

UNIVERSITY OF EDUCATION, WINNEBA

**INTELLECTUAL CAPITAL AND PERFORMANCE OF PUBLIC
UNIVERSITIES IN GHANA FROM THE BALANCE SCORECARD
PERSPECTIVE**

The logo of the University of Education, Winneba, is a circular emblem. It features a central sunburst design with rays extending outwards. Below the sunburst are three interlocking circles. The entire emblem is set against a red background with a white border. A banner at the bottom of the emblem contains the motto "EDUCATION SERVICE".

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**A Dissertation in the Department of Accounting,
School of Business, submitted to the School of
Graduate Studies, in partial fulfilment
of the requirements for the award of the degree of
Master of Business Administration
(Accounting)
in the University of Education, Winneba**

JANUARY, 2023

DECLARATION

Student's Declaration

I, hereby declare that this thesis, except for quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and that it has not been submitted, either in part or whole, for another degree elsewhere.

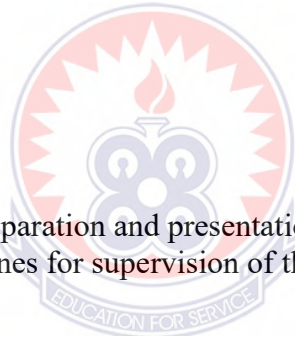
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Supervisor's Declaration

I hereby declare that the preparation and presentation of this dissertation were done in accordance with the guidelines for supervision of thesis laid down by the University of Education, Winneba.



NAME OF SUPERVISOR: SAMUEL GAMELI GADZO

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DATE:.....

DEDICATION

To my lovely mother and the entire family.



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My sincere gratitude goes to my supervisor, Samuel Gameli Gadzo who provided an invaluable assistance in guiding me through the completion of this research. I would also want to express my gratitude to my all the lecturers in the School of Business and the Head of Department of Accounting for their encouragement and support. I cannot forget to thank my respondents, family, friends and colleagues for their moral support, and all those who helped me in diverse ways to successfully complete this dissertation.



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ABBREVIATIONS

IC	Intellectual Capital
HC	Human Intellectual Capital
SC	Structural Intellectual Capital
RC	Relational Intellectual Capital
BSC	Balance Scorecard
UG	University of Ghana
UCC	University of Cape Coast
KNUST	Kwame Nkrumah University of Science and Technology
UEW	University of Education, Winneba
DC	Demographic characteristics
PBSC	Performance Measured by Balanced Scorecard
SEM	Structural Equation Model
AVE	Average Variance Extracted
PLS-SEM	Partial Least Squared Structural Equation Model

ABSTRACT

The role of Intellectual Capital in the performance and progress of universities in other parts of the world is obvious but there is little evidence in Africa. This study, therefore, investigated the relationship that exists between Intellectual Capital and the performance of public Universities in Ghana from the balanced scorecard perspective. The study employed the descriptive causal design and 178 Head of Department across public universities in Ghana were sampled using the census sampling technique for the study. The data was analyzed using Statistical Package for Social Sciences (SPSS) version 22 software and the PLS- SEMS version 4. The study revealed that with respect to human intellectual capital, the number of conferences attended by Lecturers is commendable. Also, the result showed that the indicators of the balance scored card showed that the public universities in Ghana are performing well from the perspective of all the indicators, especially the financial measures. The study also found that socioeconomic factors affect performance positively while the moderating role that socio-economic factors had a positive effect on how Intellectual Capital affects performance measured by a balanced scorecard. The study recommended that much attention should be paid to human intellectual capital and structural capital development to sustain improved growth in public universities in Ghana. Finally, the study recommended that the level of education and other socio-economic factors should be improved since they directly affect the intellectual capital which eventually affects the performance of public universities in Ghana.



CHAPTER ONE

INTRODUCTION

1.0 Overview

This introductory chapter discusses the background to the study, statement of the problem, purpose and objectives of the study and research questions. It also talks of the significance of the study, delimitations of the study, limitations of the study, and organization of the study.

1.1 Background to the study

Many Organizations for the past decades have identified two kinds of assets which are important to their performance: tangible and intangible assets. Successful companies do not gain benefits with only tangible assets but they mainly rely on access to intangible information and knowledge creation as their major resources for success (Guthrie, 2001). They rely more on skills and knowledge of the employees other than tangible assets. The traditional concept of evaluating enterprise value and performances with tangible assets has gradually given way to a focus on intangible knowledge development and integration ability. Moreover, there are other part of intangible assets which are not recorded in financial statements but constitute a high portion of the market value of the organization (Shih, Chang and Lin, 2010). To survive in a new competitive environment, organizations had to cease seeking competitive advantages in their tangible resources and rather focus on their intangible assets.

In the modern “new knowledge economy”, the concept of Intellectual Capital is synonymous with knowledge assets, intellectual assets, or intangible assets (Guthrie, 2001). Intellectual Capital combines the idea of the intellect power with the

economic concept of capital for the purpose of producing innovative or more efficient and effective goods and services. Typically, the term Intellectual Capital refers to all intangible asset which is made up of knowledge, patents and licences, skills and experience to creates higher value through competition and innovation to determine the competitiveness of an organisation (Khalique, Bontis and Shaari, 2015; Chen and Lin, 2001; Liu, Ding, Wu, Wang and Fang, 2018 and Ji, 2019). Intellectual Capital is considered a key driver for value creation and organizational development both in private and public sectors of global economy (Lev, 2001; Bezhani, 2010; Siboni, Nardo & Sangiorgi, 2013; Low, Samkin and Li, 2015).

Many contemporary Business environment such as Universities are characterized by a “high degree of intangibility” (Secundo et al., 2016) since their primary outputs are intangible services, thus creating a strong need for assessing the effects of Intellectual Capital on universities performance. The way in which performance of universities are measured is different from the performance measurement of business firms. University performance has a multidimensional nature, and its assessment requires the research of appropriate indicators and methods of measuring the components of the performance itself. Based on the performance indicators stated by the Intellectual Capital Report (2015), the universities performance is measured from three perspectives which are educational performance, research performance and transferring performance. Therefore, this study will seek to explore comparatively, the relationship that exist between Intellectual Capital and performance of public Universities in Ghana from the Balance scorecard perspective.

The idea of performance management is being advocated all around the world as a crucial instrument to increase productivity, effectiveness, and organizational response to shifting conditions and customer expectations (Halachmi, 2011). The

adoption of performance metrics including profitability, return on investment, sales growth, and cash flow especially by managers in private sector organizations in an effort to their organizations' performance. These organizational performance indicators have drawn criticism for failing to adequately capture many of the crucial success variables needed for external accountability and take into consideration the needs of internal management (Atkinson, 2006).

Concerns have been expressed about how to balance the interests of various stakeholders considering this. Performance Management Systems could include information requirements (PMSs), and how businesses might connect to or coordinate performance reports for external responsibility objectives and requirements for internal management controls (Lee, 2006). As a result, several frameworks for performance management that incorporate both financial and non-financial indicators were created with the intention of offering a multidimensional approach to controlling and measuring organizational performance. They consist of the Performance Pyramid, the Balanced Scorecard, the Performance Prism, the Performance Pyramid, and the Cambridge Performance Measurement Process (Kaplan & Norton, 1996). (Bourne, Mills, Wilcox, Neely & Platts, 2000).

In addition, Lee (2006) lists a few other frameworks, such as the Integrated Performance Measurement System, the Consistent Performance Measurement System, and the Results and Determinants Matrix. However, it has been highlighted that among these frameworks, the balanced scorecard is the most well-known (Philbin, 2011; Smith & Kim, 2005). Although there is evidence that these frameworks, particularly the balanced scorecard, have been embraced and used by several organizations to improve their performance management procedures, they have been criticized for having a bias toward the private sector and manufacturing

companies (Hussain & Hoque, 2002). However, in recent years, managers in public service organizations have come under a lot of pressure to improve the quality of their services due to developments like growing economic change, knowledge transfer, technology advancements, and increased private sector involvement in the provision of public services

So, for managers to be in a better position to ensure the successful operationalization of these institutions, it is necessary to critically examine their performance management practices from a multifaceted perspective for public and not-for-profit making organizations, such as universities, that aim to deliver quality service. According to de Waal (2007), this can be accomplished by effectively implementing a multifaceted performance management framework, like the balanced scorecard, which can meet the needs of numerous stakeholders.

1.2 Statement of the Problem

A number of methodological frameworks have been developed as well as empirical examinations on Intellectual Capital. Several studies have examined the effect of Intellectual Capital on performance of universities (Sánchez and Elena, 2006; Cricelli, Greco, Grimaldi and Dueñas, 2018; Anggraini, Abdul-Hamid and Azlina, 2018; Omowumi, 2018; Awan, and Saeed, 2014; Ramírez, Tejada and Gordillo, 2013; Barbosa, Vale, Teixeira and Branco, 2016; Zerr and and Aaqoulah, 2021 and Al-Tahat, Matarneh, and Ali, 2019) among others. Concerning the considerable significance of Intellectual Capital and performance as a cornerstone of competitive advantage, a variety of different academic fields have suggested the significant association between Intellectual Capital and performance (Grindley & Teece, 2017; Menor, Kristal, & Rosenzweig, 2017; Subramaniam & Youndt, 2015).

However, institutions still experience ineffectiveness in the utilization of Intellectual Capital (Edvinsson & Sullivan, 2016).

Most of the institutions who participated in a survey carried out by the Economist and Accenture in 2021, asserted that handling intangible resources are considered as the fundamental driver towards competitive advantage. Nonetheless, most of the managers that is 95 percent of the 120, contended that there is a total lack of a robust system in their companies to measure intellectual capital and the generated performance (Molnar, 2014). This issue in turn underlines this fact that theory and research seem to be ineffective so far in addressing how to explicate the nature of Intellectual Capital inside firms and the influence of the intangible resources on measurable performances. In effect, a precise conceptualization and definition of Intellectual Capital remains disputable despite the consensus about the importance of Intellectual Capital as a cornerstone for value creation. For instance, Hudson (2013) narrows the scope of the concept to merely individual knowledge.

The role of Intellectual Capital in the performance and progress of universities in the other parts of the world is obvious. Despite the increasing research into these relationships, there is little evidence that supports the impact of Intellectual Capital on performance in the education sector in Africa and in Ghana especially from the perspective of the balance scorecard. This study therefore seeks to investigate the relationship that exists between Intellectual Capital and performance of public Universities in Ghana from the balance scorecard perspective to redress the Intellectual Capital issue in University in Ghana.

1.3 Purpose of the Study

The purpose of this study is to explore comparatively, the relationship between intellectual capitals and performance of public Universities in Ghana from the Balance Scorecard Perspective.

1.4 Objectives of the Study

The specific objectives are to:

1. assess the intellectual capitals of public universities in Ghana
2. evaluate the performance of public universities using the Balanced scorecard.
3. estimate the effect of intellectual capitals on the performance of public Universities in Ghana using the Balanced scorecard.

1.5 Research questions

1. What are the intellectual capitals of public universities in Ghana?
2. What is the performance of public universities using the Balanced scorecard?
3. What is the effect of intellectual capitals on the performance of public Universities in Ghana using the Balanced scorecard?

1.6 Significance of the study

The findings of this study would be beneficial to the regulators and policy makers in formulating frameworks and policies for measuring, managing, and reporting Intellectual Capital information in the annual reports of Ghanaian universities in order to meet up with global and competitive challenges ahead. This study would provide valuable information to practitioners and managements of universities in Ghana on the importance of each component of Intellectual Capital to improve the effective and efficient working of universities. It would also assist policy makers and academic administrators in highlighting the combination of Intellectual

Capital that could help in achieving their academic goals and develop curriculum and training of the university's staff more properly to be more effective and efficient.

It would further assist Tertiary educational institutions on how to apply their Intellectual Capital by giving proper attention towards the management of various Intellectual Capital components to improve their performance. The result of the study would contribute to the academic field of knowledge by providing empirical evidence on the effect of Intellectual Capital on performance of tertiary education system in Africa, Ghana as most literatures on this topic focuses on the banking industry, manufacturing sector and other business sectors. The findings of the study would also serve as a body of reference for future researchers on Intellectual Capital and in the University context.

1.7 Delimitation of the study

The study is limited to Intellectual Capital that is at the disposal of only Public Universities in Ghana with the aim of assessing how it has affected the institutions performance and improve upon them using some important theoretical and empirical evidence from some selected Public Universities in Ghana. In addition, only Head of Department of the various faculties and Schools were contacted for data collection. Therefore, not all the employees and management staffs were of the selected universities were the target of interest.

1.8 Limitation of the study

The researcher encountered a few difficulties during the conduct of this study. The researcher conducted this study on only 100 Head of Departments. The sample size of was also relatively small considering the population of the Head of Departments in the public Universities in Ghana. Failure to study the entire or a large

population of the employees and management staffs in the public universities and country reduced the generalizability of the findings. Hence, the results of this study were limited to the views of Head of Departments of the public universities in Ghana. Another challenge was that it was difficult to collect data from the respondents because of the persistent strike action the universities embarked on. The researcher had to improvise with the supervisor and draft the questionnaires on google docs which is a free online document. There was also a challenge of unwillingness on the part of some of the respondents to provide the information because of their insufficient knowledge in the use of the internet to provide answers to the online questionnaires. However, the respondents were provided with a directional and graphical ways of having access to the questions online.

1.9 Organisation of the study

The dissertation has been organized into five chapters. The first chapter highlights the background of the research problem, the statement of the problem, the purpose of the study, research objectives and questions by the researcher, the significance of the study and organization of the study. Literature related to the study is reviewed in the second chapter. The review considers empirical studies, surveys, and views of other authors. The methodology and procedure adopted in carrying out the study are discussed in Chapter Three. Chapter Four presents the results and discussion of the data. The results from the primary data were presented, discussed, and analysed. The final chapter recapitulates the results and draw conclusions. Recommendations are made for the relationship between intellectual capital and performance from the balance scorecard perspective. Further research is also recommended in the final chapter

CHAPTER TWO

LITERATURE REVIEW

2.0 Overview

This chapter focused on the review of existing literatures which are relevant to the study. Generally, the literature reviewed were centered on studies associated with prevalence of diabetes in the world, in Africa and in Ghana. It also focused on the literature associated with sociocultural as well as people's perceptions of causes and consequences of type 2 diabetes. The theoretical framework which informed the study has also been discussed in this chapter.

2.1 Theoretical Review

The area of intellectual capital is deeply indebted to scholars who provide a solid base for contemporary organizational theory and the Dynamic theory of Intellectual Capital. Even though the researchers like Stewart and Ruckdeschel (2018), Edvinsson and Sullian (2016), Ittner, Larcker and Randall, (2019), and Roos and Roos (2017) endeavored to create a public awareness of the conception of "intellectual capital", their studies depend upon the analytical models of these scholars, particularly those who scrutinized how corporate knowledge is developed and utilized to enjoy competitive advantage (Siegel, 2014). It would be useful to underline some of the seminal research in organizational theory and knowledge management which lay the foundation for the field of Intellectual Capital.

2.1.1 Dynamic theory of intellectual capital

Human capital, structural capital, and customer capital are the three fundamental elements. An alternative strategy would use systems theory to replace structural capital and fully do away with customer capital. Finally, the economic

theory of human capital, which continues to serve as a significant theoretical pillar, strongly supports intellectual capital. The emphasis on the organizational structure's boundaries and the internal workings of each department was part of Stewart, Edvinsson, and Malone's definition of structural capital. Their definition also considers the ownership rights of things like innovations, technologies, and other processes that can be protected by trade laws, copyrights, or patents.

Despite Edvinsson, Malone, and Stewart's best efforts, even the title of their study still has some restrictions regarding how structural capital may be related to the entire organization. The arrangement of components and pieces in a material or body, as well as something structured in a certain pattern of organization, are all defined as structure in Webster's Dictionary (Spender, 2016). In contrast, the definition of a system is a regularly interacting or interdependent group of objects constituting a coherent whole; a network of people or organizations formed for the aim of fulfilling a common goal (Roos & Roos, 2017). An organization's definition would be more comprehensive if it used a systems theory approach rather than structural capital.

