Knowledge Management Towards Enhancing Academic Performance in Tertiary Institutions

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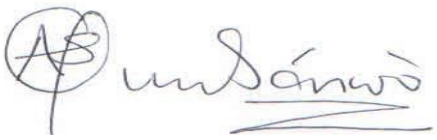
I declare that the above thesis is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.



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ABSTRACT

Tertiary institutions in developing countries have in their possession a huge stock of knowledge flow that calls for proper management especially in this era of knowledge economy. This study aimed at empirically examining the influence of knowledge management on academic performance in tertiary institutions in south-west Nigeria. The work paid particular attention to the awareness level of knowledge management (KM), factors responsible for effective knowledge management, metric for measuring knowledge management and its influence on academic performance. The study also sought to develop a model for successful knowledge management implementation in Nigerian tertiary institutions. The study adopted mixed methods and survey method by employing stratified random sampling to select 10 out of the 46 tertiary institutions in south-west Nigeria and purposive sampling to select 50 respondents from each institution. The closed-ended questionnaire for data collection was designed using the Likert scaling system but both the closed and open-ended questionnaires were administered on the total sample population of 500. While qualitative data was analysed with content analysis using Atlas.ti version 8 for data coding and analysis, and Microsoft Excel 2010 for data presentation. Both conventional analysis and structural equation model were used to analyses the hypotheses. SPSS version 21 over frequency count, percentage score, pie chart, Chi-Square test (X^2), exploratory factor analysis, Pearson correlation, linear regression analysis and multiple regression analysis and Analysis of Moment Structure software package version 26 over comparative fit index, root mean square error of approximation, Chi-square statistics, normed fit index, relative fit index, Tucker Lewis index, incremental fit index, and the goodness of fit index were adopted for quantitative data analysis. The result showed that the knowledge management awareness level in the institutions was high but still at a developing stage. It was also discovered that positive and linear significant relationship exists between knowledge management capabilities (process, enabler and strategy) and knowledge management success as well as academic performance, thereby suggesting that: (1) knowledge management capabilities have a positive influence on knowledge management success and academic performance thereby acting as a catalyst to them. (2) knowledge management success has a positive influence on the key indicators of academic performance.

Therefore, for knowledge management to move from a developing phase to a developed phase in Nigerian institutions, the education sector must adopt and integrate these knowledge management catalysts (process, enabler and strategy) into their operations to enhance academic performance.

Keywords:
Academic performance; awareness level; enabler capability; funding; knowledge management implementation; process capability; strategy capability.

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List of Publications

Listed below are the articles published from the research work in recognised academic journals.

Ogunbanwo, Okesola and Buckley (2019). Knowledge management awareness assessment in Nigerian tertiary institutions. *F1000Research, 8*(608), 1–10.

Ogunbanwo, Okesola and Buckley (2021). 'Knowledge Management Catalyst in Tertiary Institutions', *Journal of Theoretical and Applied Information Technology,* 99(6), E-ISSN 1817-3195 / ISSN 1992-8645.

Ogunbanwo, A. S., Okesola, J. O. and Buckley, S. (2021) 'Knowledge management capabilities - an empirical investigation', *IOP Conference Series: Earth and Environmental Science*, 655(012011). doi: 10.1088/1755-1315/655/1/012011.

Ogunbanwo, A. S., Okesola, J. O. and Buckley, S. (2021) 'Knowledge management conceptual framework in Nigeria tertiary institutions', *IOP Conference Series: Earth and Environmental Science*. 655(012010). doi: 10.1088/1755-1315/655/1/012010.

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List of Acronyms

ANOVA	Analysis of Variance
AP	Academic Performance
APKI	Academic Performance Key Indicator
BSD	Balanced Scorecard
CBN	Central Bank of Nigeria
CVR	Client Vendor Relationship
EC	Enabler Capability
GG	Grounded Graduate
GM	Global Mindset
ICT	Information Communication Technology
IK	Institution Knowledge
INN	Innovativeness
IRO	Increase Research Output
IS	Information Systems
IT	Information Technology
JP	Job Performance
KAC	Knowledge Acquisition
KC	Knowledge Conversion
KCP	Knowledge Capture
KCR	Knowledge Creation
KCS	Knowledge-Centre Support
KM	Knowledge Management
KMC	Knowledge Management Capability
KMP	Knowledge Management Practice
KMPe	Knowledge Management Performance
KMS	Knowledge Management System
KMSU	Knowledge Management Success
KRU	Knowledge Reuse
KSH	Knowledge Sharing
KST	Knowledge Storage

