to blight interpretations of findings because of using questionnaires.

6.6. Suggestions for Further Studies

A departure from a single research design, such as a cross-section survey employed in the current study, to a longitudinal research design could help explore future orientations of students' entrepreneurial career development. The current research shares the views of Lanero, Vázquez, and Aza (2016) that entrepreneurship intention studies are prevalent in the vocational literature but often neglect future activities of the studied. Therefore, a follow-up of the current study that used a multivariate technique (traditional statistical tools) with partial least squares structural equation modelling (PLS-SEM) approach could offer diagrammatic representations of latent variables, direct and indirect effects, measurement and structural models, and calculation of fit indices might advance Jain's (2011) argument to model more predictors in entrepreneurship study as well.

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LIST OF APPENDICES

Appendix A: Introductory Letter



UNIVERSITY OF EDUCATION, WINNEBA
DEPARTMENT OF PSYCHOLOGY AND EDUCATION

P. O. Box 25, Winneba, Ghana. Tel: (233-432) 20026 Ext. 123, 020-2041070

Email: psychology@uew.edu.gh

3rd February, 2016.

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

LETTER OF INTRODUCTION

We write to introduce to you, **GIDEON MENSAH ANAPEY**, the bearer of this letter who is a student in the Department of Psychology and Education of the University of Education, Winneba. He is reading Doctor of Philosophy in Guidance and Counselling with index number 9140170003.

He is conducting a research on the topic: **Technological and Cognitive Correlation of Business Students Entrepreneurial Competency in Ghana**. This is in partial fulfillment of the requirements for the award of the above mentioned degree.

He is required to administer questionnaire to help him gather data for the said research and he has chosen to do so in your outfit.

We shall be grateful if he is given permission to carry out this exercise.

Thank you.

Yours faithfully,

A handwritten signature in blue ink, appearing to read 'Stephen Antwi-Danso'.

Dr. Stephen Antwi-Danso
Ag. Head of Department

Appendix B: Participants' Consent Notices

University of Education, Winneba
Department of Psychology and Education
P. O. Box 25, Winneba

Participants Consent Form

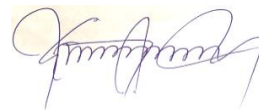
Dear Participant,

The undersigned is Ph.D candidate at the Department of Psychology and Education in above named university who is conducting study on *Ghanaian Business Students' Entrepreneurship Intent Survey*. This study is being conducted for my dissertation. It is my humble believe that the study will extend knowledge on students' stages of entrepreneurship development for guidance and counselling implications. Therefore, the candidate would be most grateful for your support in participating in this survey by responding to the questionnaire attached.

This candidate would appreciate your views on some personal characteristics and technology usage as a final year business student. This survey should take between 20 and 30 minutes (averagely) to complete. The information you will provide would be treated with confidentially, and data will be reported as an outcome of this study. Your participation is once again appreciated. However, you have the right to decline participation if you have strong reservations concerning processes involved in this study.

Thank you once again for agreeing to take part in this survey.

Gideon Mensah Anapey



(PhD Student)

Appendix C : Survey Instrument (Questionnaire)

University of Education, Winneba
Department of Psychology and Education
P. O. Box 25, Winneba
Business Students' Entrepreneurial Competency Survey

Welcome Message

Dear student, thank you for agreeing to take part in this survey. Using between 25 and 30 minutes, I would appreciate your views on technology usage, cognitive traits, and entrepreneurship as a final year business student. The information you provide here will be treated confidentially, and data would be reported as an outcome of this study. Your participation is once again appreciated. [*Gideon Mensah Anapey, PhD Student, Psychology and Education, University of Education, Winneba*]

Part A1: Curriculum-Specific Technology Integration in Business Curriculum

Instructions: Please, Tick (✓) the boxes corresponding to your degree of agreement or disagreement on your ICT use as a business student.

1. Have you taken a subject-specific ICT course in your major area such as computer applications in accounting, etc.? Yes No
2. If Yes to 1 above, which level was it taken? Level 100 Level 200
Level 300 Level 400

Part A2: Students' Stages of Technology Adoption for Business Education

Curriculum Survey Instruction: Please, read the descriptions of each of the six levels related to adoption and use of technology in business curriculum. Then tick (✓) the stage you best fit into. Please, select only one level.

Part B1: Students' General Task Self-Efficacy Scores

Please rate the extent of your agreement or disagreement on the following items on a scale of 1-5.