The organization can understand its interconnectedness by viewing intellectual capital through systems theory rather than structural capital. An approach based on systems theory connects the person to the procedure, then to the organization. This enables alignment to make sure that every person and procedure is related to the strategic plans and corporate objectives at the core of the firm. A systems approach, however, would continue to consider the elements that Stewart and Edvinsson included to their definitions of structural capital (Edvinsson & Malone, 2017). The organization's knowledge and the tools built to access it will become its competitive advantage in a world where intellectual capital is abundant. This would imply that those working within the company who have access to the tacit knowledge of the

customers rather than just the customers (or end users) are supporting the company and its bottom line (Stewart & Ruckdeschel 2018).

2.1.2 Contingency theory

From the contingency lens, the optimal design for an organization depends on the temperament of its operating environment (Chapman, 1997; Galbraith, 1973; Otley, 1980; Woodward, Dawson, & Wedderburn, 1965). The contingency theory regards the environment or the internal/external context of a system or an organization to strongly influence the performance and efficiency of a system. It is also assumed that there is a lack of universally applicable systems, however, the systems are expected to adapt to a specific context for it to be efficient (Schreyögg & Steinmann, 1987). The contingency-based view combines decision-based approach and system-theory. The decision-based approach is made up of a very narrow viewpoint, while system theory is highly formalistic. From this integration, the contingency theory is representative of an open system with “if then”-relationships, emphasizing relations within and around the corporation as the defined system (Lawrence, Lorsch, & Garrison, 1967).

The contingency theory is framed by the general hypothesis, stating that organizations having internal features that best match their situation-specific demands will realize the best levels of adaptation (Scott, 1967). The contingency theory is salient vis-à-vis management accounting and control system research (Fisher, 1998; Gordon & Miller, 1976; Hayes, 1977; Otley, 1980). In general, the contingency theory of management accounting assumes that there doesn't exist one single MAS which applicable to all entities. The contingency theory of management accounting attempts to show how the form of an organization's management control system is figured with special contingencies (Otley, 1980). The most suitable management

control system is depending upon the conditions confront with the firm in which achievement must happen.

According to Loft (1991), the progress of accounting must be mostly perceived as a constitutive of new needs rather than a reaction to them. As companies deal greater uncertainties, accounting, as an information system, plays an important part in the improvement of them (Huang, Tayles, & Luther, 2010). Although there is ample evidence to support a positive impact of intellectual capital on corporate market values (Chen, Cheng, & Hwang, 2005; Choi, Kwon, & Lobo, 2000) and financial performance (Bontis et al., 2000; Chen et al., 2005; Wang & Chang, 2005; Youndt, Subramaniam, & Snell, 2004), not all point towards a positive relationship; some indicate negative relationships as well. For example, in a study that explored the link between innovation, IT, and performance, the researchers found a nonlinear association between innovation capital and business performance (Huang and Liu, 2005).

Similarly, Firer and Williams (2013) discovered an inverse relationship between human capital and VAIC (Value Added Intellectual Coefficient or also known as the Value Creation Efficiency Analysis) measures in the South African Market. On the other hand, some studies fail to discover any link between components of intellectual capital and performances (Chen et al., 2015; Fernandes, Mills, & Fleury, 2015). This is suggestive of the fact that higher ICs are not always appreciated and is more reliant upon context than one might think, which might significantly vary the level of IC within organizations. The foregoing argument drives us to the contingency theory. From contingency lens, entities achieve effectiveness via tailoring the features of the firm to manifesting contingencies vis-à-vis the condition of the firm, e.g.

organizational environment, organizational size, and organizational strategy (contingencies) influence firms' structure (characteristic) (Donaldson, 2001).

Population ecology resembles contingency theory, as it completely presumes that the top organizations survive at any period of time, which renders 'Fit' an outcome of evolution (Gerdin & Greve, 2004). Gerdin (2005) questioned this view by pointing out the existence of misfit (fit) between contingency and structural variables, leading to lower (higher) performance at least over a short period of time. Contingencies stemming from the operational environment influence the element of intellectual capital that can be perceived as characteristics of an entity. According to Pitkanen (2007) the factors of intellectual capital and the contingencies should fit with each other if an entity wishes struggling to survive. It's believed that the accessibility of internal IC information adapts to fit operational environment or contingencies (Huang et al., 2010). However, some empirical findings such as Wang and Chang (2005) and Claycomb, Dröge, and Germain (2001) which focusing on external information and value, contended that firm's value and financial performance is positively affected by IC. Scarce research conceptualize and clarify the association between contingency/operational factors and intellectual capital in a systematic manner.

2.2 Empirical Review

2.2.1 Concept of intellectual capital

Numerous academics disagree on the notion of intellectual ability due to measuring issues. A wider concept known as intellectual capital encompasses human capital, relational capital, and structural capital. Different from intangibles, intangible assets, or intellectual property is intellectual capital. According to Montequen et al. (2006), Kim et al. (2010), Manzari et al. (2012), there is no single definition for

intellectual capital. Since there is no widely accepted definition for intangibles, the term is frequently used as a noun to denote something similar to intellectual capital in accordance with Meritum's guidelines (2002).

Intellectual capital can be explained using various bases, including individual and firm-level analysis, current and future value, and input and output foundation, according to Kim and Kumar's (2009) study. Financial standards that are acknowledged as assets and permitted on balance sheets are known as intangible assets. Intangible assets that may be accounted for in traditional financial accounts, such as patents, trademarks, and copyrights, are referred to as intellectual property. The definition of an intellectual capital framework by Danish Guideline (2003) and Meritum (2002) is the combination of relational resources (such as clients, suppliers, and network partners, and the knowledge exchange that occurs between them), human resources (such as employees' skills, competences, commitment, and loyalty), and organizational/structural resources (such as intellectual property, procedures, and documented information).

According to a study by Chu et al. (2006), a firm's worth is created by its combination of knowledge assets and intellectual capital. According to a Bukh et al. (2001) study, corporate, human, and consumer capital all comprise intellectual capital. According to a study by Peng et al. from 2007, intellectual capital is a collection of hidden assets that a company has. Although it is not listed on the balance sheet, it is important for the firm to maintain sustained competitive advantages. Human capital, structural capital, and relational capital are the three factors that make up intellectual capital (Wall, 2005; Torres, 2006; Beattie & Thomson; Rudez & Mihalic; Tai & Chen, 2009).

2.2.2 Components of intellectual capital

2.2.2.1 Human capital

The main resource of a corporation is its human capital (Yang and Lin, 2009). It refers to the information that workers carry with them when they leave the company (Ricceri, 2008), some of which may be generic while others may be specific to the individual. The pool of useful knowledge, skills, capacities, productivity of an organization, and competences for people and groups that support an organization's wealth is known as human capital (Bozbura and Beskese, 2007; Baker, 2008; Ramezan, 2011; Lim et al., 2010). This consists of people's knowledge, wisdom, competence, intuition, and ability to meet the tasks and goals at hand, as well as their values, culture, and philosophy.

Ability to innovate, be creative, have knowledge and expertise, work well in teams, be flexible with employees, be able to tolerate ambiguity, be motivated, be satisfied, be able to learn, be loyal, and have had formal training and education. According to the various definitions of human capital, the elements of attitude and motivation, competence, skill, and capability, creativity and innovativeness, experience and expertise, unique personal qualities, knowledge, and efficiency clearly characterize the element of human capital. Meca and Martinez (2007) suggest that human capital components differ dramatically from one organization to another, even though certain organizations may place more emphasis on them than others.

Higher human capital can lead to a variety of benefits, including better organizational performance, strengthened core competencies, increased organizational success, sustained competitive advantage, notable improvements in financial performance, strategic renewal, and a source of creativity and innovation (Yang and Lin, 2009; Kim et al., 2010; Doong et al., 2010; Bozbura et al., 2007; Zula and

Chermack, 2007; Gavius and Russ, 2009; Ramezan, 2011). Employee performance reviews are a great tool for directing employee behavior. Managers need to integrate performance standards actively and openly for knowledge processes in their performance reviews. (i.e., the development, application, and sharing of knowledge) to make them better. Performance reviews should place a strong emphasis on growth and feedback (Lepak & Snell, 1999, 2002).

To find out if there are any differences between performance and goals, it is helpful to get feedback (Shipton et al., 2006), Because of this, employees are urged to think imaginatively (Jiang et al., 2012). In addition, evaluations that have a focus on growth and learning may give staff members the assurance they need to pursue chances for higher-level learning (Jiang et al., 2012; Stiles, Gratton, Truss, HopeHailey, & McGovern, 1997).

2.2.2.2 Structural capital

The final element of Intellectual Capital is structural capital, which is defined by Martinez-Torres (2006) as the total amount of assets owned by the company that enable its potential to innovate. Company culture, organizational structure, organizational learning, operational process, and information system, as well as the firm's vision, management philosophy, organization culture, strategies, procedures, working systems, and information technology, can all be specifically referenced as assets (Ramezan, 2011). Organizational capital, according to Beattie and Thomson (2007) who contributed to this idea, is the knowledge that remains within the company at the conclusion of the working day. This includes the organizational practices, policies, frameworks, cultures, and databases. Culture, knowledge-based infrastructure, intellectual property, procedures, working methods and routines, and organizational route are five categories of structural capital that the authors

highlighted. An organization with strong structural capital will foster an environment where human capital may be used and developed to the best extent possible, hence boosting its innovation capital and customer capital.

2.2.2.3 Rational Capital

According to literature, the development of relationships between an organization and its surroundings is referred to as relational capital (Alcaniz et al., 2011; Silvestri and Veltri, 2011). Customers, middlemen, suppliers, interorganizational alliance partners, regulators, institutional figures, pressure groups, communities, creditors, and investors can all be developed in such partnerships (Marr, 2008). Additionally, it represents the culmination of an organization's interactions, closeness, and relationships with both internal and external stakeholders (Chen, 2009). According to Rudez and Mihalic (2007), direct distribution channels, image and brand, and customer pleasure and loyalty make up relational capital.

Numerous authors have specifically grouped the definitions of the idea of "Relational Capital" into the following categories: clients, stakeholders, corporate identity, internal problems, market presence, commercial contracts, and suppliers. Relational or client capital is regarded to have a more direct impact on a company's value and organizational performance than human and organizational capital, making it the primary factor in the conversion of Intellectual Capital into market value (Chen et al., 2004; Bontis, 1998). Additionally, businesses grow customer capital through the connections they forge with their management, staff, and clients (Chang and Tseng, 2005; Duffy, 2000; Kim et al., 2010).

2.2.3 Balanced scorecard

The Balanced Scorecard Measures that Drive Performance is a 1992 article from the Harvard Business Review by Kaplan and Norton (1992) that introduced the balanced scorecard idea. In the context of universities, this strategy may also be used. The balanced scorecard Balanced Scorecard in Universities can be used as a tool for managing the operations of academic and non-academic university departments, as well as the mechanisms of budgeting and target agreements (Küper, 2013). The idea aims to fix the flaws in conventional performance measurement systems, which exclusively consider financial results (Pietrzak et al, 2015).

The basic tenet of Norton and Kaplan is to give managers a condensed set of indicators while coordinated, to form an interpretive framework for the business while also avoiding the risk of information overload, which is the idea that having too much information may make it less likely that the recipient will actually use it. The balanced scorecard is clearly described by Kaplan and Norton as "a set of measures that gives top managers a quick but thorough perspective of the firm" (Kaplan & Norton, 1992). The performance and strategic positioning of an organization cannot be adequately viewed from a single economic-financial analysis perspective.

A necessary economic and financial toolkit for managers is made up of budgeting, analytical accounting, and reporting systems, but it is only adequate in exceptionally stable environments. The dynamic nature of the competitive environment forces the implementation of guiding tools, specifically the balanced scorecard, which by providing new analysis perspectives enables managements to capture the multidimensional aspects of measurement, have both an overall and synthetic view of business performance, and ensure a strategic approach, enabling them to translate strategy into actual actions.

The balanced scorecard does not replace financial metrics, rather complements them (Kaplan & Norton, 1996). The two American authors present the following four perspectives: Economic-financial perspective: It is a tool that, following initial formulations designed for private enterprises, has found usage in the public sector and non-profit organizations. It targets readers of financial statements and aims to monitor the relationship between the organization and its shareholders. Customer viewpoint: It succeeds in measuring its connection to the market. It illustrates the organization's goals for maximizing customer happiness, increasing their loyalty, and retaining consumers from the perspective of the customer.

Internal process viewpoint, the organization must excel in the core operational processes that are identified. It's interesting to notice that Kaplan and Norton advocate for not overlooking the market, stating that "internal metrics to the balanced scorecard should be drawn from those business operations that have the highest impact on the consumer" (Kaplan & Norton, 1993). A view of development and learning, Long-term objectives must be balanced with short-term ones in success targets that are dynamically adapted to the marketplace. As a result, this perspective attempts to emphasize objectives and measurements for innovation, growth, and the learning of new skills so that they can adapt to a road of constant progress.

In its designers' ideas, the balanced scorecard has developed. It was developed as a performance measurement and evaluation tool first, and then it was evolved into a process that could connect everyday operations to long-term strategic goals, creating the ultimate strategic control tool. Consequently, after a few years, the balanced scorecard has been refined and widely used in a variety of fields, not just performance evaluation. It has also proven to be a successful way to sway corporate direction. Because indicators must accurately reflect the organization's strategic objectives, the

installation of a balanced scorecard highlights the relationship between strategy and those metrics.

3.2.4 Intellectual capital and organizational performance

One of the critical resource and enhancer of firm performance and value creation is intellectual capital (Itami, 1991; Teece, 1998; Mayo, 2000). The fact that makes a business successful hinge upon the function of the quality of the knowledge contents that are available to construct and expand reliable products and services, tailored to the specific requirements of individuals (Wiig, 1997). Research that emphasizes intangible assets is ubiquitous (both theoretical and empirical). According to Narver and Slater (1990), business performance (ROA), relational capital, and market orientation are closely connected. Along the same lines, Jaworski and Kohli (1993) observed market orientation as a major determinant of performance on a study of 222 US business units.

Many precious changes and considerable successes are achieved by intellectual capital through understanding, developing, and managing the firm's intangible assets, which are the most imperative intangible resource in the organization (Nonaka & Takeuchi, 1996). Lev and Sougiannis (1996) investigated the relationship between intangibles and financial measures. Edvinsson (1997) detected the 'hidden values' of a company, using it to construct an IC management model. He utilized the work of Sveiby's (1994), basing his work on concepts of reporting external capitals, relabeling these intangible assets as Intellectual Capital.

Bontis (1998) uncovered the link between IC and business performance, while Bontis et al. (2000) also revealed that human, customer, and structural capital have a direct correlation with business performance, with the notable exception of industry type (service and non-service organizations). Chen et al. (2004) also unearthed an

imperative link between four elements (customer, innovation, structural and human capital) of Intellectual Capital and business performances. They also proved the existence of a significant link between the elements of Intellectual Capital. Finally, Tseng and Goo (2005) analyzed the link between IC and value creation. They utilized three financial methods for value creation, along with the link between four elements of IC (human, structural, customer and innovation) and corporate value.

The empirical results proved the existence of a direct correlation between Intellectual Capital and corporate value. Bontis (2000) posited that market orientation is embedded in the conceptualization of relational capital. Narver and Slater (1990) determined that market orientation and business performance (ROA) are directly correlated. Jaworski and Kohli (1993) reported on a study that utilized 222 US business units, putting forth the idea that market orientation is imperative vis-à-vis performance, regardless of the presence of market turbulence, competitive intensity, and technological turbulence. Ruekert (1992) reported a direct correlation between the degree of market orientation and long-run financial performance. In the UK, Greenley (1995) saw that a collection of companies with higher market orientation is superior in terms of (ROI) compared to groups having lower market orientation. Lusch and Laczniak (1987) analyzed how a company's increased focus on extended marketing concept that is like market orientation is directly correlated to financial performance.