LE	Leadership
NIKMM	New Integrated Knowledge Management Model
NUC	National University Commission
OK	Organisation Knowledge
OP	Organisational Process
PC	Process Capability
PE	People
PI	Performance Increase
RQ	Research Question
SC	Strategy Capability
SLR	Systematic Literature Review
SPSS	Statistical Programme for Social Sciences
TI	Technology Infrastructure
TIN	Tertiary Institution
TTF	Task-Technology-Fit

CHAPTER ONE

Introduction and Project Overview

1.1. Introduction

The ranking system introduced into the educational sector has galvanised tertiary institutions into rapid progress and healthy efforts to outshine each other. Knowledge is described as a powerful resource and possessed in a huge volume by educational institutions (Ohiorenoya and Eboreime, 2014), knowledge flow calls for proper management to prevent it from being lost or wasted. Hence, Knowledge Management (KM) is an organisational tool for creating, disseminating, storing and reuse of knowledge to improve organisational performance (Ogunbanwo, Okesola and Buckley, 2019). Learning institutions in this knowledge-based economy era should therefore not only incorporate KM practice but also devise means to ensure its success.

Despite numerous advantages of KM, not many tertiary institutions have fully adopted it (Agarwal and Marouf, 2014). Some successes are being recorded in developed countries but many developing countries such as Nigeria are still far behind. Although several studies are ongoing on the impact of KM on organisational performance, less attention is paid to academic performance (Russli and Kassim, 2012). Hence, this study is motivated to investigate the KM awareness level and its impact on academic performance in Nigerian institutions.

1.2. Background to the study

Data is any unorganised fact while information is a set of data arranged and processed into meaningful patterns (Laal, 2011). Remarkably, knowledge is often confused with data and information because it can easily be understood through its relationship with them. Knowledge may therefore be expressed as the usable information put into productive use and given meaning; it is an asset, a capital, a powerful resource meant to improve organisational performance for competitive advantage (Salo, 2011).

Tertiary institutions (TIN) are communities made up of students, academic and non-academic staff members whose main activities are training and research. They engage in KM process (Hoq and Akter, 2012), that is, the production and consumption of knowledge. Knowledge plays a crucial role in the rating of tertiary institutions whose primary goal is to award certificates and carry out in-depth research. Tertiary institutions have the responsibility to generate knowledge required to drive any nation's economic development. It is a competitive tool that opens ways for students to acquire quality education and undergo effective academic experience while exposing academic

staff to knowledge sharing towards an increase in performance, innovativeness and research output. The sustainability of any institution obviously depends on the amount of knowledge it possesses just as its performance is a function of how knowledge is effectively created, shared and reused amongst the staff members.

Knowledge available to a tertiary institution is of two types - academic and organisational (Munir and Rohendi, 2012). Academic knowledge is the primary purpose of the institution while organisational knowledge is the overall business knowledge of the institution (Munir and Rohendi, 2012). With regard to the volume of organisational knowledge flow during administrative and academic processes, it is necessary for institutions of higher learning to put in place adequate KM towards retaining the knowledge flow for educational development (Nawaz and Gomes, 2014).

KM activity is an everyday process (Russli and Kassim, 2012) that can be effectively integrated to the institution's activities at all levels to achieve the institution's goals and objectives. Universities are required to invest in KM to enable them develop a knowledge capability that could aid the flow of information within their institutions (Fattahiyan, Hoveida, Siadat, and Talebi, 2013). Bhusry and Ranjan (2012) argument that the teaching and learning process may be facilitated through the use of KM approach is being complemented by a lot of other researchers including Al-sulami, Rashid and Ali (2014) who submit that effective and efficient knowledge implementation is much more needed for the intellectual growth of tertiary institutions. This implies that KM is also an essential weapon to sustain competitive advantage and enhance performance (Zaied, Hussein and Hassan, 2012). However in any tertiary institution, knowledge can only be measured through quality academic performance (Russli and Kassim, 2012) as it is a new management method that links knowledge and organisational performance (Inkinen, 2016). It therefore becomes necessary to observe and measure the influence of KM in achieving academic performance which is the main focus of this research.