B2: Business Students' Goal-Setting Grit Scale

Please, rate your frequency of exhibiting the following competences as 'Almost Always' (AA = 5), 'Frequently' (F = 4), 'Sometimes' (S = 3), 'Rarely' (R = 2), 'Never' (N = 1).

Part B3: Students' Economic Locus of Control Measure

Kindly indicate your endorsement of the following items by ticking the corresponding boxes based on the rating scale: Strongly Agree (SA = 5), Agree (A = 4), Neutral (N = 3), Disagree (D = 2), Strongly Disagree (SD = 1)

Part B4: Need for Achievement and Risky Behaviours Scores

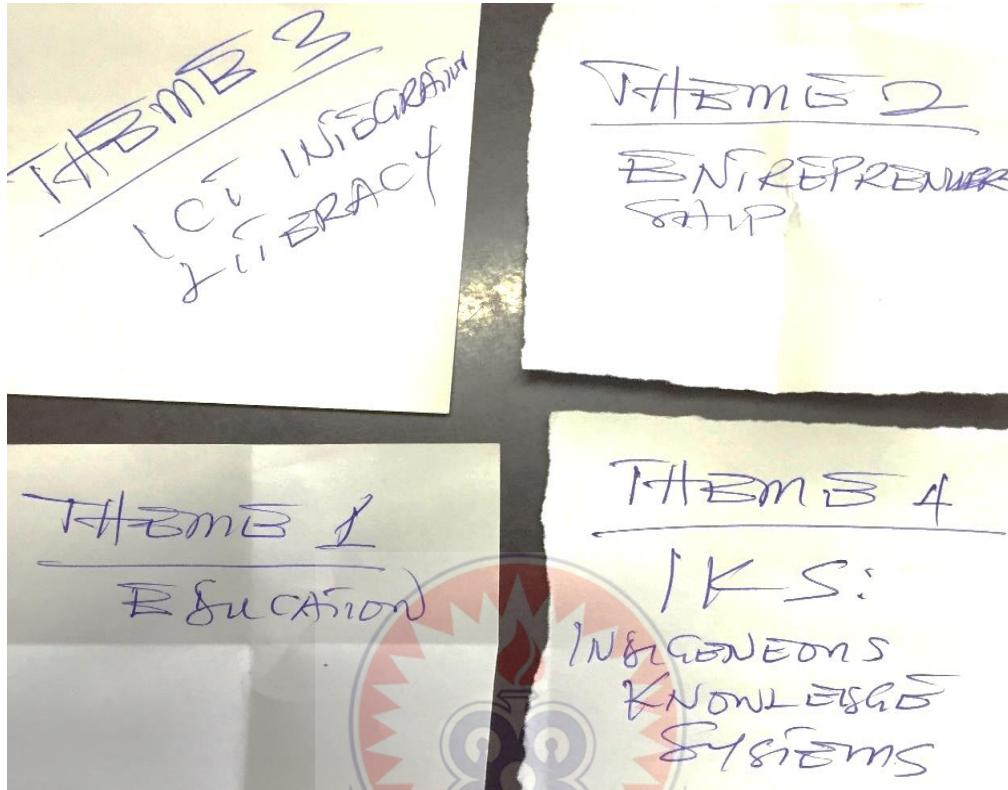
Instructions: Show the extent to which you consider each statement listed reflects your opinion/value by ticking on a rating scale: Strongly Agree (SA = 5), Agree (A = 4), Neutral (N = 3), Disagree (D = 2), strongly Disagree (SD = 1).

Part C: This segment seeks your candid opinion on entrepreneurship activities as a business student. Rate the items in this part by a tick on a scale of 1 – 6.

Part D1: Basic Demographic Information

Appendix D Focus Group Discussion Artefacts

Appendix D1: Main Themes Explored in the FGD Sessions



Appendix D2: Interview Schedules for Focus Group Discussions

Welcome Message

I warmly welcome you to this FGD session and your time and efforts are very much appreciated. I am collecting data for my doctoral study at the University of Education, Winneba, Department of Psychology, and Education. My study is focused on exploring the issues likely to influence the entrepreneurial propensity of business graduates in Ghanaian public universities. Issues such as ICT integration into the business curriculum, entrepreneurship challenges, business education curriculum, and meeting graduates expectations, and knowledge on indigenous businesses.

You are assured that comments, opinions, and discussions in this session will be handled with utmost care and confidentially. Only collective views will be reported and where individual anecdotes need to be reported, pseudo names would be used. You are most welcome.