Global markets have experienced a transition from capital-intensive industries into knowledge-based industries, possessing higher propensities to move towards intangible resources. Traditional PMS with a limited set of measures is not any more applicable to measuring the performance of such firms, which possess high intangible resources. The companies such as Microsoft are built on a foundation of the long-run value embedded in their IC resources and their continuing innovativeness (Barsky &

Bremser, 1999). The benefits derive from IC are difficult to measure, such as learning, innovation, customer satisfaction, R&D, and market knowledge. Accordingly, it's plausible to conclude that traditional performance measurement systems are not workable in today's knowledge-based economy that consists of innovative business context and realities (Amaratunga et al., 2001).

This is evident via the fact that the market value of high IC firms normally exceeds book value. That is, the conventional PMS are incapable of capturing and monitoring integrated elements of performance. For example, as Amir and Lev (1996) are adamant of the fact that almost 40 per cent of the market valuations of average firms are missing from their balance sheets. In cases of high-technology firms, the rate is 50 per cent. However, this can be contingent upon the going on in the stock market. According to Amaratunga et al. (2001), 70 per cent of investors base 30 per cent of their decisions upon non-financial performance; with financial analysts following suit, via placing emphasis upon the exploitation of non-financial indicators, since they can provide more accurate prediction.

Tayles et al. (2002) regard internal management figures as defining and quantifying the responsibilities and influence of intellectual capital to turn into real strategic value. It is of more significance in modern companies to use the relevant treatment of intellectual capital within the function of management accounting. Focus has moved on from 'what we own' to 'what we know' and attempts to quantify intangible assets are considered both a strategic challenge and a value adding activity. However, it must not be forgotten that real danger of converting intellectual assets into 'hidden' value is always present. Organizations that failed in engaging innovative and strategic PMS, or emphasized its evaluation, appraisal, and measurement, will

neglect of what may prove be the organization's most valuable resource (Tayles et al., 2002).

2.3 Conceptual Framework

The figure below proves that balanced scorecard is the dependent variable while intellectual capital is the independent variables. The figure also depicts that there is also a link or relationship between intellectual capital and balanced scorecard. After assessing the various theories and models based on their strengths and weaknesses and the empirical review, The variables (human capital, structural capital and relational) in the framework were measured in relation to the intellectual capital domains while financial measures, customer measures and internal business processes measures and innovation and learning measures showed the interrelatedness of the variables that could result in the measurement of balance scorecard. In other words, the framework looked at the relationship between intellectual capital and balance scorecard. The relationship was also considered of socio-economic factors moderating how the intellectual capital affect performance measured by balanced scorecard.

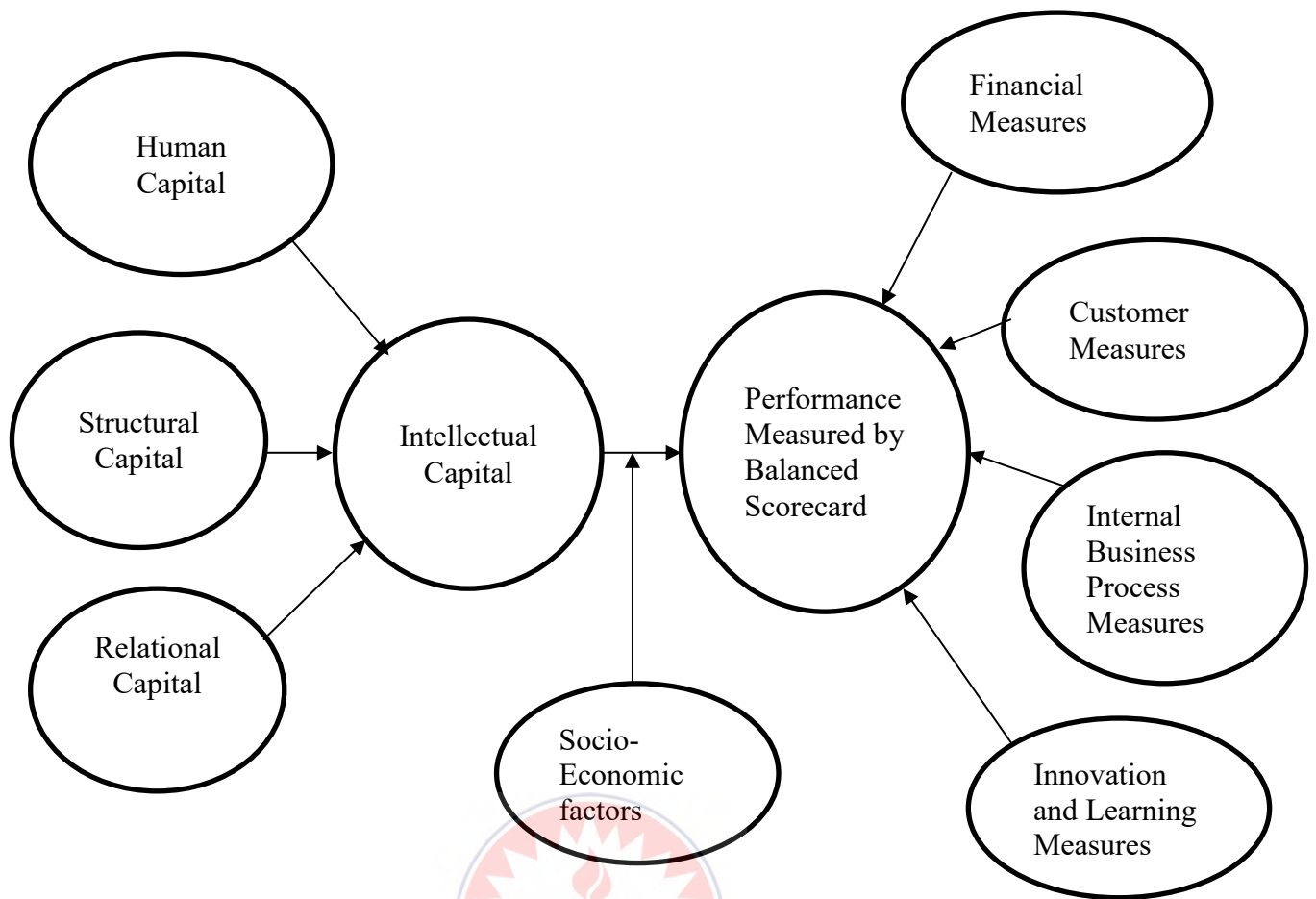


Figure 1: Conceptual framework of the study

Source: Authors construct (2022).

In a nutshell, the framework assumes that intellectual capital should directly influence performance measured by balanced scorecard. Nevertheless, socio-economic factors could serve as obstacles to putting knowledge into practice as well as obtaining more knowledge hence it can moderate the effect that intellectual capital will have on the performance measured by balance scorecard. It also shows that socio-economic factors could impede the performance of the universities.

2.4 Summary of Chapter

This chapter discussed relevant theories and models as well as the conceptual framework guiding the study. The chapter highlighted related theoretical approaches and models related to intellectual capital and performance and the conceptual framework guiding the study. The dynamic theory of intellectual capital was reviewed in addition to the empirical review of all the research objectives of the study.



CHAPTER THREE

METHODOLOGY

3.0 Overview

This section presents the methods that the researcher used in executing the study by discussing the research paradigm, research design, the population, the sample, and the sampling procedure. It also discusses the instruments used, data analysis, data-collection procedure, validity and reliability and ethical consideration.

3.1 Research Paradigm

According to Gillani et al (2016) a paradigm provides a conceptual framework for seeing and making sense of the social world. The significance of paradigms is that they shape how researchers perceive the world and are reinforced by those around them and the community of practitioners. Within the research process the beliefs a researcher holds will be reflected in the way the research is designed, how data is both collected and analysed, and how research results are presented thus, it is very important for the researchers to recognize their paradigm as it allows them to identify their role in the research process, determine the course of any research project and distinguish other perspectives (Gropper et al 2012).

From this backdrop, Positivism was used as a paradigm in this study. The positivist paradigm of exploring social reality emphasizes observation and reason as means of understanding human behavior. This study is premised on positivism because when it comes to the determinism which means that events are caused by other circumstances; and hence, conducting a study on the relationship between intellectual capital and performance measured by the balance scorecard aids in

understanding for prediction and control. For the empiricism, this study collects verifiable empirical evidence from respondents specifically Heads of the various Department in the Public universities in Ghana, with the view of supporting the theoretical basis for the relationship between intellectual capital and performance measured by the balanced scorecard. The positivistic paradigm thus systematizes the knowledge- generation process with the help of quantification, which is essentially to enhance precision in the description of parameters and the discernment of the relationship among them (Soltanian et al. 2007).

3.2 Research Design

A research design is an overall plan for obtaining answers to research questions (Polit & Beck, 2008). A design specifies the logical structure and the plan to be followed in the execution of a study (Alanzi et al, 2017). The design specifies what variables or entities to examine, under what conditions to examine them, what type of data to collect, from whom and at what time to collect the data, what methods to employ for data collection, and what implications ensue for subsequent data analysis (Apini et al, 2018).

The study used a descriptive causal design. The purpose of using descriptive causal was to collect detailed and information that describe objectives of this study which examining the relationship between intellectual capital for public universities from the balanced scorecard perspective. Data was collected based on the concepts defined in the research model and hypotheses. Finally, the descriptive causal survey was deemed appropriate because of the questionnaire aimed at finding the Intellectual capital for public Universities from the balanced scorecard perspective.

3.3 Population

A population is any complete group of entities sharing some common set of characteristics (Zikmund 1997). In view of this, the population under study could be defined as all Heads of Department in the public universities in Ghana. For the study all public universities which are over 25 years were used and are within the Middlebelt and Southern zone of Ghana were considered for the study. Against this backdrop, the public universities considered were University of Ghana (UG), University of Cape Coast (UCC), Kwame Nkrumah University of Science and Technology (KNUST) and University of Education, Winneba (UEW). According to basic statistic for graduation for these universities, there are about 321 Heads of Department in these public universities. The distribution of the population are as follows

Table 3.1: Population of heads of department summary

University	Population of HOD's	Source
UG	86	Statistics for Graduation, 2022
UCC	75	Statistics for Graduation, 2022
KNUST	91	Statistics for Graduation, 2022
UEW	69	Basic Statistics for Graduation, 2022
Total	321	

Source: Statistics for Graduation for all Universities selected (2022)

3.4 Sample, sampling technique and procedures

To enhance the confidence in the findings and conclusions from this study, the study follows scientific and empirical means to determine the sample size. Therefore,

the present study uses the model developed by Yamane (1967) to determine the sample size. Yamane's sampling size determination model is presented as:

$$A = \frac{k}{[1 + k(e)^2]}$$

Where: **A** represents the sample size,

k represents the population,

e represents the error limit (0.05 based on 95% confidence level)

Substituting the data on these variables in the study, the sample size is determined as:

$$A = \frac{321}{[1 + 321(0.05)^2]}$$

$$A = \frac{321}{1.8025}$$

$$A = 178$$

Therefore, using a population of approximately 321 Heads of Department in the public universities in Ghana with an error limit of 5%, a sample size of 178 is considered adequate as computed above. After determining the sample size, the study proceeds to determine and apply the sampling technique. To ensure a fair representation of each of the universities, the stratified sampling was then used by dividing the public universities based on their core mandates to select 44 Head of Department from each public university. This gives a total of 176 heads of departments which were used for the data collection.

3.5 Source of Data Collection

Data collection refers to pieces of information collected during a study (Sim & Wright, 2000). A structured data-collection approach always operates with a formal written instrument known as a structured interview schedule or a questionnaire guide. Polit and Beck (2008) identified the following characteristics of a structured data

collection: The wording is pre-determined and standardized; the same method or instrument is used for all respondents; It involves developing possible responses to questions designed by the researcher before data collection; the order and the sequence of questions are specified and uniform and Data collected can be quantified with ease. In this study, a structured data collection approach was used as the data was quantified at the end.

3.6 Data Collection Instrument

This research study used questionnaires as the primary research instrument for the collection of the data. A questionnaire was used to obtain important information about Intellectual capital for public Universities from the balanced scorecard perspective in University of Education, Winneba. The questionnaire was divided into three sections, which is section A which talks about demographic information of the person such as age, sex, educational level, and the working experience. And the remaining sections relate to the relevant variables included in the study namely, Intellectual capital (independent variable), the balanced scorecard perspective (dependent variable), and it was measured by Likert (1932) five point-scale. (1=strongly disagree, 2=disagree, 3=neutral, 4=Agree, 5=Strongly Agree) for both the Intellectual capital and balanced scorecard. The variables were measured as follows.

In order to assess the presence of Intellectual Capital, the researchers adopted the Intellectual Capital scale developed by Martin-Sardesai and Guthrie (2018), Oliver (2013) comprising of fifteen (15) items to measure the dimensions of Intellectual Capital such as human capital, structural capital and relational capital. Responds were obtained from a 5-point Likert-type scale where 1=strongly disagree, 2=disagree, 3=neutral, 4=Agree, 5=Strongly Agree. For the assessment of the presence of balanced scorecard, the researchers adopted the balanced scorecard scale

developed by Robert Kaplan and David Norton (1992), comprising of fifteen (15) items to measure the dimensions of balanced scorecard such as customer perspective, internal business perspective, innovation and learning perspective and financial perspective. Responds were obtained from a 5-point Likert-type scale where 1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

3.7 Validity and Reliability of the Instruments

Face validity of the questionnaire was carried out by giving it to the heads of Department of Perez University which is in Winneba for peer review. Perez University was selected because it is a private university which has been mentored by the University of Cape Coast for more than a decade now hence it is much likely they could influence the intellectual capital and performance of the university. Their comments and suggestions were considered for review of the questions. The content validity of the questionnaire was ensured by empirical studies as well as the research supervisor who scrutinized the items for their suitability before pre-test. All the necessary corrections in the items were made and declared valid by the supervisor. The construct validity was ensured by critically developing the items or questions within established theoretical framework by employing accepted definitions and constructions of concepts and terms. The current researcher also adopted the internal validity check. This was done through ensuring agreements between different parts of the data, matching patterns of results.

Joppe (2000) defines reliability as the degree to which outcomes are reliable in a period of time and if the outcomes in research can be replicated using the same method, then the research instrument is reliable. To ensure reliability of the questionnaire, it was pretested on all the heads of Departments and the result was subjected to Cronbach's alpha reliability analysis using Statistical Package for Social

Sciences (SPSS) version 25.0 to determine the reliability coefficient (r) in order to establish the reliability of the instrument. A reliability coefficient (r) of 0.779 was obtained and this was deemed as an acceptable measure of reliability because more than 0.70 the threshold value of acceptability is achieved as a measure of reliability (Dörnyei & Taguchi, 2010).

3.8 Data Collection Procedure

The administration of the questionnaire and the observation were done after consent was sought from the authorities of the various public universities. All information were kept confidential and utilised for research purposes only. The principal investigator kept all data. Due to the strike action by the universities, getting access to meet some of the respondents physically was difficult hence the structured questions were upload using google doc. After this was done, the website link was sent to the WhatsApp platforms of the Heads of Department of the various universities on the 15th April 2022 to 15th July 2022 to allow for a three-month time gap for respondents to answer the question.