1.3. Problem Statement

Knowledge is power; it is the main strength of development and a valuable asset (He and Abdous, 2013; Al-sulami, Rashid and Ali, 2014; Sharma and Kaur, 2016) from where every organisation's competitive advantages are derived (Gyaase, Anane and Armah, 2015). Its importance to any institution cannot be overemphasised since modern organisations must disseminate and share it to survive (Howell and Annansingh, 2013). However, knowledge has to be properly managed on a day-to-day basis to promote institutional competencies and performances (Conchado, Carot and Bas, 2015).

Effective KM improves organisational competitiveness through sharing of the best practices, resulting in better decision making, faster response to key institutional issues, and improved people's skills (Omona, Lubega and Weide, 2012). Knowledge can fade off easily if it is not managed properly (Asrar-ul-haq and Anwar, 2016), or get permanently lost due to a lot of factors such as retirement, death, and forgetfulness. Effective KM in the educational sector prevents intellectual assets from decaying by fostering the sharing of innovative practice, promoting knowledge flow and avoiding duplication. Notwithstanding all the merits, not many institutions have embraced KM (Agarwal and Marouf, 2014) due to their inadequate KM capabilities - process, strategy, enabler and KM system (Ojo, 2016).

Much work has been done on KM practice and organisational performance but only little studies are on KM practice and academic performance (Russli and Kassim, 2012). The extent to which the Nigerian universities have realised the importance of KM is also yet to be fully investigated (Ohiorenoya and Eboreime, 2014), thereby prompting this study's objectives and goals.

1.3.1. Research Questions

The following research questions are raised to address the study objectives highlighted in section below:

RQ1: What is the awareness level of KM?

RQ2: What are the factors responsible for the successful implementation of KM?

RQ3: How can impacts of KM be measured?

RQ4: Can KM influence academic performance?

RQ5: How can a KM success Model be developed?

1.3.2. Objective of the Study

The study is guided by the objectives listed below:

Objective 1: To ascertain the awareness level of KM.

Objective 2: To establish the factors that contribute to KM success/effectiveness.

Objective 3: To identify effective metrics to measure KM.

Objective 4: To ascertain the influence of KM on academic performance

Objective 5: To develop a model for KM implementation success.

1.4. Overview of the methodological approach

This research work adopts mixed method approach and both structured and unstructured questionnaires as the research instruments. Stratified random sampling is used to select ten (10)

tertiary institutions out of the 46 accredited institutions in south west Nigeria while purposive sampling technique is deployed to pick a total population of 500 participants with 50 from each tertiary institution. The qualitative and quantitative data are respectively analysed with the content analysis and descriptive inference statistical tools. Hence, frequency, percentage count, pie chart and histogram (descriptive statistical tools) are employed for demography and participants' responses analysis while the inference statistical tools employed include Chi square, Pearson correlations, linear regression and multiple regression analysis.

1.5. The research contributions

Researchers believe that KM is key to educational development with its implementation but not many institutions of higher learning in developing countries have embraced it. Even where accepted and practised, less attention is often paid to its effectiveness as very little literature is available on its (KM) success. This study investigates the state of KM in Nigerian tertiary institutions and proposes a conceptual model that should promote effective KM practice to allow a smooth flow of knowledge within the institution and ease learning process.

This study notes that related literatures reviewed did not recognise *"funding"* as a measurement factor. However, considering economic situations of developing countries like Nigeria as well as the argument of Ohiorenoya and Eboreime (2014), funding is here considered a strong factor in the success of any KM implementation. This study therefore proposes *funding* as one of the key components of strategy capability, and presents the following as the measuring scale to grade KM in Nigerian tertiary institution: process capability (knowledge capture, knowledge sharing, knowledge storing and knowledge reuse), enabler capability (organisational process, leadership, technology infrastructure and people) and strategy capability (planning, policy and funding).

1.6. Terminology used in the thesis

Academic community	It is a structure that nurtures and promotes creation, sharing and application of knowledge.
Academic performance	A measurement for achievement in an academic environment.
Asset	A valuable object owned by a person, an institution or a company.
Awareness	Having knowledge or information about something.
Best practices	Acceptable guidelines put in place to achieve certain goals efficiently and effectively.
Capability	The ability to do something.