Background Information (Please introduce yourselves for the purpose of this interview)

Name (optional)

Sex

Age (optional)

Course/Programme

Theme 1: Views on business curriculum (Education)

Theme 2: General Entrepreneurship Concepts

Theme 3: Curriculum-Specific Technology Integration in Business Curriculum

Theme 4: Indigenous knowledge systems (IKS)

Conclusion

Thank you and I appreciate your efforts in this discussion. I wish you well in your future endeavours and career aspirations.

Appendix D3: FGD Voice Data Transcription Report

INTERVIEW DATA TRANSCRIPTION REPORT												
Date	Resumption			Pausatation			HR	MIN.	HR	MIN.		
	HR	Min	MilSec	HR	Min.	miliSec						
22/5/2016	14	45	0	16	34	8			2	61		
	18	31	52	20	16	14	10 min. 12		2	51		
23/5/2016	20	10	38	20	30	14			0	30		
	4	30	25	6	7	23			2	36		
24/5/2016	4	27	51	6	29	7	29:13 min		2	33		
	10	41	27	11	29	46			1	52		
	13	34	52	15	48	24			2	49		
	20	22	40	22	42	12	1hr:07:54		2	44		
25/5/2016	6	45	18	12	49	23	1:33:33		6	57		
	16	4	12	17	54	0			1	21		
	19	34	0	23	52	21			4	57		
									24	491	8.183333	
	2	13	37						Total hour 32.18			
	1	4	56						Total Days 4			
	1	17	93	60					Recording Hours Used			
				33					Dept	HRs	min	Sec
									HRM	1	4	56
									Acc	1	17	33
									Total	2	21	89

Source: FGD data, 2016 using Nvivo™ version 8

Source: FGD data, 2016

Appendix D4: Participatory Rural Appraisal Sitting Arrangement

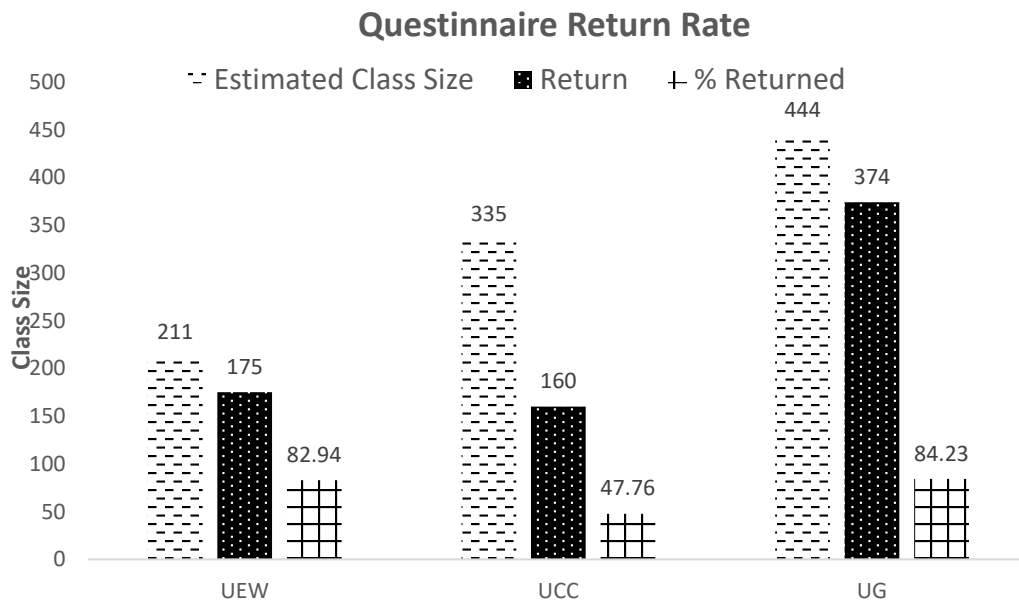


Source: FGD data, 2016

transcriptions.....



Appendix D6: Questionnaire Return Rate



Source: Survey data, 2016

Notes: Average return questionnaires (236.33) and rates of return (71.64%) are computed from the three universities data from the field.