3.9 Structural Equation Modelling (SEMs)

Structural equation models (SEMs) offer liveness for testing such models, allowing one to use multiple predictors and criterion variables, construct latent (unobservable) variables, model errors in measurement for observed variables, and test mediation and moderation relationships in a single model (Hair et al. 2012; Bentler, & Huang 2014; Bisbe & Malagueno 2015; Hair et al. 2016). SEM covers all the reflective indicators in one construct. The two types of SEM are Covariance-based structural equation modeling (CB-SEM) and partial least squares structural equations modeling (PLS-SEM) used in research. Because of theoretical and methodological

issues, there had been an increase in the use of PLS-SEM compared to that of CB-SEM (Hair, Sarstedt, Pieper, Ringle, & Mena, 2012). According to Kumar and Sujit (2018), variance which predicts construct relationship is explained effectively by PLS-SEM and this method emphasizes maximizing the explained variance of the endogenous latent variables instead of replicating the theoretical covariance matrix. PLS-SEM methodology becomes very useful to conduct predictive analysis with highly complex data. This methodology estimates latent variables through composites, which are exact linear combinations of the indicators assigned to the latent variables (Nitzl, 2016).

From this backdrop, the Partial least square structural equation modelling methodology (PLS-SEM) was employed to examine the effect of intellectual capital and balanced scorecard. The PLS-SEM methodology was adopted based on the assumption that the demographic characteristics; intellectual capital and balanced scorecard all have more than one latent variable. The researcher used the Smart-PLS software to apply PLS-SEM as this technique effectively handles nonlinear relationships. As a first step in PLS-SEM, missing data imputation is carried out by Stochastic Multiple Regression Imputation algorithm. The latent constructs consist of reflective measurement scale which are interchangeable and must be highly correlated. In the initial assessment of the model, the loadings of all the variable indicators in the constructs is used for scale purification. Any indicator which has less than 0.5 loading is dropped from the model. This means that the indicator is different from the rest and must be dropped. In this study none of the latent variables were dropped.

3.10 Theoretical Model Based on SEM

The theoretical model (original model) includes an exogenous latent variable and three endogenous latent variables. The intellectual capital latent variable human capital, structural capital and relational which are intend measured by different latent variables. The model employs two endogenous latent variables, including the demographic characteristics (DC), and performance measured by balanced score card (PBSC)

Therefore, the theoretical model is shown in figure 2.

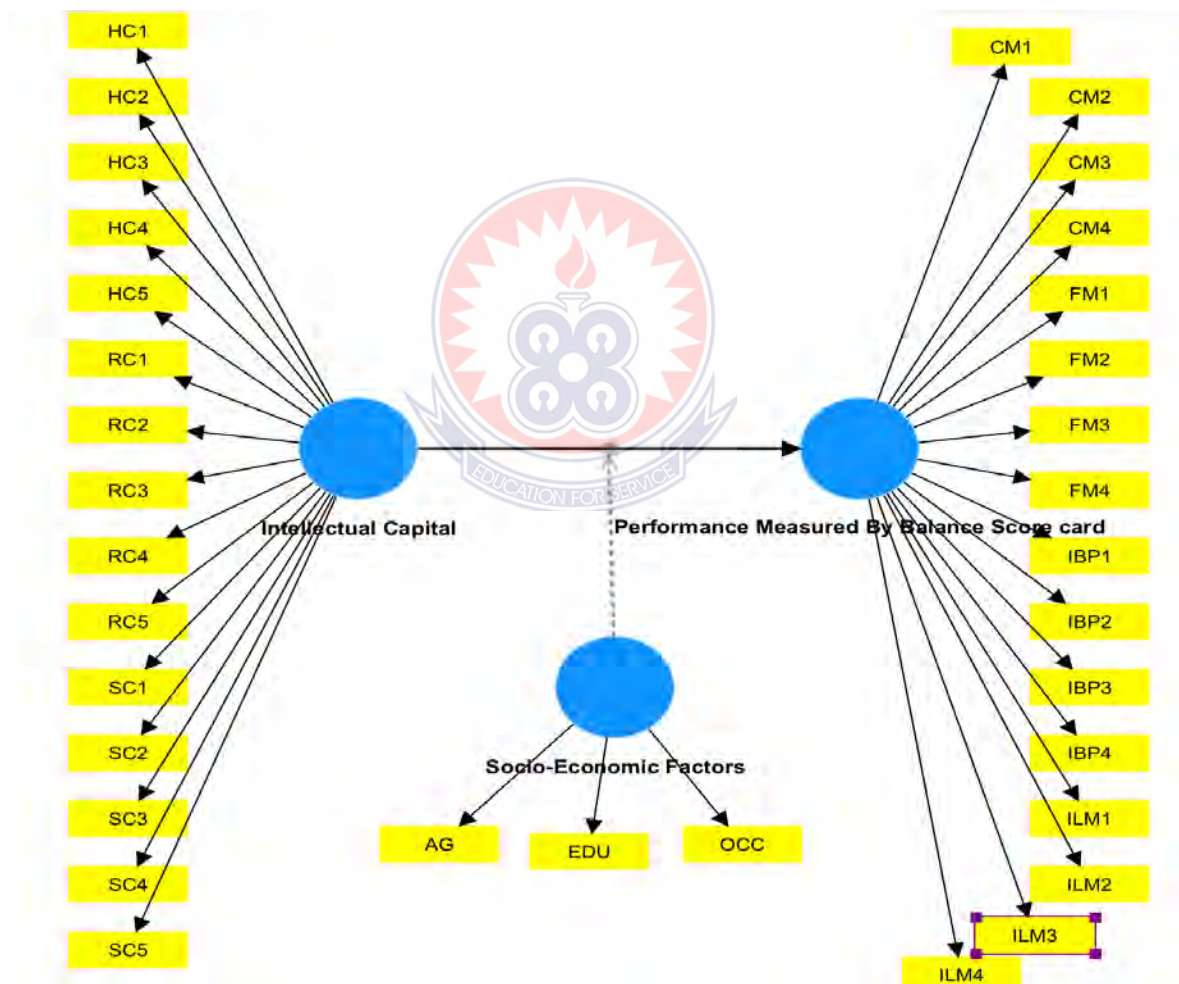


Figure 2: Theoretical model

Source: Authors construct (2022)

3.11 PLS-SEM results

As the first step in PLS-SEM, missing data imputation is carried out by Stochastic Multiple Regression Imputation algorithm. The latent constructs consist of reflective measurement scales which are interchangeable and must be highly correlated. In the initial assessment of the model, the loadings of all the variable indicators in the constructs are used for scale purification. Any indicator which has less than 0.5 loadings is dropped from the model. This means that the indicator is different from the rest and must be dropped. From this backdrop, no variable was dropped because they all had a loading of more than 0.5.

3.12 Internal Consistency Reliability assessment

Traditionally, the “Cronbach’s alpha “is used to measure internal consistency reliability but it tends to provide a conservative measurement in PLS-SEM. According to Hair et al. (2012), prior literature has suggested the use of composite reliability as a replacement. From this backdrop, the study reported the composite reliability in Table 3.2. The satisfactory range for composite reliability values is 0.60 to 0.70 in exploratory research and 0.70 to 0.90 in more advanced stages of research. As shown in Table 2, the composite reliability score of all the latent constructs is in the range 0.8188 to 0.9340 indicating that latent variables are reliable.

Table 3.2: Reliability and validity of latent construct

Measurement Scale and indicators	Standard factor loading			Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted
	Loadings	T-value	P-value				
<i>Intellectual Capital</i>				0.9231	0.9282	0.9340	0.6135
HC1	0.7359	11.8034	0.0000				
HC2	0.7911	12.4529	0.0000				
HC3	0.7570	12.6735	0.0000				
HC4	0.6898	9.9273	0.0000				
HC5	0.7492	11.6801	0.0000				
RC1	0.7034	10.1161	0.0000				
RC2	0.7077	10.1161	0.0000				
RC3	0.7307	11.2651	0.0000				
RC4	0.7380	13.7903	0.0000				
RC5	0.7969	13.8902	0.0000				
SC1	0.8088	10.7417	0.0000				
SC2	0.5212	4.2835	0.0000				
SC3	0.6319	5.3887	0.0000				
SC4	0.8324	14.2164	0.0000				
SC5	0.5606	5.4196	0.0000				
<i>Demographic Characteristics (DC)</i>				0.7221	0.7773	0.8188	0.5123
Age	0.7968	11.8154	0.0000				
Gender	0.5116	4.0216	0.0000				
LOE	0.5051	4.4831	0.0000				
<i>Performance (Balance Score Card)</i>				0.9141	0.9229	0.9275	0.5201
CM1	0.6064	5.7722	0.0000				
CM2	0.6610	6.1717	0.0000				
CM3	0.7763	10.5387	0.0000				
CM4	0.7118	9.7493	0.0000				
FM1	0.7958	12.6745	0.0000				
FM2	0.5149	4.8608	0.0000				
FM3	0.8300	10.7747	0.0000				
FM4	0.7205	9.8819	0.0000				
IBP1	0.7373	10.3105	0.0000				
IBP2	0.7982	10.7700	0.0000				
IBP3	0.7921	10.4131	0.0000				
IBP4	0.6421	5.2965	0.0000				
ILM1	0.7867	13.0046	0.0000				
ILM2	0.8099	12.0250	0.0000				
ILM3	0.7936	11.1653	0.0000				
ILM4	0.8117	12.7093	0.0000				

Source: Field work (2023)

Since the construct qualify, composite reliability test along with the criteria of average variance extracted (AVE) value is greater than 0.5, the latent variables are retained in the model. Again, Table 3.2 shows the indicator reliability which is basically the squares of the loading. All the indicators' reliability values are much larger than the minimum acceptable level of 0.4 and close to the preferred level of 0.7.

3.12.1 Convergent validity

According to Wong (2013), it is relevant to check the construct validity of each variable's Average Variance Extracted. If all the AVEs are greater than the threshold of 0.5 the convergent validity is confirmed. From Table 3.2, all the AVEs are more than 0.5 so the convergent validity is confirmed.

3.12.2. Discriminant validity

Hair et al., (2012) as cited in Kumar and Sujit (2018) argued that discriminant validity certifies that a constructed measure is empirically distinctive and represents facts of interest that other measures in a structural equation model do not capture.

Table 3.3: Correlation among latent variables with square roots of AVEs

	Intellect Capital	Socio-Economic Factors	Balance Scorecard
Intellectual Capital	0.7212		
Socio-Economic Factors	0.8676	0.6967	
Balance Score Card	0.9792	0.8719	0.7239

Source: Fieldwork (2023)

Table 3 shows the Fornell–Larcker criterion which suggests that the square root of average variance extracted must be greater than the correlation of the construct with all other constructs in the structural model. Table 3.3 shows the correlations among latent variables with the square root of average variance extracted (AVE) by each latent variable. Each latent variable average variance extracted (AVEs) is higher than the correlation of the latent variables indicating discriminant validity of the latent variables.

3.13 Data Analysis

Yin (2003) stated that before interpretation takes place, data should be displayed and presented. Responses by the respondents to each set of items in the questionnaire were tallied to get the number of respondents who answered each set of items. The quantitative data were collected from the closed-ended questions and were edited, coded, categorized and analyzed using SPSS version 25.0 and this was analysed. Most of the data were nominal or ordinal, percentages were the only descriptive statistics reported on univariate analysis. Frequency, percentage, mean and standard deviation distributions of responses were generated according to each research question raised, and this was presented in tables.

For the third objective, the study used the structural equation model (SEM) to test the relationship between intellectual capital and performance measured by the balanced scorecard. The SEM was used because it offers liveness for testing such models, allowing one to use multiple predictors and criterion variables, construct latent (unobservable) variables, model errors in measurement for observed variables, and test mediation and moderation relationships in a single model (Bentler & Huang, 2014; Bisbe & Malague. o, 2015; Hair, Sarstedt, Pieper, Ringle, & Mena, 2012; Nitzl, 2016). SEM covers all the reflective indicators in one construct. The two types of

SEM are the Covariance-based structural equation modelling (CB-SEM) and partial least squares structural equations modelling (PLS-SEM) used in research. On account of theoretical and methodological issues, there had been an increase in use of PLS-SEM compared to that of CB-SEM (Hair, Sarstedt, Ringle, & Mena, 2012; Ringle, Wende & Becker, 2015).

According to Kumar and Sujit (2018), variance which predicts construct relationship is explained effectively by PLS-SEM and this method emphasizes on maximizing the explained variance of the endogenous latent variables instead of replicating the theoretical covariance matrix. PLS-SEM methodology becomes very useful to conduct predictive analysis with highly complex data. This methodology estimates latent variables through composites, which are exact linear combinations of the indicators assigned to the latent variables (Nitzl, 2016). From this backdrop, the partial least-squares structural equation modelling methodology (PLS-SEM) was employed to examine the effect of between intellectual capital and performance measured by the balanced scorecard. The PLS-SEM methodology was adopted based on the assumption that the intellectual capital and balanced scorecard are often latent which cannot be observed directly because both variables have more than one component. cannot be measured directly unless more than one profitability ratio is used.

3.14 Ethics Considerations

Research that involves human beings as subjects should be conducted in an ethical manner to protect their rights. Polit and Beck (2008) emphasize that when people are used as study respondents, care must be exercised in ensuring that the rights of the respondents are protected. Accordingly, the researcher obtained permission to conduct the study and will respect the respondents' right to self-

determination, privacy, anonymity, confidentiality, fair treatment, and protection from harm and discomfort (Burns & Grove 2001). They were also free to back out anytime they felt uncomfortable about the study.



CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Overview

This chapter presents the analysis and interprets the findings from the data collected from the field based on the objectives of the study which was to examine the relationship between Intellectual Capital and Balanced Scorecard at the public sector. Descriptive and inferential statistics were used to discuss the findings of the study. To this end, the researcher administered questionnaires to one hundred and seventy-six (176) respondents out of which all were filled and returned. The demographic characteristics and presented first followed by the results for each objective.

4.1 Demographic Characteristics of Respondents

This study analyzed the demographic and professional background of respondents. This was because the researchers believed that the demographics and professional level of an individual influences the thinking pattern of that individual. Demographic and Professional background includes, sex, age range, level of education or qualification and tenure how long they have worked in the public universities. Amidu. (2017) noted socio-demographic characteristics have also been found to have a moderating effect on the intellectual capital and eventually performance. These variables include gender, age, marital status, religion, ethnicity, employment status, and level of education but for this study, because the population of the respondents were staff working within the public universities in Ghana, the demographic characteristics used for the study included sex, age, level of education, number of years working within the public universities.

Furthermore, in a study that investigated the familiarity of employees with an undergraduate certificate with performance, it was found out that the employees were less familiar with cyber threats (Greenfiled 2016). It is, therefore, imperious to analyze these socio-demographic characteristics of the respondents to ascertain their practical significance for the study. Table 4.1 reveals that out of 176 respondents, 108 representing 61.4% were males while 68 representing 38.6% were females. This means that majority of the heads of department in the public universities in Ghana are men.

However, the research is not based on any one gender, but it has been generalized to give a more specific depiction on the relationship between Intellectual Capital and Balanced Scorecard. This percentage of male and females is representative of the current number of HOD's in public universities in Ghana where most of whom are males. The result showed that most of the respondents (61.4%) were male, which implies that most of the responses from this study are male prejudice and it was expected because of the smaller number of dominated males as compared to that of females as head of Departments in the public universities in Ghana. This finding is consistent with the findings of Pramod and Raman (2014) that studies conducted within the private universities are likely to have a marginal increase in the percentage of males dominating managerial roles using compared to females.

It can be seen from Table 4.1 that out of 176 respondents, 64 representing 36.4% were within the age of 30-40 years group, follow by 76 representing 43.2% were within the age of 41-50 years group and 20 representing 11.4% were within 51-55 years and 16 representing 9.1% were within the age of 56 and above years group. This implies that majority of the respondents are within the age group of 41 to 50

which is usually the case because most of the head of department are senior lecturers which means that they might have worked in the university for a considerable number of years before their appointments.