Conceptual framework	An analytical tool which consists of many contexts and variations.
Conceptual model	A representation of a system that uses concepts and ideas to form said representation. A conceptual model is the model of an application that the designers want users to understand
Data	Data is a letter or number or word without context.
Dependent variable	Variable that relies on other elements that are measured.
Effectiveness	Attaining desired result successfully.
Enabler Capability	Knowledge management supporting tools.
Expert system	A computer system that imitates human ability of decision-making.
Explicit knowledge	Knowledge that is documented.
Grounded Graduate	Employable graduate.
Hidden knowledge	Secret Knowledge.
Independent variable	It is a stable variable that is not affected by other measuring variables.
Information	Information is data processed and organised in a meaningful pattern
Innovativeness	Ability to think and act independently.
Integration	The process of uniting or incorporating something into a larger unit.
Knowledge	Knowledge is information, skills and understanding that are got through learning or experience.
Knowledge Capture	Ability to gain or catch possession of knowledge
Knowledge Management	Process of organising, coordinating and making knowledge possessed by the institution available for creating, sharing, storing and reuse of knowledge to increase academic performance.
Knowledge management implementation	Process of putting a decision or plan into execution.
Knowledge management performance	A measurement of knowledge management practice effectiveness.
Knowledge management performance measurement	Refers to the variables or intermediaries used to measure knowledge management performance.
Knowledge management practice	Managerial and organisational way of doing things repeatedly with the intention of achieving organisational goals and objectives through efficient and effective management.

Knowledge management success	Accomplishment of knowledge management goals.
Knowledge Management System	Provides technological tools that aid process capability.
Knowledge reuse	Solving problem or applying knowledge using new knowledge acquired from the institution.
Knowledge sharing	Process of disseminating or transferring knowledge within the institution.
Knowledge storing	Process of organising and storing acquired knowledge.
Performance increase	Improvement in someone's ability and efficiency.
Performance Indicator	This is used to describe some useful variables for assessing and evaluating knowledge management capability.
Personal knowledge	This is knowledge gained by a person via observation or experience.
Process capability	It provides avenue for knowledge capturing, sharing, storing and reuse.
Strategy	The skill of making out a plan to achieve a goal.
Strategy Capability	Knowledge management supporting tool for achieving knowledge management success.
Tacit knowledge	Knowledge that resides in human brain

1.7. Thesis structure

This study consists of six chapters.

Chapter 1: Introduction and project overview: The chapter discusses the background to the study, research problem statement, research questions, hypotheses and research objectives as well as the contribution to knowledge. Terms and definitions are clarified and a briefing on the research design and methodology is given.

Chapter 2: Review of Literature: This section digs into the previous related research done to give assessment of existing KM capability, KM measuring scale and relevance of KM in tertiary institutions. It discusses the following as related to the past related works: Overview of KM, KM practices and viewpoints, KM in tertiary institutions, and KM performance measurement.

Chapter 3: Theoretical Model: This section discusses the theories guiding the study by elaborating on the conceptual and theoretical framework of the study. The chapter also elaborates on the proposed conceptual model for successful implementation of KM practice.

Chapter 4: Research Methodology: Research techniques and methodologies adopted are discussed and the rationale for choosing them is justified. For easy elaborations, various research methods are treated as subheadings and the validity and reliability of the research instrument is ascertained. The process flowchart and research framework are also presented.

Chapter 5: Data Analysis and Results: This chapter presents the respondents' biography and their responses to the questionnaire, and generated results to give details of analysis for both quantitative and qualitative data.

Chapter 6: Result Interpretation and Discussion: The results obtained are discussed and various findings are interpreted to answer research questions raised following a comprehensive literature review.

Chapter 7: Conclusions and contributions: The chapter gives a summary of the whole chapters and draws a conclusion based on findings attained to provide recommendations and suggestions for future research works.

1.8. Summary

This chapter introduced KM as a tool to manage organisation knowledge in tertiary institutions and gave some theoretical background to the study. It evaluated the impacts of KM on academic performance and formulated the study hypotheses to address the problem statement towards answering the research questions and achieving research objectives. The significance of the study and its contributions to the knowledge were highlighted as well. The research methodology and design adopted for this work were briefly discussed.