Appendix E: Rotated Component Matrix for ELCM Measure

Items	Component								Communa lity score	
	1	2	3	4	5	6	7	8		
ELCM12	.892									.946
ELCM3	.892									.817
ELCM28	.872									.880
ELCM2	.841									.908
ELCM20	.809									.834
ELCM1	.806									.804
ELCM35	.763									.821
ELCM34	.710									.878
ELCM26	.684									.826
ELCM22	.668							.501		.815

ELCM21	.582		-.569	.844
ELCM25	.896			.907
ELCM17	.804			.897
ELCM6	.801			.904
ELCM16	.787			.916
ELCM30	.711			.823
ELCM24	.708	.504		.880
ELCM31	.655	.535		.892
ELCM23	.581			.818
ELCM29				.896
ELCM32		.934		.936
ELCM8		.821		.865
ELCM33		.815		.826
ELCM5		.662		.807
ELCM18		.658	.549	.841
ELCM7		.653		.721
ELCM4		.502		.849
ELCM37		.908		.920
ELCM36		.831		.893
ELCM14		.758		.844
ELCM13		.689		.878
ELCM15	.597	.666		.910
ELCM11		.611		.923
ELCM19			-.858	.841
ELCM27			.757	.933
ELCM9			.845	.901
ELCM10		.517	.717	.910

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 12 iterations. (see Appendix B for detailed description of items).[ELCM – economic locus of control] Source: Survey data, 2016

Appendix F: Rotated Component Matrix for Entrepreneurial Measure

Item	Component								Communality Scores
	1	2	3	4	5	6	7	8	
EPM17	.918								.898
EPM18	.918								.922
EPM35	.877								.857
EPM16	.873								.915
EPM14	.867								.869
EPM35	.862								.857
EPM12	.847								.955
EPM19	.775								.915
EPM13	.741								.833
EPM5	.639								.910
EPM6	.624								.925
EPM34	.620								.896
EPM2	.554			.544					.918
EPM31		.861							.914
EPM8		.857							.934
EPM9		.820							.894
EPM10		.731			.515				.911
EPM11		.708							.860
EPM26		.577							.912
EPM25			.867						.908
EPM21			.801						.887
EPM24			.693	.534					.931
EPM1	.535		.647						.976
EPM37				.731					.954
EPM4				.687					.909
EPM3	.556			.624					.854
EPM27			.537		.721				.902



EPM20			.676		.824
EPM28			.620		.875
EPM7			.542		.889
EPM22			.950		.978
EPM23			.873		.914
EPM30	.522	.501	.558		.903
EPM29				.719	.869
EPM33				.613	.932
EPM32				.534	.802
EPM15				.538	.902

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 12 iterations. [EPM means entrepreneurship propensity measure].

Source: Survey data, 2016



Appendix G: Curriculum-Specific Technology Integration in Business Curriculum

Rotated Component Matrix^a

		Component					
The ISTE-s for Ghanaian business curriculum		1	2	3	4	5	6
1	CSTI3 (I am able to select computer applications for learning tasks in my subject area)	0.88					
2	CSTI25 (I understand ethics involved in electronic information search and use for academic works)	0.84					
3	CSTI23 (I am able to evaluate and select digital information appropriate for my subject specialisation)	0.78		0.51			
4	CSTI11 (I am competent Identifying trends and forecasting possibilities in business with computers)	0.71				0.402	
5	CSTI7 (I understand netiquette involved using technology to communicate with global audience as a business student)		0.82				
6	CSTI22 (I can use different electronic journal databases for my academic research)		0.74				
7	CSTI19 (I am able to publish using wikis and blogs)			-		-	
		0.67		0.41			
8	CSTI27 (I have collections of my learning portfolios/business projects in electronic formats)		0.66				-
							0.45
9	CSTI26 (I can use digital media to plan and execute project-based learning)		0.63				
10	CSTI29 (Digital tools support me in lifelong learning)			0.89			
11	I often use digital calendar, reminders, and schedulers to plan my academic work)			0.84			
12	CSTI31 (Computers enable me to work in teams, learn and be productive as a student.)			0.75			
13	I have basic knowledge in troubleshooting computer systems and applications)					-	=
						0.81	
14	CSTI20 (I am able to combine, text, video, audio, and photos to create digital contents for assignment presentations)				0.81		
15	CSTI5 (I am able apply general principles in computer to learning new software)						-0.76
16	CSTI6 (I am able to identify and fix basic computer					-	-0.62

hardware and software)	0.49	
17 CSTI10 (I feel confident using computer to simulate and explore complex systems and issues in my specialised area.)		0.82
18 CSTI8 (I am able to use computer to generate original works as a means of personal or group expression)	0.46 -	0.59

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 25 iterations.