Table 4.1: Demographic characteristics

Variable	Frequency (N= 176)	Percentage (%)
Sex		
Male	108	61.4
Female	68	38.6
Age		
30-40	64	36.4
41-50	76	43.2
51-55	20	11.4
56 and above	16	9.1
Level of Education		
Master's Degree	35	19.89
PhD	141	80.11
Working Experience		
2-5 years	36	20.5
6-10 years	84	47.7
11-15 years	28	15.9
More than 15 years	28	15.9

Source: Field work, (2022)

Wang et al. (2015), found that younger people were significantly more likely to have less intellectual capital and might negatively influence performance.

Venkatesh, Morris, & Davis (2013) found that age is an important demographic predictor in organizations. To this, the prior research states that increasing age has increases attitudes towards work (Xu et al. 2019). The reasoning for this could be that older people have more experience which culminates into intellectual capital, are less open to change, and could positively influence the performance of the organisation. From the result, majority of the respondents (43.2%) were between the ages of 41 to 50 years, followed by 36.4% between 30-40 years and 11.4% between 51-55 years. This implies that the findings of the study are based on the youth because the findings reflect the opinions of the youth who are the most active population in lecturing in public universities in Ghana. This will also go a long way to assist university management to draft a policy to protect the interest of the youth and train them to maintain them towards effective and efficient improvement in their intellectual capital.

In addition, Table 4.1 explains that respondents sampled were mainly PhD degree holders representing 80.11% of the Head of Departments while 19.89% were masters' holders. This indicates that the respondents were highly educated which is reflective of the positions held by them. In addition, PhD is a requirement of lecturers in public universities in Ghana. From Table 4.1, PhD degree holders dominated the level of education of the respondents representing 80.11% and master's degree holders represented 19.89%. This finding is significant in the sense that the level of one's education affects the level of intellectual capital especially human intellectual capital as well as relational intellectual capital. In addition, it is expected that if staff members have a reasonable level of education this is likely to performance through their effective and efficient delivery. These findings are consistent with the results of Amidu (2017) on intellectual capital and SMEs in Ghana, which showed that most of

the employees sampled had higher levels of education such as diplomas, degrees, and professional qualifications.

From Table 4.1, 15.9% staff has been with the university for more than 15 years, 20.5% between 2-5 years, 47.7 % fall below 6-10 years and 15.9% between 11-15 years. The staff who worked for the organization between 2-5 years formed the majority. From the result, most of the respondents have worked with the universities for more than 5 years. This means that, they are experienced enough to provide objective information of the intellectual capital of their various departments. These figures demonstrate that the respondents are familiar with the company's processes and business environment. Hence, they have the relevant knowledge to answer the questionnaire which results later in a more reliable analysis.

Someone who performs the same task repeatedly will keep more things in his memory and can develop a good understanding of the various events of Ariani (2010). Work experience is the period or length of time someone works in an agency, office). The more experience a person has in his field of science, the easier it will be for him to learn new things to improve his performance, this is in line with the research of Ariani (2010) and Adrian (2015) stating the influence of experience has a positive effect on intellectual capital is an ability, talent or skill that exists within every human being Adrian (2015). From this backdrop, because most of the respondents had worked for some period of years, plays a major role to improve the balance scorecard.

4.2 Presentation of Results and Discussion

4.2.1 Assessment of the Intellectual Capital of Public Universities in Ghana

To achieve these objectives, the researcher decided to carry out a descriptive analysis on the variables in the study for each objective. From a five-point Likert Scale ranging from 1 to 5, Strongly Disagree to Strongly Agree respectively, the analysis was drawn using the mean to determine which variable had the highest and lowest score from respondents. Below are the tables (4.2, 4.3 and 4.3) showing the descriptive analysis of each objective. The first intellectual capital to be assessed is the Human intellectual capital and From Table 4.2, it can be seen that the number of conferences attended by Lecturers/Number of lecturers recorded the highest mean is 4.20 while the next highest means was the number of book chapters published by faculty/ total departmental faculty strength which explains that the human capital base of the public universities in Ghana are very high because attending conferences and publishing book chapters requires very high intellect. The lowest standard deviation score is 0.590 meaning that there is stability in the results solicited from about 178 respondents.

Table 4.2: Human intellectual capital performance indicators

Variables	Min	Max	Mean	Std. Deviation
<i>HC₁</i> : Number of faculty promotions in a year/Total number of faculty in the department	1	5	3.90	.709
<i>HC₂</i> : Total funds allocated to the department for research and development (R&D)/number of researchers in the department	1	5	4.02	.698
<i>HC₃</i> : Number of PhD students/number of researchers	1	5	4.04	.805
<i>HC₄</i> : Number of researchers/numbers of administrative personnel	1	5	3.86	.765
<i>HC₅</i> : Number of PhD students coming from other universities/total number PhD students	2	5	3.88	.722
<i>HC₆</i> : Amount of departmental research budget managed at the business school level/ departmental research budget	1	5	3.88	.753
<i>HC₇</i> : Research grant won by faculties/total research budget	1	5	3.75	.918
<i>HC₈</i> : Proportion of faculty appointed through department to total faculty posted to the department	1	5	3.72	.973
<i>HC₉</i> : Number of intra department publication collaboration	1	5	3.36	.966
<i>HC₁₀</i> : Number of publications of department's faculty on the universities' website/total number of publications by faculties in the department	2	5	3.90	.675
<i>HC₁₁</i> : Number of book chapters published by faculty/ total departmental faculty strength	1	5	4.13	.765
<i>HC₁₂</i> : Proportion of non-tuition income of the department to total departmental revenue base	3	5	3.97	.590
<i>HC₁₃</i> : Number of conferences attended by Lecturers/Number of lecturers	2	5	4.20	.701

Source: Field Data (2022)

The structural intellectual capital reviews how structure within the human capital operates. The structural intellectual capital also develops and train talent to ensure that there is always institutional memory as well as a succession plan for the young. It also provides a mentoring structure which ultimately improves performance.

From Table 4.3, Number of publications by faculty of department/total publications of the school recorded the highest mean indicating that, there are structure which helps faculty members to increase their publications and ultimately attain their senior lectureship and professorial status in due time. The number of departmental seminars in a year recorded the second highest mean with 4.09 showing that most of the respondent agree that there is a lot of departmental seminars which influence the learning and research environment of the public universities in Ghana.

Table 4.3: Structural intellectual capital performance indicators

Variables	Min	Max	Mean	Std. Deviation
<i>SC</i> ₁ : Number of publications by faculty of department/total publications of the school	1	5	5.00	.932
<i>SC</i> ₂ : Number of active patents owned by the department/total number of active patents by school	1	5	4.00	.206
<i>SC</i> ₃ : Number of active patents produced by the department	1	5	3.08	.305
<i>SC</i> ₄ : Returns from patents and intellectual rights of the department/total returns from patents by the school of business	1	5	4.00	.965
<i>SC</i> ₅ : Returns from patents and intellectual rights of the department	2	5	4.01	.622
<i>SC</i> ₆ : Number of departmental seminars in a year	1	5	4.09	.753
<i>SC</i> ₇ : Verifiable mechanisms to evaluate performance of department on its strategic research plan/theme	1	5	3.00	.018
<i>SC</i> ₈ : Proportion of alumni from the department taking graduate courses at the department	1	5	4.00	.873
<i>SC</i> ₉ : Proportion of graduate students (over total number of students at the department)	1	5	4.36	.566

Source: Field Data (2022)

Finally from Table 4.3, the least item with standard deviation is the number of active patents owned by the department/total number of active patents by school. All the items recorded 1 as the minimum response showing that some of the respondents strongly disagreed with items except returns from patents and intellectual rights of the department that recorded 2 as its lowest meaning none of the respondents strongly disagreed with that item.

Table 4.4 presents the results for the relational capital. Relational capital which focuses on the intangible values present in relations an organisation has with business partners and other external parties that contribute to fulfill the public universities' needs and includes elements like the public university's reputation and student potential.

Table 4.4: Relational intellectual capital performance indicators

Variables	Min	Max	Mean	Std. Deviation
<i>RC</i> ₁ : Number of spin-offs supported by the department	2	5	3.77	.742
<i>RC</i> ₂ : Number of spin-offs funded by the department/the total number of spin-offs by the business school	2	5	3.86	.734
<i>RC</i> ₃ : Number of contracts with industry	3	5	3.95	.645
<i>RC</i> ₄ : Number of contracts with public organisations by department/total comparable number for business school	2	5	3.97	.762
<i>RC</i> ₅ : Number of successful research collaboration between departmental faculties with researchers outside the university	2	5	4.06	.789
<i>RC</i> ₆ : Funds from industry/total budget for research	2	5	4.15	.775
<i>RC</i> ₇ : Evidence of existence of a technology transfer institution for intellectual property management	1	5	3.75	.918
<i>RC</i> ₈ : Total appointments of faculty to national and international standards setting committees	1	5	3.72	.973
<i>RC</i> ₉ : Total number of position papers, policy drafts, consultancy (of national character) that emanates from the department	3	5	3.90	.640

<i>RC₁₀</i> : Number of committees served on by faculties of the department in the university (excluding those of business school)	2	5	3.91	.621
<i>RC₁₁</i> : Number of documented position papers, policy drafts by departmental faculty to immediate university community	2	5	4.06	.589
<i>RC₁₂</i> : Number of times the departmental faculty involved in social and cultural life	3	5	3.15	.452
<i>RC₁₃</i> : Number of times the departmental faculty involved in a sporting event (excluding department specific sporting events)	2	5	3.98	.670
<i>RC₁₄</i> : Number of documented department-sanctioned public engagements in media on scientific issues that concern the discipline of the department	2	5	4.10	.0145
<i>RC₁₅</i> : Number of existing collaborations with government, industry, Alumni and other stakeholders	2	5	3.209	.921

Source: Field Data (2022)

From the result, the item with the highest mean is the Funds from industry/total budget for research with a mean of 4.15 followed by Number of documented department-sanctioned public engagements in media on scientific issues that concern the discipline of the department with the mean of 4.10. This implies that the public universities in Ghana have a very good relational capital which is significant for being autonomous and self-financing. The item with the next highest mean is the number of successful research collaboration between departmental faculties with researchers outside the university with a mean of 4.06. This also means that the public universities in Ghana have the potential of running joint Programmes with foreign universities due to their well-endowed relational capital.

In terms of the minimum and maximum respondents most of the items which measured relational capital were not strongly disagreed with while a maximum of 5 for all the items showed that the respondents strongly agreed to all the items under relational capital. The first objective of the study seeks to assess the Intellectual Capital of Public Universities in Ghana. Overall, the findings of the study revealed

that majority of the respondents asserted and agreed that for the public universities have a very high intellectual capital. In relation to the specifics, with respect to human intellectual capital, the number of conferences attended by Lecturers/Number of lecturers recorded the highest meanwhile the next highest means was the number of book chapters published by faculty/ total departmental faculty strength which explains that the human capital base of the public universities in Ghana are very high because attending conferences and publishing book chapters requires very high intellect. This implies that with the human intellectual capital, teaching staff of the public universities can easily get promotion because they could publish which is a main yardstick for promotion in the public universities in Ghana. The result also means that soon most of the public universities in Ghana will be rated high due to the visibility of the universities through the publications of their lecturers.

From the theoretical perspective, the findings indicate consistency with the economic theory of human capital, which continues to serve as a significant theoretical pillar and strongly supports intellectual capital from the human capital perspective. In addition, from the structural intellectual capital perspective, the number of publications by faculty of department/total publications of the school recorded the highest mean indicating that, there are structures which help faculty members to increase their publications and ultimately attain their senior lectureship and professorial status in due time. The number of departmental seminars in a year recorded the second highest mean showing that most of the respondents agree that there is a lot of departmental seminars which influence the learning and research environment of the public universities in Ghana.

This finding is consistent with the analysis of Yang and Lin, (2009) Kim et al., (2010) Doong et al., (2010) Bozbura et al., (2007), Zula and Chermack, (2007), Gavius and Russ, (2009) Ramezan, (2011) who all agreed that higher human capital can lead to a variety of benefits, including better organizational performance, strengthened core competencies, increased organizational success, sustained competitive advantage, notable improvements in financial performance, strategic renewal, and a source of creativity and innovation. In addition, the finding is consistent with the empirical studies which asserted that the pool of useful knowledge, skills, capacities, productivity of an organization, and competences for people and groups that support an organization's wealth is known as human capital (Bozbura & Beskese, 2007; Baker, 2008; Ramezan, 2011; Lim et al., 2010). This consists of people's knowledge, wisdom, competence, intuition, and ability to meet the tasks and goals at hand, as well as their values, culture, and philosophy of which this result indicates that public universities in Ghana are no exception.

In addition, from the structural intellectual capital perspective, the number of publications by faculty of department/total publications of the school recorded the highest mean indicating that, there are structure which helps faculty members to increase their publications and ultimately attain their senior lectureship and professorial status in due time. The number of departmental seminars in a year recorded the second highest mean showing that most of the respondent agree that there is a lot of departmental seminars which influence the learning and research environment of the public universities in Ghana.

This finding confirms the assertion that organizational capital or structural of Beattie and Thomson (2007) who contributed to this idea, is the knowledge that remains within the company at the conclusion of the working day. This includes the

organizational practices, policies, frameworks, cultures, and databases. Culture, knowledge-based infrastructure, intellectual property, procedures, working methods and routines, and organizational route are five categories of structural capital that the authors highlighted. An organization with strong structural capital will foster an environment where human capital may be used and developed to the best extent possible, hence boosting its innovation capital and customer capital. From the theoretical perspective, the study is in line with the contingency theory of management accounting which assumes that there doesn't exist one single structure which helps organizations to grow but with the appropriate structures, staffs are likely to develop based on the contingency structures in place which is applicable to all entities.

Finally, with respect to relational capital which focuses on the intangible values present in relations an organisation has with business partners and other external parties that contribute to fulfill the public universities' needs and includes elements like the public university's reputation and student potential. From the result, the item with the highest mean is the Funds from industry/total budget for research with a mean followed by Number of documented department-sanctioned public engagements in media on scientific issues that concern the discipline of the department. This implies that the public universities in Ghana have a very good relational capital which is significant for being autonomous and self-financing. This finding supports Alcaniz et al., (2011) and Silvestri and Veltri, (2011) who posit that, the development of relationships between an organization and its surroundings is referred to as relational capital. Customers, middlemen, suppliers, interorganizational alliance partners, regulators, institutional figures, pressure groups, communities, creditors, and investors can all be developed in such partnerships (Marr, 2008). Additionally, it represents the

culmination of an organization's interactions, closeness, and relationships with both internal and external stakeholders (Chen, 2009). According to Rudez and Mihalic (2007), direct distribution channels, image and brand, and customer pleasure and loyalty make up relational capital.

4.2.2 Evaluation of the performance using the balance scorecard of public universities in Ghana

The Exploratory Factor Analysis (henceforth referred to as EFA) is a technique for data exploration and to determine the structure of factors to be analyzed. It is used to establish dimensionality and convergent validity of the relationship between items and constructs. To justify the application of factor analysis in this study, the measure of sampling adequacy, a statistical test to quantify the degree of inter-correlations among the variables (Hair et al., 1998) was used. The measure of sampling adequacy uses the Bartlett's Test of Sphericity (Bartlett's Test) and Kaiser-Meyer-Olkin (KMO). The Bartlett's Test should be significant ($p < 0.05$) for the factor analysis to be considered appropriate and the measure of sampling adequacy produces the KMO index that ranges from 0 to 1 and indicates that KMO more than 0.60 are considered appropriate for factor analysis (Pallant, 2001).