CHAPTER TWO

Review of literature

2.1. Introduction

Significant works have been done on KM and its usefulness for improving performance in the educational sector. This chapter reviews these related works as well as the application of KM in tertiary institutions towards enhancing academic performance. It is grouped into eight sections with every section discussing the existing knowledge gap on KM implementation in developing country. The first section discusses the overview and concept of knowledge, and the second section elaborates on knowledge management overview. KM practice and its application was discussed in the third section but KM system as a technological tool used to support KM activities were treated in Chapter four. KM is presented in the fifth section as a special tool for managing organisation and enhancing academic performance in tertiary institutions, but only its performance measurement was reviewed in the sixth section. The seventh section demonstrates the theoretical stand on the models adopted for the study while the last section (eight) gives the summary of this entire chapter.

2.2. Knowledge Overview

Data is any unorganised fact but information is data in context. Increase in data growth triggers data transformation to a useful information that is regarded as knowledge (Laal, 2011). Hameed and Badii (2012) define knowledge as information used to express certain meaning and Gyaase, Anane and Armah (2015) regard it as a way to action, decision and direction. Dhamdhere (2015) similarly sees it as an insight and wisdom of employee that could be used for decision making. However, "knowledge" is often confused with data or information because it is better understood through a relationship with either of them. Therefore, this study defines knowledge as a process of studying information through observation, experience and teaching to accomplish competitive edge over others. Knowledge in an organisation can be classified into two – tacit and explicit.

2.2.1. Tacit Knowledge

Tacit knowledge is the one located in the human brain, mind, behaviour, and perception (Sulisworo, 2012) making it personal to its carrier. It is rooted in the procedure, action, commitment, emotion and values (Sánchez, Sánchez, Collado-Ruiz, and Cebrián-Tarrasón, 2013) and consists of insight, perceptions, expertise views, intuitions, experience, craftsmanship and hunches (Laal, 2011; Dhamdhere, 2015). The manner in which an individual behaves and conducts their activities is also governed by tacit knowledge which such individual possesses (North and Kumta, 2014).

Tacit knowledge creates value for an organisation because it is the art of getting things done (Sulisworo, 2012; Sánchez *et al.*, 2013; North and Kumta, 2014; Dhamdhere, 2015). It may be gained through experience and beliefs of an individual that possesses it or through various activities such as conversations, workshops, on-the-job training and mechanisms such as e-mail, groupware and instant messages. However, the knowledge is difficult to measure and may vanish especially with the exit of employees from the organisations. Hence, It is essential for an organisation to identify its useful tacit knowledge and hold onto it through an effective KM practice (Goh and Sandhu, 2013).

2.2.2. Explicit Knowledge

Explicit knowledge is defined as a set of recorded and well documented information that helps in action taken (Dhamdhere, 2015). It is simple to capture, documented and share via manuals, documents and information technology (Sulisworo, 2012; Wong, Tan, Lee and Wong, 2015). It may be expressed in words and numbers but can only be gained via memo, reports, trademarks, business plans, curricula and methodologies.

Although the explicit and tacit knowledge have different features as stated above, the interaction between the two causes the personal knowledge to be converted into organisational knowledge (Sánchez *et al.*, 2013). To fully gain from the organisation's intellectual capital therefore, strategies must be built to transform tacit into explicit knowledge.

2.3. Knowledge Management Overview

KM is not a new terminology but an ancient phenomenon that has gained popularity among the academicians, researchers, and philosophers for decades and acquired varying definitions from many authors (Nawaz and Gomes, 2014; Gyaase, Anane and Armah, 2015). It is a formulation process to establish enabling environment for the staff of any organisation to create, share, learn and reuse knowledge towards achieving organisational goals (Chu, 2016).

While Nawaz and Gomes (2014:71) view KM as a well-defined system that provides learning process, innovation process and sharing of knowledge to achieve organisational strategic goals, Sharma and Kaur (2016) regard it as a process that retrieves, protects, uses and manages existing knowledge to achieve competitive advantage and successful decision making. However, Dhote and Dhote (2012) see KM as a mere collection of process that controls the creation, diffusion and application of knowledge, and therefore agrees with Hasani and Sheikhesmaeili (2016) that KM itself is just a process that permits organisations to formulate ways to identify and store knowledge assets acquired for the knowledge carrier working in the organisation.

Although there are no specific definitions for KM, there exists no much difference between the available ones (Yahyapour, Shamizanjani and Mosakhani, 2015). Putting these definitions together, this study defines KM as a process that organises, coordinates and makes knowledge possessed by an organisation available for creating, sharing, storing and reuse of knowledge to increase organisational performance.