Source: Survey data, 2016



APPENDIX H: SAMPLES DESCRIPTIVE STATISTICS

H1: Descriptive Statistics of Age Indicated on the Questionnaire

	N	Range	Minimum	Maximum	Mean	SD	Variance	Kurtosis	SE
AGE	671	29	20	49	24.86	4.066	16.536	11.691	.188
VALID N (LISTWISE)	671								

Source: Survey data, 2016

H2: Item-Total Statistics for CSTI Factor

Questionnaire Items	Scale Mean if Deleted	Scale Variance if Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I am able to conceptualise (model) business processes with computer.1	35.21	54.516	.511	.305	.857
I can share files with my friends over the Internet during group/project works	34.36	54.595	.548	.444	.855
I am able to use editing features in word processors to comment on friends' assignment papers.	34.83	53.051	.571	.392	.853
I am able to send bulk letters using mail merge in word processors.	35.15	52.421	.581	.390	.852
I am able to use conferencing software (e.g. Skype) for group discussions with peers.2	35.28	51.781	.565	.359	.854
I can effectively design and present my business proposals using presentation software	35.02	51.678	.644	.450	.847
I understand netiquette involved using technology to communicate with global audience as a business student	35.26	54.131	.564	.341	.853
I am able to use office applications to present project reports.	34.89	52.073	.663	.492	.846
I can use SPSS software to organise and analyse business data	35.89	56.060	.360	.250	.868

I can effectively use Microsoft Excel for problem solving and decision-making	35.02	51.718	.685	.505	.845
I advocate and practice safe, legal and responsible use of ICT tools for education.	34.86	54.798	.504	.336	.857

Source: Survey data, 2016 [Overall Cronbach's alpha = .865]

H3: Item-Total Statistics for GTSE Factor

Questionnaire Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I always feel confident in my ability to perform well on new tasks. H	43.43	22.115	.423	.268	.572
I tend to avoid difficult situations in my life. L	44.24	23.898	.099	.105	.639
GTSES6	43.17	22.457	.266	.311	.601
I would have to practice for a long time to be able to do well on social tasks.	44.94	28.262	-.255	.196	.704
I am always active by selecting the best opportunities in my life	45.39	30.790	-.526	.339	.717
I believe in my physical capabilities to accomplish most tasks I wanted to. H	43.48	22.111	.461	.439	.568
I am able to manage difficulty situations and calm passions. H	43.51	21.797	.550	.440	.556
I have the ability to adhere to standards set for academic work in the university. H	43.46	20.847	.616	.481	.538
I always persevere on tasks till I achieve them. H	43.41	21.139	.619	.505	.541
I practice difficult tasks as often as possible till I succeed. H	43.59	21.734	.521	.389	.558
I can often see successful end to every task in engaged in. H	43.51	21.791	.520	.391	.558
I always learn from my mistakes in life. H	43.21	21.416	.537	.394	.553

On average, other individuals are probably not as capable of doing as well on learning tasks as I am. H 44.16 24.079 .149 .075 .622

Source: Survey data, 2016 [Overall Cronbach's alpha = .667]

H4: Item-Total Statistics for ELCM Factor

Questionnaire Items	Scale Mean if Deleted	Scale Variance if Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Becoming rich has little or nothing to do with chance	96.33	142.400	.016	.229	.776
Saving and careful investment is a key factor in becoming rich.	95.41	140.411	.140	.251	.767
Whether or not I become wealthy depends mostly on my ability.	95.71	136.361	.285	.296	.761
I can rarely do very much for people who are poor.	96.63	136.721	.226	.127	.764
Anyone can learn a few basic economic principles that can go a long way in preventing poverty.	95.55	141.087	.113	.197	.769
To a great extent my life is controlled by accidental happenings.	97.14	136.758	.274	.254	.762
People's poverty results from their own idleness.	96.35	135.708	.279	.217	.761
Social workers relieve or cure only a few of the financial problems their clients have.	96.09	139.421	.207	.187	.765
No matter what anyone does, there will always be poverty.	96.23	138.092	.175	.169	.767
When I make plans, I am almost certain to make them work.	95.61	139.182	.199	.265	.765
Whether or not people get rich is often a matter of chance.	96.58	135.900	.285	.373	.761
People who never become poor are just plain lucky	96.86	134.571	.356	.440	.758