Table 4.5: Factor analysis of performance using the balance scorecard of public universities in Ghana

Factors/Items	Latent construct	Factor loading
Financial Measures	Operating budget of the department	0.793
	Budget allocation growth	0.777
	High patronizes of fee-paying programmes	0.712
	Increase in IGF from postgraduate programmes	0.849
	Net cash flows	0.755
	Costs per student	0.639
	Customer measures	Market share of Undergraduate students
Students' response time to admission		0.783
On-time feedback on assessment		0.637
Number of student complaints		0.731
Survey of student satisfaction		0.655
Internal Business Processes Measures	Materials efficiency variance	0.817
	Student graduation lead time	0.807
	Rate of material scrap loss	0.746
Innovation and Learning Measures	Labour efficiency variance	0.805
	Number of new patents	0.837
Learning Measures	Number of new programmes launches	0.871
	Time-to-market for new programmes	0.814
	Teaching and non-teaching staff satisfaction	0.709

Source: Fieldwork (2022)

In this study, factor analysis was merely performed for the 'Diversity of Measurement' variable (largely borrowed from Kaplan and Norton's BSC measures) since this construct contains new items classified under the heading of "Social and Environmental" perspective in addition to other four main perspectives of Kaplan and Norton's BSC measures. The three constructs of IC, namely Human Capital,

Structural Capital and Relational Capital were not subjected to PCA, in as much as they were already treated as four individual variables. Likewise, factor analysis was not conducted for “the balanced use of PMS” variable because each item was particularly designated for each PMS Use type. Besides, factor analysis was not used for performance measured by balance scorecard variable since there is an obvious distinction which performance is either nonfinancial or financial measures.

Consequently, factor analysis under the extraction method of principal component analysis with the rotation method of varimax with Kaiser Normalization was used for the 26 items of the diversity of performance measures to designate their groups based on the Balanced Scorecard’s four perspective in addition to a new perspective, that is social and environmental measurement which is regarded new in this study and includes seven measures. Varimax rotation was favored since it minimized the correlation across factors and maximized within the factors. This helped to yield ‘clear’ factors (Nunnally, 1978). In fact, this method is robust and able to simplify the factor loadings and supports the interpretation. Factor loading indicates the strength of the relationship between the item and the latent construct and thus, is used to ascertain the convergent and discriminant validity of the scales (Hair et al., 2006). Nunnally (1978) posits that items with loadings higher than 0.50 on one factor are retained for further analysis.

The results specify the Barlett Test of Sphericity (Barlett, 1954) met statistical significance (Chi-Square = 3160.988, $p < .01$) and the Kaiser-Meyer-Okin (KMO) measure of sampling adequacy was .880, greater than the recommended value of .60 (Kaiser, 1974). Accordingly, these results indicate that the factorability of the data is regarded appropriate. After running the factor analysis, five components’ factors were extracted with eigen values greater than 1, explaining a total of 76.7% of the variance,

with component 1 contributing 45.63%, component 2 contributing 14.2%, component 3 contributing 8.1%, component 4 contributing 4.92%, and component 5 contributing 3.93%.

From the results, all the indicators of the balance scored card showed that the public universities in Ghana are performing well from the perspective of all the indicators especially financial measures because from the result the budget allocation growth for each of the departments keeps on increasing. This implies that the departments have sufficient resources to develop new Programmes as well as encourage staffs to be trained in the areas of teaching and research materials. In addition, the increase in internally generated funds (IGF) recording the highest factor shows that public universities in Ghana are working hard to argument the financial support from government and might be financially sound in the future.

From the customer measure, students' response time to admission recorded the highest factor followed by increase in the number of students complain. This shows that the performance of the public universities firm the perspective of customers must be improved because if the students are your customers and they increase their complains, it means there will be a drop in referrals in future. From the perspective of internal business process measures and innovation and leaning measures, student graduation lead time and number of new Programmes recorded the highest factor which are excellent indicators that the public universities are improving in innovation and management of internal business. This finding supports the assertion of Kuper (2013) that the balanced scorecard Balanced Scorecard in Universities can be used as a tool for managing the operations of academic and non-academic university departments, as well as the mechanisms of budgeting and target agreements.

4.2.3 Estimation of the effect of intellectual capitals on the performance of public Universities in Ghana using the Balanced scorecard.

This section presents the result for the last objective of this study which is to investigate the effects of intellectual capital on the performance of public Universities in Ghana using the Balanced scorecard. To achieve this objective the Smart PLS result was used to determine the effect on Balanced scorecard (intellectual capital, socio-economic factors that is displayed in Table 4.6).

Table 4.6: Structural path significance in bootstrapping

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Socio Economic Factors -> Performance measured by balance scorecard	0.3598	0.3675	0.0785	4.5835	0.0000
Intellectual Capital -> Performance measured by balance scorecard	0.7992	0.8054	0.0440	18.1554	0.0000
Socio Economic Factors x Intellectual Capital -> Performance measured by balance scorecard	0.6549	0.6373	0.0852	7.6873	0.0000

Source: Field work (2023)

The result indicates that the coefficient of determination, R^2 is 0.971 for endogenous latent variables. This means that, the variables Socio Economic Factors and Intellectual Capital jointly explained 97.1% of the variance of the Performance measured by balance scorecard. The Smart PLS result also indicates the variables sequentially had path coefficient as follows; are 0.0698 for the effect of Socio-Economic Factors, 0.6549 for the effect of Intellectual Capital. Also, Table 4.6 displays structural path significance in bootstrapping, the outcome of Socio-Economic Factors on Performance measured by balance scorecard [$t=4.5835$, $P<0.05$] indicating

that the established positive effect of socio-economic factors on performance is statistically significant and that the socio economic factors influence the performance of the public universities, while the outcomes of the moderating role that Socio Economic Factors has on the effect of Intellectual Capital on Performance measured by balance scorecard [$t=7.6873$, $P<0.05$], and Intellectual Capital on Performance measured by balance scorecard [$t=18.1554$, $P<0.05$] were all statistically significant at 5%. The results indicate the direct effect of the variables on performance measured by balance scorecard.

The third objective of the study sought to determine estimate the effect of intellectual capitals on the performance of public Universities in Ghana using the Balanced scorecard. Form the findings, Socio-Economic Factors affect Performance has positive effect on the performance measured by balance scorecard [$t=4.5835$, $P<0.05$]. This means that age, level of education and gender influence the performance of the public universities in Ghana, this can be attributed to the social setting of our public universities which serves as the upper echelon of education in the country and that after the tertiary education one is seen to be socially responsible in the economy. The reason for the positive relationship between socio economic factors and performance is because as one claims through the level of education, one becomes more espoused and increase their intellect and since universities requires high intellect to make the students understand concepts. The findings also supported Tayles et al. (2002) who regarded internal management figures as defining and quantifying the responsibilities and influence of intellectual capital to turn into real strategic value. It is of more significance in modern companies to use the relevant treatment of intellectual capital within the function of management accounting. Focus has moved on from 'what we own' to 'what we know' and attempts to quantify

intangible assets are considered both a strategic challenge and a value adding activity. However, it must not be forgotten that real danger of converting intellectual assets into 'hidden' value is always present. Organizations that failed in engaging innovative and strategic PMS, or emphasized its evaluation, appraisal, and measurement, will neglect of what may prove be the organization's most valuable resource (Tayles et al., 2002).

Secondly, the outcomes of the moderating role that Socio Economic Factors has on the effect of Intellectual Capital on Performance measured by balance scorecard [$t=7.6873$, $P<0.05$]. This also indicates that socio economic factors positively influence how intellectual capital affect performance measured by balance scorecard. This means that the age, gender and level of education of the university staffs affects all the indicators of human, structural and relational intellectual capital directly and influence the performance of the public universities in Ghana. The result also indicates that Intellectual Capital affect Performance measured by balance scorecard [$t=18.1554$, $P<0.05$] positively in the sense that, as human intellectual, structural intellectual capital and relational intellectual capital improves the performance of the public universities in Ghana with a coefficient of 0.6549. This finding is consistent with empirical results which proved that the existence of a direct correlation between Intellectual Capital and corporate value. It is also in line with Bontis (2000) who posited that market orientation is embedded in the conceptualization of relational capital.

4.3 Model fit

Due to the sensitiveness of chi-square value to large samples, other fit indices such as standardized root mean square residual (SRMR), normed fit index (NFI),

squared Euclidean distance (d_{ULS}) and the geodesic distance (d_G) were also considered to test model fitness on the data collected. Hu and Bentler (1999) recommended that SRMR of value less than 0.08 is considered good fit. It is also an indication that, the hypothesized model is specified (Henseler et al., 2014). Bentler and Bonett (1980) asserted that, the NFI result in a value between 0 and 1, and that, the closer the NFI to 1, the better the fit. NFI valued above 0.9 represent acceptable fit. The d_{ULS} is based on bootstrap result of the exact model fit.

Table 4.7: Model fit

	Saturated model	Estimated model
SRMR	0.116	0.117
d_{ULS}	7.553	7.731
d_G	2.939	2.994
Chi-square	2941.423	2969.013
NFI	0.568	0.564

Source: Fieldwork (2022)

The d_{ULS} fit indices measure the difference between the correlation matrix implied by the hypothesized model and the empirical correlation matrix, and such difference should be significant ($p > 0.05$) to confirm the fitness of the measurement model (Dijkstra et al., 2015). The saturated model assesses correlation between all constructs. The estimated model is a model which is based on a total effect scheme and takes the model structure into account. It is hence a more restricted version of the fit measure. Based on the data from a sample of 223 respondents, the results show that the model for the study had a better fit to the data. The SRMR = 0.116 and 0.117, NFI = 0.568 and 0.564, Chi-square was 2941.423 and 2969.013. Bootstrap result for d_{ULS} showed a probability of acceptance at 7.553% and 7.731%, indicating an insignificant difference between the correlation matrix.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

From the analysis and data collected, the researcher was able to make conclusions and recommendations. The responses were in relation to the research questions and objectives of this study which sought to analyse the relationship between Intellectual Capital and Performance through the Perspective of Balanced Scorecard of public universities in Ghana.

5.2 Summary of Key Findings

The role of Intellectual Capital in the performance and progress of universities in the other parts of the world is obvious. Despite the increasing research into these relationships, there is little evidence that supports the impact of Intellectual Capital on performance in the education sector in Africa and in Ghana especially from the perspective of the balance scorecard. This study therefore seeks to investigate the relationship that exists between Intellectual Capital and performance of public Universities in Ghana from the balance scorecard perspective to redress the Intellectual Capital issue in University in Ghana. The purpose of this study is to explore comparatively, the relationship between intellectual capitals and performance of public Universities in Ghana from the Balance Scorecard Perspective. The objectives were to assess the intellectual capitals of public universities in Ghana, evaluate the performance of public universities using the Balanced scorecard and finally to estimate the effect of intellectual capitals on the performance of public Universities in Ghana using the

Balanced scorecard. The study is supported by the dynamic theory of intellectual capital and the contingency theory.

The study adopted the descriptive causal research design to collect detailed and information that describe objectives of this study which examining the relationship between intellectual capital for public universities from the balanced scorecard perspective. For the purpose of the study, all public universities which are over 25 years were used and are within the Middlebelt and Southern zone of Ghana were considered for the study. Against this backdrop, the public universities considered were University of Ghana (UG), University of Cape Coast (UCC), Kwame Nkrumah University of Science and Technology (KNUST) and University of Education, Winneba (UEW). According to basic statistic for graduation for these universities, there are about 321 Heads of Department in these public universities. The Yamane (1967) model was used to determine the sample size and from the model 178 head of departments were used for the study. A structured data-collection approach was used for the study and always operates with a formal written instrument known as a structured interview schedule or a questionnaire guide. Factor analysis and the structural equation model were used to analyze the data for discussion.

1. From the results, the first objective of the study which sought to assess the Intellectual Capital of Public Universities in Ghana. The findings of the study revealed that majority of the respondents asserted and agreed that for the public universities have a very high intellectual capital. In relation to the specifics, with respect to human intellectual capital, the number of conferences attended by Lecturers/Number of lecturers recorded the highest meanwhile the next highest means was the number of book chapters published by faculty/ total departmental faculty strength which explains that the human capital base of the public

universities in Ghana are very high because attending conferences and publishing book chapters requires very high intellect. This implies that with the human intellectual capital, teaching staff of the public universities can easily get promotion because they could publish which is a main yardstick for promotion in the public universities in Ghana. The result also means that soon most of the public universities in Ghana will be rated high due to the visibility of the universities through the publications of their lecturers.

2. For the second objective of the study which evaluated the performance using the balance scorecard of public universities in Ghana. From the results, all the indicators of the balance scored card showed that the public universities in Ghana are performing well from the perspective of all the indicators especially financial measures because from the result the budget allocation growth for each of the departments keeps on increasing. This implies that the departments have sufficient resources to develop new Programmes as well as encourage staffs to be trained in the areas of teaching and research materials. In addition, the increase in internally generated funds (IGF) recording the highest factor shows that public universities in Ghana are working hard to argument the financial support from government and might be financially sound in the future.

From the customer measure, students' response time to admission recorded the highest factor followed by increase in the number of students complain. This shows that the performance of the public universities firm the perspective of customers must be improved because if the students are your customers and they increase their complains, it means there will be a drop in referrals in future. From the perspective of internal business process measures and innovation and leaning measures, student graduation lead time and number of new Programmes

recorded the highest factor which are excellent indicators that the public universities are improving in innovation and management of internal business.

3. Finally, the result for the third objective indicated that Socio-Economic Factors affect Performance has positive effect on the performance measured by balance scorecard. This means that age, level of education and gender influence the performance of the public universities in Ghana, this can be attributed to the social setting of our public universities which serves as the upper echelon of education in the country and that after the tertiary education one is seen to be socially responsible in the economy. Also, the outcomes of the moderating role that Socio Economic Factors has on the effect of Intellectual Capital on Performance measured by balance scorecard. This also indicated that socio economic factors positively influence how intellectual capital affect performance measured by balance scorecard. This means that the age , gender and level of education of the university staffs affects all the indicators of human, structural and relational intellectual capital directly and influence the performance of the public universities in Ghana. Finally, from the result, Intellectual Capital affect Performance measured by balance scorecard positively in the sense that, as human intellectual, structural intellectual capital and relational intellectual capital improves the performance of the public universities

5.3 Conclusions

The general objective of this study was to identify the relationship of intellectual capital being carried out at the public universities in Ghana, it associated with balanced scorecard and its effects on performance and also to discover how this perspective

could be gained from the application of balanced scorecard and from the research findings and analysis, from the results it is concluded that with respect to human intellectual capital, the number of conferences attended by Lecturers/Number of lecturers is recommendable the while the number of book chapters published by faculty/ total departmental faculty strength are very high because attending conferences and publishing book chapters requires very high intellect.

In addition, it is concluded that, all the indicators of the balance scored card showed that the public universities in Ghana are performing well from the perspective of all the indicators especially financial measures because from the result the budget allocation growth for each of the departments keeps on increasing. This implies that the departments have sufficient resources to develop new Programmes as well as encourage staffs to be trained in the areas of teaching and research materials. In addition, the increase in internally generated funds (IGF) recording the highest factor shows that public universities in Ghana are working hard to argument the financial support from government and might be financially sound in the future.

Finally, it is concluded that, Socio-Economic Factors affect Performance has positive effect on the performance measured by balance scorecard while the moderating role that Socio Economic Factors has a positive effect on how Intellectual Capital affect performance measured by balance scorecard hence if the socio-economic factors are improved, the performance of public universities increases. It is also concluded that, socio economic factors positively influence how intellectual capital affect performance measured by balance scorecard.

5.4 Recommendations

From the summary and conclusion, the study recommends that

1. From the study all the components of intellectual capital of the public universities are high but much attention should be paid to the human intellectual capital and structural capital development to sustain improved growth in the public universities in Ghana.
2. All the components of the balance scorecard of the public universities are encouraging but structures should be instituted to resolve the complains from the students quickly.
3. The level of education and other socio-economic factors should be improved since they directly affect the intellectual capital which eventually affect the performance of public universities in Ghana.

5.5 Suggestions for Further Studies

From the general objective of the study and the research findings, the researcher suggests further studies be done on challenges been faced by intellectual in other industries, Also comparative analysis of the effect of intellectual capital on the performance of private and public universities should be carried out for a more holistic perspective.