2.4. Knowledge Management Practice (KMP)

Tertiary institutions unconsciously involve in KM as KM activities occur naturally in every organisation (Wee and Chua, 2013). Since knowledge is a most valuable asset to any organisation that desires growth and innovation, many authors have been researching on the impact, effectiveness and efficiency of knowledge management practice (KMP) on the organisational performance. According to Inkinen (2016:232), KMP is the "conscious organisational and managerial practices intended to achieve organisational goals through efficient and effective management of the firms knowledge resources". He also addressed the research gap on lack of understanding and consensus facing KM by empirically examining the relationship between organisational practices, KM-base managerial and firm performance to conclude that utilisation of KM practices is a significant driver to innovation.

According to Alsalim and Mohamed (2013), every organisation is concerned about KM effectiveness since knowledge is considered significant to organisational success. Hence, Alsalim and Mohamed (2013) investigated empirically the impact of KM (knowledge generation, storage dissemination and application) on organisational performance. Survey was adopted as a research method where 33 Heads of Department in Iraq Institution of Technical Learning participated in the research. The result revealed that KM processes and performance indicators had significant relationship, implying that KMP had significant impacts on organisational performance. However, this result could not be generalised as the number of participants was too low.

2.4.1. Synthesis of Previous Studies on KMP

Abdullah, Hashim and Ali (2015) proposed the most recognised KM capabilities when they investigated the capabilities of KM based on Gold's approach. They viewed KM capabilities from two perspectives – knowledge process and knowledge infrastructure – and adopted quantitative approach using secondary data to discover that KM actually has a propensity for mediator. Riding on this study, Alaarj, Abidin-mohamed, Salwa and Ahmad (2016) introduced another mediator tagged "trust" as a variable to enhance organisation performance. They used survey method and Analysis of Moment Structure (AMOS) software to investigate the influence of the two major

components of KM capabilities (processes capability and technology infrastructure) on organisation performance. The result showed that infrastructure capabilities had lesser influence on an organisation's performance unlike Trust and the process capability. However, this result could also not be generalised due to the small sample size of the study.

Meanwhile, the impact of KM resources (specifically KM enablers and KM processes) on organisational performance had earlier been evaluated by (Fattahiyan *et al.*, 2013) in a descriptive correlational research where regression analysis was adopted to test the research hypotheses. The results showed that it was not all KM resources that were directly related to organisational performance as technology (enabler) and knowledge conversion process did not exhibit any form of association.

Some researchers (Chang and Chuang, 2011; Oluikpe, 2012) claimed that strategy capability also has a positive impact on KMP thus, any organisation investing in KMP must develop a better strategy to support it. Adopting quantitative approach, Aktürka and Kurtb (2016) conducted an empirical investigation on the relationship between the two variables and found a significant relationship between the KMP and the strategy formulation capability, suggesting that a well formulated strategy promotes effective usage of KMP. However, they considered only one aspect of KMP (process capability) leaving aside the relationship of strategy capability with an organisation's performance.

The relationship between the KM process, business strategy and infrastructure capability as well as the influence of KM on the firm's performance has also been investigated. Chang and Chuang (2011), for instance, proposed the KM process as knowledge choice, knowledge access, knowledge storage, and knowledge sharing but represented infrastructure capabilities by knowledge-based culture, knowledge-based structure, knowledge-based technology and knowledge-based human resource. Regarding the business strategy as low cost strategy, differentiation strategy and focus strategy, the study adopted a case study of 135 firms for data collection. They concluded that there was a positive relationship between the business strategy, infrastructure capability and knowledge processes, and that knowledge processes have positive effect on an organisation's performance. Meanwhile, the study was also silent on the relationship between infrastructure capability and business strategy capability and its influence on an organisation's performance.

Mohammad, Mohammad, Ali and Ali (2014) investigated the influence of KM capabilities (process capability and infrastructure capability) on organisational performance in a Malaysian private university. They discovered that process capability (acquisition and application) has a positive

influence on organisational performance just as infrastructure capability (technology, culture and structure) has positive impact on organisational performance. However, the study was limited to only two elements from process capability and three elements from infrastructure capability, which were considered inadequate to generalise the results.

The literature reviewed so far points to the fact that KM may be assessed only from just three viewpoints – process capability (PC), enabler capability (EC) and strategy capability (SC). The constructs are discussed in the next sections.