There is no chance of protecting my savings from bad luck happenings.	96.88	135.748	.293	.321	.761
The seriousness of poverty is overstated	96.62	135.043	.318	.209	.759
When it comes to wealth, there is no such thing as 'bad luck'	96.48	138.295	.203	.160	.765
When I get what I want, it is usually because I am lucky.	96.88	135.316	.334	.327	.759
Relief from poverty requires good hard work more than anything else	95.77	135.973	.314	.284	.760
Although I might have the ability, I will not become better off without appealing to those in positions of power.	96.61	133.573	.393	.287	.756
Becoming rich has nothing to do with luck.	96.21	142.085	.045	.215	.773
How many friends I have depends on how generous I am	96.53	133.212	.437	.279	.754
People like me have little chance in protecting our personal interests when they are in conflict with those of strong pressure groups.	96.61	134.830	.334	.266	.759
When you are poor, there is not much you can do for yourself.	96.64	135.005	.308	.198	.760
Politicians can do very little to prevent poverty.	96.55	135.096	.272	.197	.762
If I become poor, it is usually my own fault.	96.10	132.974	.380	.326	.756
Getting what I want financially requires pleasing those people above me.	96.81	133.788	.391	.333	.756
Whether or not I get to be well off depends on whether I am lucky enough to be in the right place at the right time.	96.40	133.122	.418	.357	.755
I can pretty much determine what will happen to me financially.	96.08	138.503	.208	.239	.765
I am usually able to protect my personal interests.	95.67	139.514	.216	.328	.764

When I get what I want, it is usually because I worked hard for it.	95.69	136.566	.311	.388	.760
My life is determined by my own actions.	95.58	136.867	.304	.445	.760
It is chiefly a matter of fate whether I become rich or poor.	96.58	133.378	.363	.342	.757
Only those who inherit or win money can possibly become rich.	97.40	137.245	.224	.376	.764

Source: Survey data, 2016 [Overall Cronbach's alpha = .768]

H5: Item-Total Statistics for nAch Factor

	Scale Mean if Deleted	Scale Variance if Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Deleted
Even though people tell me it can't be done I will persist. nAch	19.88	10.904	.569	.453	.794
I look upon my works as simply a way to achieve my goals. nAch	19.68	10.973	.726	.678	.764
I will not be satisfied unless I have reached the desired level of results. nAch	19.70	11.407	.638	.575	.781
I try to do my job as well as possible even when the tasks assigned to me are difficult. nAch	20.06	10.176	.690	.511	.765
I never put important matters off until a more convenient time. nAch	20.22	11.065	.558	.398	.796
I spend a considerable amount of time making an association I belong to function better. nAch	20.38	11.966	.377	.185	.836

Source: Survey data, 2016 [Overall Cronbach's alpha = .819]

H6^b: Item-Total Statistics for RTBS Factor

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I try to do my job as well as possible even when the tasks assigned to me are difficult. nAch	7.84	2.396	.619	.405	.526
I never put important matters off until a more convenient time. nAch	8.00	2.603	.565	.366	.597
I consider security as an important element in every aspect of my life. RB	7.69	2.911	.439	.198	.745

Source: Survey data, 2016[Overall Cronbach's alpha = .798]

H7: Between-Subjects Effects for Homogeneity of Regression Slopes Test

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	GTSE	16.492 ^a	5	3.298	24.279	.000
	SGGS	9.172 ^b	5	1.834	8.086	.000
	ELCM	4.964 ^c	5	.993	6.847	.000
	nAch	27.641 ^d	5	5.528	14.008	.000
	RTBS	7.669 ^e	5	1.534	3.377	.005
Intercept	GTSE	228.620	1	228.620	1682.818	.000
	SGGS	181.039	1	181.039	798.030	.000
	ELCM	196.973	1	196.973	1358.400	.000
	nAch	274.419	1	274.419	695.340	.000
	RTBS	202.577	1	202.577	446.064	.000
SEPM Group	GTSE	1.563	2	.782	5.754	.003
	SGGS	.278	2	.139	.612	.542
	ELCM	.142	2	.071	.490	.613
	nAch	3.288	2	1.644	4.166	.016
	RTBS	.594	2	.297	.653	.521