REFERENCES

- Aaker, David A, Kumar, V, & Day, George S. (2007). *Marketing research*: Wiley Hoboken, NJ.
- Abdallah, Wagdy Moustafa. (2001). *Managing multinationals in the Middle East: Accounting and tax issues*: Greenwood Publishing Group.
- Abernethy, Margaret A, & Bouwens, Jan. (2005). Determinants of accounting innovation implementation. *Abacus*, 41(3), 217-240.
- Addision Wesley. Ariely, G. (2003). Knowledge management as a methodology towards intellectual capital. 3rd European knowledge management summer school, 7-12.
- Adrian, (2015). Effect of Position, Age, Experience, Level of Education and Skill on the Effectiveness of Accounting Information Systems at PT. PLN (Persero) South Bali Area. *Encryption*, Mahasaraswati University.
- Agarwal, Ritu, & Karahanna, Elena. (2000). Time flies when you're having fun: cognitive absorption and beliefs about information technology usage 1. *MIS quarterly*, 24(4), 665-694.
- Al-Tahat, S. S., Matarneh, A. J., & Ali, O. A. M. (2019). The impact of the intellectual capital of the university administration in achieving the quality of education. *International Journal of Economics and Finance*, 11(2), 137-154.
- Alavi, Maryam, & Leidner, Dorothy E. (2001). Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS quarterly*, 107-136.
- Alavi, Maryam, Kayworth, Timothy R, & Leidner, Dorothy E. (2006). An empirical examination of the influence of organizational culture on knowledge management practices. *Journal of Management Information Systems*, 22(3), 191-224.
- Aldrich, Howard, & Auster, Ellen R. (1986). Even dwarfs started small: Liabilities of age and size and their strategic implications. *Research in organizational behavior*.
- Amaratunga, Dilanthi, Baldry, David, & Sarshar, Marjan. (2001). Process improvement through performance measurement: the balanced scorecard methodology. *Work Study*, 50(5), 179-189.
- Amason, Allen C. (1996). Distinguishing the effects of functional and dysfunctional conflict on strategic decision making: Resolving a paradox for top management teams. *Academy of management journal*, 39(1), 123-148.

- Amidu, M. (2017). E-Accounting Practices among Small and Medium Enterprises in Ghana. *Journal of Management Policy and Practice*, 12(4), 152 -185.
- Amir, Eli, & Lev, Baruch. (1996). Value-relevance of nonfinancial information: The wireless communications industry. *Journal of accounting and economics*, 22(1), 3-30.
- Amit, Raphael, & Schoemaker, Paul JH. (1993). Strategic assets and organizational rent. *Strategic management journal*, 14(1), 33-46.
- Andaleeb, Syed Saad. (1996). An experimental investigation of satisfaction and commitment in marketing channels: the role of trust and dependence. *Journal of retailing*, 72(1), 77-93.
- Anderson, Erin, & Weitz, Barton. (1992). The use of pledges to build and sustain commitment in distribution channels. *Journal of marketing research*, 18-34. 301
- Anderson, James C, & Gerbing, David W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological bulletin*, 103(3), 411.
- Andriessen, Daniel. (2004). IC valuation and measurement: classifying the state of the art. *Journal of intellectual capital*, 5(2), 230-242.
- Anggraini, F., Abdul-Hamid, M. A., & Azlina, M. K. A. (2018). The Role of Intellectual Capital on Public Universities Performance in Indonesia. *Pertanika Journal of Social Sciences & Humanities*, 26(4).
- Annie. (1996). *Intellectual capital*: Thomson Learning. Buckman,
- Anthony, Robert Newton. (1965). *Planning and control systems: a framework for analysis*.
- Argote, Linda, & Ingram, Paul. (2000). Knowledge transfer: A basis for competitive advantage in firms. *Organizational behavior and human decision processes*, 82(1), 150-169.
- Argote, Linda, McEvily, Bill, & Reagans, Ray. (2003). Managing knowledge in organizations: An integrative framework and review of emerging themes. *Management science*, 49(4), 571-582.
- Argyris, Chris, & Schon, Donald. (1978). *Organizational Learning: A theory of action approach*. Reading, MA:
- Ariani, NN.A., (2010). Effects of Gender, Position, Age, Experience, Complexity, Tasks and Level of Education on the Effectiveness of Accounting Information

- Systems at PT. Flamboyan Creations in Denpasar. Thesis, Warmadewa University.
- Arora, Ashish, & Gambardella, Alfonso. (1990). Complementarity and external linkages: the strategies of the large firms in biotechnology. *The Journal of Industrial Economics*, 361-379.
- Astley, W Graham, & Fombrun, Charles J. (1983). Collective Strategy: Social Ecology of Organizational Environments. *Academy of management review*, 8(4), 576-587.
- Atkinson, Anthony A, Waterhouse, John H, & Wells, Robert B. (1997). A stakeholder approach to strategic performance measurement. *Sloan management review*, 38(3), 25-37.
- Atkinson, Anthony, Banker, Rajiv D, Kaplan, Robert S, & Young, SM. (1995). *Management Accounting* Prentice Hall. Englewood, Cliffs, NJ.
- Atkinson, Giles. (2000). Measuring corporate sustainability. *Journal of Environmental Planning and management*, 43(2), 235-252.
- Awan, A. G., & Saeed, K. (2014). Intellectual capital and research performance of universities in southern Punjab-Pakistan. *European Journal of Business and Innovation Research*, 2(6), 21-39.
- Bacon, Donald R, Sauer, Paul L, & Young, Murray. (1995). Composite reliability in structural equations modeling. *Educational and Psychological Measurement*, 55(3), 394-406.
- Bagozzi, Richard P, & Edwards, Jeffrey R. (1998). A general approach for representing constructs in organizational research. *Organizational Research Methods*, 1(1), 45-87.
- Bagozzi, Richard P, & Heatherton, Todd F. (1994). A general approach to representing multifaceted personality constructs: Application to state self-esteem. *Structural Equation Modeling: A Multidisciplinary Journal*, 1(1), 35-67. 302
- Baines, Annette, & Langfield-Smith, Kim. (2003). Antecedents to management accounting change: a structural equation approach. *Accounting, organizations and society*, 28(7), 675-698.
- Baker, Kathryn A. (2002). *Organizational Culture*. Balogun, Julia, & Jenkins, Mark. (2003). Re-conceiving change management:: A knowledge-based perspective. *European Management Journal*, 21(2), 247-257.
- Baker, R. J. (2008), *Mind Over Matter: why intellectual capital is the chief source of wealth*, John Wiley & Sons, Hoboken, New Jersey.

- Banker, Rajiv D, Potter, Gordon, & Srinivasan, Dhinu. (2000). An empirical investigation of an incentive plan that includes nonfinancial performance measures. *The Accounting Review*, 75(1), 65-92.
- Barbosa, S., Vale, J., Teixeira Vale, V., & Castelo Branco, M. (2016). Intellectual capital and performance in higher education organizations. In *Proceedings of the International Conference Theory and Application in the Knowledge Economy (TAKE 2016)* (pp. 670-681).
- Barclay, Donald, Higgins, Christopher, & Thompson, Ronald. (1995). The partial least squares (PLS) approach to causal modeling: personal computer adoption and use as an illustration. *Technology studies*, 2(2), 285-309.
- Barney, Jay. (1991). Firm resources and sustained competitive advantage. *Journal of management*, 17(1), 99-120.
- Baron, Reuben M, & Kenny, David A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, 51(6), 1173.
- Barrett, M Edgar, & Fraser, LB. (1977). Conflicting roles in budgeting for operations. *Harvard Business Review*, 55(4), 137-146.
- Barsky, N. P, & Bremser, Wayne G. (1999). Performance measurement, budgeting and strategic implementation in the multinational enterprise. *Managerial Finance*, 25(2), 3-15.
- Bartlett, JE, & Kotrlik, J. W. & Higgins, CC (2001). *Organizational Research Determining Appropriate Sample Size in Survey Research*, 43-50.
- Baumgartner, Hans, & Homburg, Christian. (1996). Applications of structural equation modeling in marketing and consumer research: a review. *International Journal of Research in Marketing*, 13(2), 139-161.
- Beattie, V., & Thomson, S. J. (2007). Lifting the lid on the use of content analysis to investigate intellectual capital disclosures. *Accounting Forum*, 31, 129–163.
- Becker, T. E, Billings, Robert S, Eveleth, Daniel M, & Gilbert, Nicole L. (1996). Foci and bases of employee commitment: Implications for job performance. *Academy of management journal*, 39(2), 464-482.
- Behling, Orlando, & Law, Kenneth S. (2000). *Translating questionnaires and other research instruments: Problems and solutions (Vol. 133)*: SAGE Publications, Incorporated.

- Bentler, P. M., & Huang, W. (2014). On components, latent variables, PLS and simple methods: Reactions to ridge's rethinking of PLS. *Long Range Planning*, 47 (3), 138–154.
- Bentler, PM, & Wu, EJC. (1995). EQS for Macintosh user's guide. Encino. CA: Multivariate Software: Inc.
- Berry, John. (2004). Tangible Strategies for Intangible Assets: How to Manage and Measure Your Company's Brand, Patents, Intellectual Property, and Other Sources of Value: McGraw-Hill Companies. 303
- Bezhani, I. (2010), "Intellectual capital reporting at UK universities", *Journal of Intellectual Capital*, Vol. 11 No. 2, pp. 179-207.
- Bhimani, Alnoor, & Langfield-Smith, Kim. (2007). Structure, formality and the importance of financial and non-financial information in strategy development and implementation. *Management Accounting Research*, 18(1), 3-31.
- Bhimani, Alnoor. (2003). A study of the emergence of management accounting system ethos and its influence on perceived system success. *Accounting, Organizations and Society*, 28(6), 523-548.
- Bieker, Thomas, & Waxenberger, Bernhard. (2002). Sustainability balanced scorecard and business ethics. Paper presented at the greening of industry network conference.
- Bierly, P, & Daly, Paula. (2002). Aligning human resource management practices and knowledge strategies. *The strategic management of intellectual capital and organizational knowledge*, 277-295.
- Bigley, Gregory A, & Pearce, Jone L. (1998). Straining for shared meaning in organization science: Problems of trust and distrust. *Academy of Management Review*, 23(3), 405-421.
- Birnberg, JG. (1998). Some reflections on the evolution of organizational control. *Behavioral Research in Accounting*, 10, 27-46.
- Bisbe, J., & Malagueo, R. (2015). How control systems influence product innovation process: The role of entrepreneurial orientation. *Accounting and Business Research*, 45(3) 356-386. <http://doi.org/10.1080/00014788.2015.1009870>.
- Bisbe, Josep, & Otley, David. (2004). The effects of the interactive use of management control systems on product innovation. *Accounting, organizations and society*, 29(8), 709-737.
- Bisbe, Josep, Batista-Foguet, Joan-Manuel, & Chenhall, Robert. (2007). Defining management accounting constructs: a methodological note on the risks of

- conceptual misspecification. *Accounting, organizations and society*, 32(7), 789-820.
- Bontis, Nick, & Fitz-Enz, Jac. (2002). Intellectual capital ROI: a causal map of human capital antecedents and consequents. *Journal of Intellectual Capital*, 3(3), 223-247.
- Bontis, Nick, & Girardi, John. (2000). Teaching knowledge management and intellectual capital lessons: an empirical examination of the TANGO simulation. *International Journal of Technology Management*, 20(5), 545-555.
- Bontis, Nick, and Fitz-enz, Jac (2002). "Intellectual capital ROI: a causal map of human capital antecedents and consequents," *Journal of Intellectual Capital*, 3(3):223-247; available at <https://doi.org/10.1108/14691930210435589>
- Bontis, Nick, Crossan, Mary M, & Hulland, John. (2002). Managing an organizational learning system by aligning stocks and flows. *Journal of management studies*, 39(4), 437-469.
- Bontis, Nick, Dragonetti, Nicola C, Jacobsen, Kristine, & Roos, Göran. (1999). The knowledge toolbox:: A review of the tools available to measure and manage intangible resources. *European management journal*, 17(4), 391-402. 304
- Bontis, Nick, Keow, William Chua Chong, & Richardson, Stanley. (2000). Intellectual capital and business performance in Malaysian industries. *Journal of intellectual capital*, 1(1), 85-100.
- Bontis, Nick. (1998). Intellectual capital: an exploratory study that develops measures and models. *Management decision*, 36(2), 63-76.
- Bontis, Nick. (1999). Managing organisational knowledge by diagnosing intellectual capital: framing and advancing the state of the field. *International Journal of technology management*, 18(5), 433-462.
- Bontis, Nick. (2001). Assessing knowledge assets: a review of the models used to measure intellectual capital. *International journal of management reviews*, 3(1), 41-60.
- Bontis, Nick. (2004). National intellectual capital index: a United Nations initiative for the Arab region. *Journal of Intellectual Capital*, 5(1), 13-39.
- Bourgeois, L Jay, & Eisenhardt, Kathleen M. (1988). Strategic decision processes in high velocity environments: four cases in the microcomputer industry. *Management science*, 34(7), 816-835.
- Bourne, MCS, & Bourne, PA. (2000). *Understanding the Balanced Scorecard in a week*: Hodder & Stoughton.

- Bourne, Mike, Mills, John, Wilcox, Mark, Neely, Andy, & Platts, Ken. (2000). Designing, implementing and updating performance measurement systems. *International Journal of Operations & Production Management*, 20(7), 754-771.
- Bozbura, F. T., & Beskese, A. (2007). Prioritization of organizational capital measurement indicators using fuzzy AHP. *International Journal of Approximate Reasoning*, 44, 124–147.
- Bozbura, F. T., Beskese, A., & Kahraman, C. (2007). Prioritization of human capital measurement indicators using fuzzy AHP. *Expert Systems with Applications*, 32, 1100–1112
- Bratianu, Constantin, Jianu, Ionela, & Vasilache, Simona. (2011). Integrators for organisational intellectual capital. *International Journal of Learning and Intellectual Capital*, 8(1), 5-17.
- Bratianu, Constantin. (2007). The learning paradox and the university. *Journal of Applied Quantitative Methods*, 2(4), 375-386.
- Brislin, Richard W. (1970). Back-translation for cross-cultural research. *Journal of cross-cultural psychology*, 1(3), 185-216. Brockman, B
- Burchell, Stuart, Clubb, Colin, Hopwood, Anthony, Hughes, John, & Nahapiet, Janine. (1980). The roles of accounting in organizations and society. *Accounting, Organizations and Society*, 5(1), 5-27. Burns, Robert B, & Bursn, Robert B. (2000). Introduction to research methods.
- Chu, P. Y., Lin, Y. L., Hsiung, H. H., & Liu, T. Y. (2006). Intellectual capital: An empirical study of ITRI. *Technological Forecasting & Social Change*, 73, 886–902.
- Cricelli, L., Greco, M., Grimaldi, M., & Dueñas, L. P. L. (2018). Intellectual capital and university performance in emerging countries: evidence from Colombian public universities. *Journal of Intellectual Capital*.
- European Commission (2005b), RICARDIS (Reporting Intellectual Capital to Augment Research, Development and Innovation in SME's).
- everly K, & Morgan, Robert M. (2003). The role of existing knowledge in new product innovativeness and performance. *Decision Sciences*, 34(2), 385- 419. Brooking,
- Galbraith, J.K. (1969), *The New Industrial State*, Penguin, Harmondsworth.
- Greenfield, T. (2016). *Research methods for postgraduates* (3rd ed.). UK: John Wiley & Sons, Ltd

- Guthrie, J. and Petty, R. (2000), The Annual Reporting of Intellectual Capital in Australia's Largest Companies, Australian CPA.
- Hair, J. F., Sarstedt, M., Pieper, T., Ringle, C. M., & Mena, J. A. (2012). The use of partial least squares structural equation modelling in strategic management research: A review of past practices and recommendations for future applications. *Long Range Planning*, 45(5–6), 320–340. <https://doi.org/10.1016/j.lrp.2012.09.008>.
- Hair, J., Sarstedt, M., Ringle, C., & Mena, J. (2012). An assessment of the use of partial least squares structural equation modelling in marketing research. *Journal of the Academy of Marketing* 40, 414 -433. <https://doi.org/10.1007/s11747-011-0261-6>.
- Hristov, I. and Chirico, A. (2016) The Limits of the Balanced Scorecard. *Open Journal of Socia Sciences*, 4, 53-58. <http://dx.doi.org/10.4236/jss.2016.411004>
- Ji, X. X. (2019). Analyzed the Influence of Intellectual Capital on the Value Creativity of State-Owned Enterprises. *Modern Marketing (Late Edition)*, 1, 165-166.
- Johansson. Ulf, Mårtensson, Maria and Skoog, Matti (2001). "Measuring to understand Intangible performance drivers ", *European Accounting Review*, (10)3: 407-437
- Joia, L. A. (2007), *Strategies for Information Technology and Intellectual Capital: Challenges and Opportunities*, Information science reference, Hershey,PA.
- Joia, L.A. (2000), "Measuring intangible corporate assets", *Journal of Intellectual Capital*, Vol. 1 No. 1, pp. 68-84.
- Kaplan, R.S. (2011), "Accounting scholarship that advances professional knowledge and practice", *Accounting Review*, Vol. 86 No. 2, pp. 367-83.
- Kaplan, R.S. and Norton, D.P. (1996a), "Linking the balanced scorecard to strategy", *California Management Review*, Fall, pp. 53-79.
- Kaplan, R.S. and Norton, D.P. (1996b), *The Balanced Scorecard*, Harvard Business School Press, Boston, MA.
- Kaplan, R.S. and Norton, D.P. (2001a), *The Strategy Focused Organisation*, Harvard Business School Press, Boston, MA.
- Kaplan, R.S. and Norton, D.P. (2001b), "Transforming the balanced scorecard from performance measurement to strategic management: part I", *Accounting Horizons*, Vol. 15 No. 1, pp. 87-104.