2.4.2. Process Capability (PC)

Process capability (PC) is "the use of the most efficient method to transform the private knowledge of individuals or group into valuable intellectual assets" (Ho, Hsieh and Hung, 2014:736). Sangari, Hosnavi and Zahedi (2015) emphasised the importance of PC for its ability to turn personal knowledge to organisational knowledge which may be circulated for usage within the organisation. This implies that PC is a crucial variable (Abdullah, Hashim and Ali, 2015) as it facilitates an effective and efficient flow of knowledge in any organisation. As depicted in Table 1, many studies have identified varying processes and mechanisms for managing knowledge, yet there exists a miniature agreement on what constitutes the KM process itself (Wee and Chua, 2013).

Table 1: KM Process Capability Components (Own Compilation)

S/N	KM Process Elements	Researchers	Year
1	Knowledge capture, sharing, reuse and storing	Ogunbanwo, Okesola and Buckley	2021
2	Knowledge creation, organisation, storage, dissemination and usage.	Wendo, Rop and Mwanzu	2021
3	Knowledge creation, knowledge storage and retrieval, knowledge distribution and knowledge application	Mansour and Abuarqoub	2020
4	Knowledge creation, acquisition, storage, application and protection.	Kaldeen, Nawaz and Hassan	2020
5	Knowledge creation/capture, knowledge sharing/transfer, and knowledge application	Goddard	2020
6	Knowledge creation, storage, access and dissemination	Antunes and Pinheiro	2020
7	Knowledge creation, Knowledge sharing, Knowledge utilisation,	Abusweilem and Abualoush	2019
8	Knowledge acquisition, creation, capture, storage and retrieval, sharing and knowledge utilisation	Yami and Ajmal,	2019
9	Knowledge creation, capture, sharing and application	Turyahikayo	2019

10	Knowledge acquisition, knowledge sharing, knowledge creation and knowledge retention	Alias, Mansor, Rahman, Ahmad and Samsudin	2018
11	Knowledge generation, storage, sharing and application	Abualoush, Masa'deh, Bataineh, and Alrowwad	2018
12	Knowledge identification, acquisition, creation and dissemination	Ugwu	2018
13	Knowledge acquisition, sharing, development, preservation and application	Raudeliūnienė, Davidavičienė and Jakubavičius	2018
14	Creating knowledge, Capturing knowledge, Organising knowledge, Storing knowledge, Disseminating knowledge and Applying knowledge	Kumaravel and Vikkraman	2018
15	Acquisition, conversion, dissemination and application	Tongsamsi and Tongsamsi	2017
16	Acquisition, conversion, application and protection	Ha, Lo and Wang	2016
17	Application, identification, evaluation, sharing and storage	Ojo, A.	2016
18	Application, storage, acquisitions and sharing	Shih and Tsai	2016
19	Application, transfer, acquisition, sharing, creation and storage	Lyu, Zhou and Zhang	2016
20	Sharing, utilisation and acquisition	Alaarj *et al.*	2016
21	Application, creation, transfer and storage	Chang and Lin	2015
22	Generation, creation and acquisition, sharing and transferring , storing and codification, and utilisation and application	Lee and Wong	2015
23	Acquisition and processing, storage and accumulation, share and exchange, and application and innovation	Noonpakdee and Phothichai	2015
24	Creation, capture, organisation, storage, dissemination and application	Sangari, Hosnavi and Zahedi	2015
25	Acquisition, creation and generation, utilisation and application, storing and updating, Knowledge sharing and transferring and protection	Tan and Wong	2015
26	Sharing, creation and application)	Abdullah, Hashim and Ali	2015
27	Data gathering, data organisation, data storage, data analysis, and sharing of knowledge	Draganova and Doran	2014
28	Creation, accumulation, sharing, utilisation and internalisation	Ho, Hsieh and Hung	2014
29	Acquisition, conversion, application, and protection	Fattahiyan *et al.*	2013
30	Generation, storage, dissemination and application	Alsalim and Mohamed	2013

Villar, Alegre and Pla-Barber (2014) examined the role of PC on export intensity in Small-Medium-Enterprise (SMEs), but considered only two elements of process capability – knowledge

dissemination and knowledge storage. The study adopted a quantitative approach and discovered that PC promotes exports intensity and equipped the manager with the understanding needed to deal with dynamic capabilities in Small-Medium-Enterprise (SMEs).