CSTI	GTSE	9.919	1	9.919	73.008	.000
	SGGS	7.647	1	7.647	33.707	.000
	ELCM	2.224	1	2.224	15.334	.000
	nAch	12.626	1	12.626	31.993	.000
	RTBS	4.000	1	4.000	8.808	.003
SEPM Groupx CSTI	GTSE	.990	2	.495	3.642	.027
	SGGS	.528	2	.264	1.164	.313
	ELCM	.043	2	.021	.147	.863
	nAch	1.668	2	.834	2.113	.122
	RTBS	.225	2	.113	.248	.780
Error	GTSE	95.099	700	.136		
	SGGS	158.800	700	.227		
	ELCM	101.503	700	.145		
	nAch	276.258	700	.395		
	RTBS	317.900	700	.454		
Total	GTSE	9508.409	706			
	SGGS	7668.454	706			
	ELCM	6972.435	706			
	nAch	11582.039	706			
	RTBS	7777.278	706			
Corrected Total	GTSE	111.591	705			
	SGGS	167.972	705			
	ELCM	106.467	705			
	nAch	303.898	705			
	RTBS	325.568	705			

a. R Squared = .148 (Adjusted R Squared = .142)

b. R Squared = .055 (Adjusted R Squared = .048)

c. R Squared = .047 (Adjusted R Squared = .040)

d. R Squared = .091 (Adjusted R Squared = .084)

e. R Squared = .024 (Adjusted R Squared = .017)

Source: Survey data, 2016

H8 Chi-Square Tests for SEPM Level and CSTI Factors

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	206.727 ^a	110	.000
Likelihood Ratio	213.432	110	.000
Linear-by-Linear Association	7.989	1	.005
N of Valid Cases	709		

a. 122 cells (72.6%) have expected count less than 5. The minimum expected count is .15. Source: Survey data, 2016

H9: One-Way ANOVA Test for the Covariate (CSTI)

		Sum of Squares	df	Mean Square	F	Sig.	
Between Groups	(Combined)	4.356	2	2.178	4.200	.015	
	Linear Term	Unweighted	3.278	1	3.278	6.320	.012
		Weighted	4.181	1	4.181	8.061	.005
		Deviation	.175	1	.175	.338	.561
Within Groups		366.143	706	.519			
Total		370.499	708				

Source: Survey data, 2016

H10: Box's Test of Equality of Covariance Matrices^a

Box's M	64.752
F	2.129
df1	30
df2	345798.099
Sig.	.001

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + CSTI + SEPM Group

Appendix I (2): Saturated Model Goodness-of-Fit Tests for H_03

	Chi-Square	df	Sig.
Likelihood Ratio	.000	0	.
Pearson	.000	0	.
(Source: Survey data, 2016)		N = 181	

Appendix 1 (4): Hypothesis 2 Goodness-of-Fit Tests

	Chi-Square	df	Sig.
Likelihood Ratio	.000	0	.
Pearson	.000	0	.
(Source: Survey data, 2016)		N = 220	

Appendix 1 (5): Data Information for Hypothesis 3

		N
Cases	Valid	547
	Out of Range ^a	0
	Missing	162
	Weighted Valid	547
Categories	Academic Department	6
	SEPM (Binned)	3
	Number of entrepreneurship seminars attended	3

a. Cases rejected because of out of range factor values.

Appendix J (1): Omnibus Tests of Model Coefficients for SGGs Factor in the Model

		Chi-square	df	Sig.
Step 1	Step	15.862	1	.000
	Block	15.862	1	.000
	Model	15.862	1	.000

Appendix J (2): Tests of Normality for STA (Factor 2) in H_04

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Students' Stages of Technology Adoption for Business Education Curriculum	.196	670	.000	.878	670	.000

a. Lilliefors Significance Correction n = 670 Source: Survey data, 2016

Appendix J (3): Logistic Regression Sample Size Determination

Case Processing Summary

Unweighted Cases ^a		N	Percent
Selected Cases	Included in Analysis	670	94.5
	Missing Cases	39	5.5
	Total	709	100.0
Unselected Cases		0	.0
Total		709	100.0

a. If weight is in effect, see classification table for the total number of cases.

Appendix J (4): Descriptive Statistics for Birth Order Factor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	First born	179	25.2	26.6	26.6
	Middle born	169	23.8	25.1	51.6
	Last born	163	23.0	24.2	75.8
	4	94	13.3	13.9	89.8
	5	27	3.8	4.0	93.8
	6	4	.6	.6	94.4
	7	5	.7	.7	95.1
	8	1	.1	.1	95.3
	9	11	1.6	1.6	96.9
	17	2	.3	.3	97.2
	99	19	2.7	2.8	100.0
		Total	674	95.1	100.0
Missing	System	35	4.9		
Total		709	100.0		

Appendix J (5): Raw Scores for Entrepreneurship Seminars in Ho3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	131	18.5	19.3	19.3
	1	70	9.9	10.3	29.6
	2	128	18.1	18.8	48.4
	3	117	16.5	17.2	65.6
	4	89	12.6	13.1	78.7
	5	68	9.6	10.0	88.7
	6	24	3.4	3.5	92.2
	7	11	1.6	1.6	93.8
	8	9	1.3	1.3	95.1
	9	5	.7	.7	95.9
	10	12	1.7	1.8	97.6