- Kaplan, R.S. and Norton, D.P. (2001c), “Transforming the balanced scorecard from performance measurement to strategic management: part II”, *Accounting Horizons*, Vol. 12 No. 2, pp. 147-60.
- Kaplan, R.S. and Norton, D.P. (2004), “How strategy maps frame an organisation’s objectives”,
- Kaya, F. B., Sahin, G. G., & Gurson, P. (2010). Intellectual capital in organizations. *Problems and Perspectives In Management*, 8(1).
- Khalique, M., Bontis, N., Shaari, J. et al. (2015). Intellectual Capital in Small and Medium Enterprises in Pakistan. *Journal of Intellectual Capital*, 16, 224-238. <https://doi.org/10.1108/JIC-01-2014-0014>
- Kim, D. Y., & Kumar, V. (2009). A framework for prioritization of intellectual capital indicators in R & D. *Journal of Intellectual Capital*, 10(2), 277-293.
- Kim, T. , Yoo, J. J. E., & Lee, G. (2010). The HOINCAP scale: measuring intellectual capital in the hotel industry. *The Service Industries Journal*, First published on: 28 September 2010 (iFirst).
- Kumar, B. R. & Sujit, K. S. (2018). Determinants of dividends among Indian firms - An empirical study. *Cogent Economics & Finance*, 6(1),1423895.
- Lee, S. H. (2010). Using fuzzy AHP to develop intellectual capital evaluation model for assessing their performance contribution in a university. *Expert Systems with Applications*, 37, 4941–4947.
- Leontiades, J. C (2001). “Managing the Global Enterprise,” Harlow, England, Prentice Hall.
- Lev, B. (2001), *Intangibles: Management, Measurement, and Reporting*, Brookings Institution Press, Washington, DC.
- Liu, F., Ding, Y. W., Wu, W. J., Wang, N. N., & Fang, H. L. (2018). Content and Measurement Model of Enterprise Intellectual Capital. *Manager Journal*, 10,
- Low, M., Samkin, G. and Li, Y. (2015), “Voluntary reporting of intellectual capital: comparing the quality of disclosures from New Zealand, Australian and United Kingdom universities”, *Journal of Intellectual Capital*, Vol. 16 No. 4, pp. 779-808.
- Lu, W. M., Wang, W. K., Tung, W. T., & Lin, F. (2010). Capability and efficiency of intellectual capital: The case of fables companies in Taiwan. *Expert Systems with Applications*, 37, 546–555.

- Lytras, M. D., & Pablos, P. O. (2009). *Knowledge Ecology in Global Business: Managing Intellectual Capital*. Information science reference, Hershey, PA.
- Marr, B. (Ed.) (2005), *Perspectives on Intellectual Capital. Multidisciplinary Insights into Management, Measurement and Reporting*, Elsevier, Oxford.
- Martinez-Torres, M.R. (2006). A procedure to design a structural and measurement model of intellectual capital: An exploratory study. *Information & Management*, 43, 617–626.
- Meca, E. G., & Martinez, I. (2007). The use of intellectual capital information in investment decisions: An empirical study using analyst reports. *The International Journal of Accounting*, 42, 57–81.
- Montequín, V. R., Fernández, F. O., Cabal, V. A., & Gutierrez, N. R. (2006). An integrated framework for intellectual capital measurement and knowledge management implementation in small and medium-sized enterprises. *Journal of Information Science*, 32(6), 525–538.
- Nitzl, C. (2016). The use of partial least squares structural equation modelling (PLS-SEM) in management accounting research: Directions for future theory development. *Journal of Accounting Literature*, 37, 19–35.
- Omowumi, O. E. (2018). *Impact of Intellectual Capital on the Performance of Public Universities in Nigeria: Evidence From University Of Ilorin* (Doctoral dissertation, Kwara State University (Nigeria)).
- Peppard, J., & Rylander, A. (2001). Using an Intellectual Capital Perspective to Design and Implement a Growth Strategy: The Case of APiON. *European Management Journal*, 19(5), 510–525.
- Pramod, D., & Raman, R. (2014). A study on the user perception and awareness of smartphone security. *International Journal of Applied Engineering Research*, 9(23), 19133-19144.
- Ramezan, M. (2011). Intellectual capital and organizational organic structure in knowledge society: How are these concepts related? *International Journal of Information Management*, 31, 88–95.
- Ramírez Córcoles, Y., Tejada, A. and Manzaneque, M. (2016), “The value of disclosing intellectual capital in Spanish universities: a new challenge of our days”, *Journal of Organizational Change Management*, Vol. 29 No. 2, pp. 176-198.
- Ramírez, Y., Tejada, A., & Gordillo, S. (2013). Recognition of intellectual capital importance in the university sector. *International Journal of Business and Social Research*, 3(4).

- Robert H. (2004). *Building a knowledge-driven organization*: McGraw-Hill Blacklick, OH.
- Roos, J., Roos, G., Dragonetti, N. and Edvinsson, L. (1997), *Intellectual Capital: Navigating in the New Business Landscape*, Macmillan Business, London.
- Rudez, H. N., & Mihalic, T. (2007). Intellectual capital in the hotel industry: A case study from Slovenia. *Hospitality Management*, 26, 188–199.
- Sánchez, M. P., & Elena, S. (2006). Intellectual capital in universities: Improving transparency and internal management. *Journal of intellectual capital*.
- Sánchez, P., Elena, S., & Castrillo, R. (2007, September). The ICU Report: An Intellectual capital proposal for university strategic behaviour. In *IMHE Conference, Paris, France, September* (pp. 3-4).
- Sanjoy, Bose and Thomas, Keith (2007). “Applying the balanced scorecard for better performance of intellectual capital,” *Journal of Intellectual Capital*, (8)4:653665.
- Shih, K. H., Chang, C. J., & Lin, B. (2010). Assessing knowledge creation and intellectual capital in banking industry. *Journal of intellectual capital*.
- Siboni, B., Nardo, M.T. and Sangiorgi, D. (2013), “Italian state university contemporary performance plans: an intellectual capital focus?”, *Journal of Intellectual Capital*, Vol. 14 No. 3, pp. 414-430.
- Siltaoja, M. E. (2014). Revising the corporate social performance model–towards knowledge creation for sustainable development. *Business Strategy and the environment*, 23(5), 289-302.
- Tai, W. S., & Chen, C. T. (2009). A new evaluation model for intellectual capital based on computing with linguistic variable. *Expert Systems with Applications*, 36, 3483–3488.
- Wall, A. (2005). The measurement and management of intellectual capital in the public sector. *Public Management Review*, 7(2), 289-303.
- Wang, Y., Kannan, K. and Ulmer, J. (2015), The association between the disclosure and the realization of information security risk factors *Information Systems Research*, 24 (2), 201-218.
- Wong, K. K. (2013). Partial Least Squared Structural Equation Modelling (PLS-SEM) Techniques using SmartPLS. *Marketing Bulletin*, 24(1), 1-32.
- Xu, H., S. G., Haislip, J. Z. and Pinsker, R.E. (2019). Earnings management in firms with data security breaches. *Journal of Information System* 33 (3): 267-284. <https://doi.org/10.2308/isys-52480>

Zerr, A. A., & Aaqoulah, A. (2021). The Impact of Intellectual Capital on Job Performance based on Faculty Members' Perceptions at Universities. *International Business Research*, 14(7), 1-1.



APPENDIX

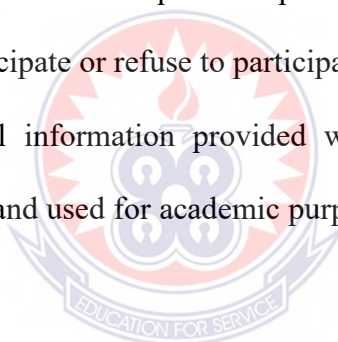
Questionnaire

UNIVERSITY OF EDUCATION, WINNEBA

DEPARTMENT OF HOME ECONOMICS

Dear Sir/ Madam

My name is Christiana Adarkwa, a Master of Business Administration (Accounting Option) student at University of Education, Winneba. I am conducting a study the intellectual capital and performance from the balance scorecard perspective among public universities in Ghana and you have been randomly selected for this study. I therefore plead with you to answer the questions posed as best as you can. There are no damages to you if you participate or refuse to participate and there are no wrong or right answers in this study. All information provided will be treated with the strictest confidentiality, anonymity and used for academic purposes only. Your kind cooperation will be most appreciated.



Thank you.

Part A: Socio-Demographic characteristics

1. Gender: Male () Female ()

2. Age:

3. Marital status:

Not married () Married () Divorced () Widow / Widower () Separated ()

other (specify)

4. Religion: Muslim () Christian () Traditional () other (specify)

SECTION B: HUMAN INTELLECTUAL CAPITAL

Please tick from 1 to 5 with 1= Highly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree;

5 = Highly Agree

[Human intellectual capital performance is defined to mean “performance of intellectual resources embedded in the departments’ work force”]

Your responses in this section would help us develop a standardize performance matrix of human intellectual capital performance of your department. For each item, tick the level of importance in assessing human intellectual capital performance of your department.

A space is provided for you to indicate any item you consider important yet has not been included in the list.

No.	Human intellectual capital performance indicators	1	2	3	4	5
HC ₁	Number of faculty promotions in a year/Total number of faculty in the department					
HC ₂	Total funds allocated to the department for research and development (R&D)/number of researchers in the department					
HC ₃	Number of PhD students/number of researchers					
HC ₄	Number of researchers/numbers of administrative personnel					
HC ₅	Number of PhD students coming from other universities/total number PhD students					
HC ₆	Amount of departmental research budget managed at the business school level/ departmental research budget					
HC ₇	Research grant won by faculties/total research budget					
HC ₈	Proportion of faculty appointed through department to total faculty posted to the department					
HC ₉	Number of intra department publication collaboration					
HC ₁₀	Number of publications of department’s faculty on the universities’ website/total number of publications by faculties in the department					
HC ₁₁	Number of book chapters published by faculty/ total departmental faculty strength					

HC ₁ 2	Proportion of non-tuition income of the department to total departmental revenue base					
HC ₁ 3	Number of conferences attended by Lecturers/Number of lecturers					

5.

SECTION C: STRUCTURAL INTELLECTUAL CAPITAL

[Structural intellectual capital performance is defined to mean “performance of intellectual resources embedded in the departments’ systems and structures”]

Your responses in this section would help us develop a standardize performance matrix of structural intellectual capital performance of your department. For each item, tick the level of importance in assessing human intellectual capital performance of your department.

A space is provided for you to indicate any item you consider critical, yet has not been included in the list.

Structural intellectual capital indicators	1	2	3	4	5
SC ₁ : Number of publications by faculty of department/total publications of the school					
SC ₂ : Number of active patents owned by the department/total number of active patents by school					
SC ₃ : Number of active patents produced by the department					
SC ₄ : Returns from patents and intellectual rights of the department/total returns from patents by the school of business					
SC ₅ : Returns from patents and intellectual rights of the department					
SC ₆ : Number of departmental seminars in a year					
SC ₇ : Verifiable mechanisms to evaluate performance of department on its strategic research plan/theme					
SC ₈ : Proportion of alumni from the department taking graduate courses at the department					
SC ₉ : Proportion of graduate students (over total number of students’ at the department)					

SECTION D: RELATIONAL INTELLECTUAL CAPITAL PERFORMANCE

Relational intellectual capital performance is defined to mean “performance of intellectual resources embedded in relationships external to the department”

Your responses in this section would help us develop a standardize performance matrix of relational intellectual capital performance of your department. For each item, tick the level of importance in assessing human intellectual capital performance of your department.

A space is provided for you to indicate any item you consider critical, yet has not been included in the list.

Relational intellectual capital performance indicators	1	2	3	4	5
RC ₁ : Number of spin-offs supported by the department					
RC ₂ : Number of spin-offs funded by the department/the total number of spin-offs by the business school					
RC ₃ : Number of contracts with industry					
RC ₄ : Number of contracts with public organisations by department/total comparable number for business school					
RC ₅ : Number of successful research collaboration between departmental faculties with researchers outside the university					
RC ₆ : Funds from industry/total budget for research					
RC ₇ : Evidence of existence of a technology transfer institution for intellectual property management					
RC ₈ : Total appointments of faculty to national and international standards setting committees					
RC ₉ : Total number of position papers, policy drafts, consultancy (of national character) that emanates from the department					
RC ₁₀ : Number of committees served on by faculties of the department in the university (excluding those of business school)					
RC ₁₁ : Number of documented position papers, policy drafts by departmental faculty to immediate university community					
RC ₁₂ : Number of times the departmental faculty involved in social and cultural life					
RC ₁₃ : Number of times the departmental faculty involved in a sporting event (excluding department specific sporting events)					
RC ₁₄ : Number of documented department-sanctioned public engagements in media on scientific issues that concern the discipline of the department					

RC ₁₅ : Number of existing collaborations with government, industry, Alumni and other stakeholders					
RC ₁₆ Number of conference collaborations with other universities by the department					
RC ₁₇ Number of international(external) publication collaboration by departmental faculty					

Part C: Performance measured by Balance scorecard

Please tick from 1 to 5 with 1= Highly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree;

5 = Highly Agree

Balance Scorecard Indicators	Items	1	2	3	4	5
Financial Measures	Operating budget of the department					
	Budget allocation growth					
	High patronize of fee paying programmes					
	Increase in IGF from postgraduate programmes					
	Net cash flows					
	Costs per student					
Customer measures	Market share of Undergraduate students					
	Students' response time to admission					
	On-time feedback on assessment					
	Number of student complaints					
	Survey of student satisfaction					
Internal Business	Materials efficiency variance					
	Student graduation lead time					

Processes	Rate of material scrap loss					
Measures	Labour efficiency variance					
Innovation and Learning Measures	Number of new patents					
	Number of new programmes launches					
	Time-to-market for new programmes					
	Teaching and non teaching staff satisfaction					