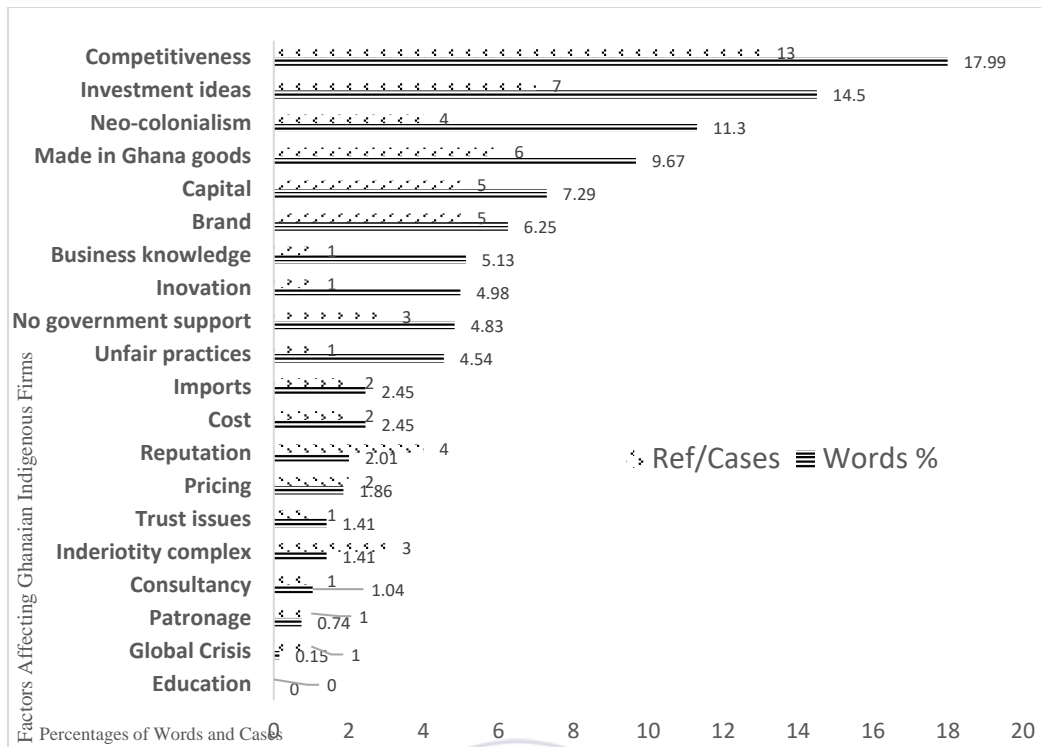
	11	1	.1	.1	97.8
	12	7	1.0	1.0	98.8
	15	5	.7	.7	99.6
	16	1	.1	.1	99.7
	21	2	.3	.3	100.0
	Total	680	95.9	100.0	
Missing	System	29	4.1		
Total		709	100.0		

Appendix J (6): Number of seminars Categorisation for H₀3

Attendants		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-3 times attendee	315	44.4	57.6	57.6
	4 to 6 times attendee	181	25.5	33.1	90.7
	7 to 21 times attendee	51	7.2	9.3	100.0
	Total	547	77.2	100.0	
Missing	System	162	22.8		
Total		709	100.0		

Appendix J (7): STA Factor Used for Ho4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Awareness	20	2.8	3.0	3.0
	Learning the process	37	5.2	5.5	8.5
	Understanding and application of the process	98	13.8	14.6	23.1
	Familiarity and confidence	140	19.7	20.9	44.0
	Adoption to other contexts	166	23.4	24.8	68.8
	Creative application to new contexts	209	29.5	31.2	100.0
	Total	670	94.5	100.0	
Missing	System	39	5.5		



Appendix J : SEPM (Binned) * University Crosstabulation

		University			Total	Total %
		UEW	UCC	UG		
SEPM (Levels)	Low	54	71	130	255	36
	Moderate	86	77	188	351	50
	High	35	12	56	103	15
Total		175	160	374	709	100

Source: Survey data, 2016

Appendix K : Hosmer and Lemeshow Test for SGGS Used to Predict Gender

Step	Chi-square	df	Sig.
1	12.435	8	.133

Source: Survey data, 2016