Sangari, Hosnavi and Zahedi (2015) similarly built a theoretical framework that was made up of six PC elements to examine the relationship between PC and supply chain performance using the moderating factors such as information technology/system support, supply chain integration and supply chain strategy. Survey method was adopted to collect data from 78 Iranian manufacturers in mechanical and engineering industry. Analysing the data using a one-way ANOVA, they confirmed that PC actually has a positive and significant effect on supply chain performance.

Abusweilem and Abualoush (2019) investigated the relationship between KM process, business intelligence and organisational performance employing survey and multiple regression for data analysis. Considering only three KMP (knowledge generation, knowledge sharing, and knowledge utilisation), they found a positive relationship between KM process and organisation performance, as well as between business intelligence and organisational performance.

Various submissions from different researchers suggest that there are no specific components for process capability. Thus, Table 1 gives a summary of PC components as proposed by different researchers on which basis this study presents knowledge capture (KCP), knowledge sharing (KSH), knowledge storage (KST) and knowledge reuse (KRU) as the most generally accepted PC components.

2.4.2.1. Knowledge Capture (KCP)

Knowledge capturing is the identification and codification of tacit and explicit knowledge within the organisation and its environment (Mohapatra, Agrawal and Satpathy, 2016). Knowledge in an organisation is captured through knowledge acquisition (KAC) process and knowledge creation (KCR) process. It may also be acquired through seminars, and conferences, or even imported directly from external resources (Dhamdhere Namdev, 2015; Sharma, Chadee and Roxas, 2016; Mohajan, 2017). However, KAC is a medium where tacit knowledge is gained by staff in order to carry out their duties successfully (Tan and Wong, 2015). During KAC, new ideas, concepts, innovation and solving-solution are derived to help the staff of the institution in their daily operation towards enhancing their job performance.

KCR is a continuous process that gives birth to new concepts, ideas and innovations. Sulisworo (2012) tagged the creation of new knowledge to expertise, motive, experience, intuition and insight that arise in an individual while Chang and Lin (2015) recognised it as a process of new content

development or existing content replacement within the organisation. The focal key to KCR is learning process during which the knowledge is created by the organisation staff (Tan and Wong, 2015).

2.4.2.2. Knowledge Storage (KST)

Knowledge storage is an act of storing existing organisational knowledge (in a user friendly database) for easy accessibility (Bharadwaj, Chauhan and Raman, 2015). It is necessary to organise and store knowledge acquired, gathered and created in the form of database to permit easy access for reuse at any time (Dhamdhere, 2015)**.** Since knowledge is not static (Lee and Wong, 2015) and obsolete knowledge is very dangerous to any organisation, knowledge needs to be constantly updated to keep it current and relevant. Knowledge resides in the mind of people and may be retained in the organisation when tacit knowledge is codified into explicit form and stored in knowledge repository for future use by other members of the organisation. Hence, Dhamdhere Namdev (2015) suggested the use of technology indexing skills as a requirement for successful KST.

2.4.2.3. Knowledge Sharing (KSH)

Knowledge Sharing (KSH) is a building block for organisation survival (Witherspoon, Bergner, Cockrell, and Stone, 2013), and is generally referred to as knowledge disseminate or knowledge transfer. Knowledge can easily be shared through memos, instruction, group discussion, internal meeting, seminars, workshops, and conferences (Tan and Wong, 2015). Hence, KSH is an act of making knowledge available to others through knowledge exchange (Muhammad, Rahman, Abd Rahman, Idris, Sabri, and Jusoff, 2011), and regarded as the most important out of the PC components (Asrar-ul-haq and Anwar, 2016).

KSH cannot be enforced on the staff; it is at the individual's discretion (Tangaraja, Mohd Rasdi, Ismail, and Abu Samah, 2015) that is often guided by the old paradigm of 'Knowledge is power' which makes most people somehow reluctant to KSH for the fear of losing their relevance, importance or position (Kumari and Takahashi, 2014). According to Howell and Annansingh (2013), organisations will not have control over past experience and expertise if knowledge is not shared. Organisations are therefore required to provide an effective mechanism for encouraging and motivating their workers towards KSH (Lin and Lo, 2015) as the knowledge can disappear or vanish at the exit of the worker in the organisation. KSH plays an important role by efficiently reducing knowledge redundancy. The more an institution shares knowledge among its components, the more its knowledge gets enriched and refined, and the more she gains competitive advantage over her

counterpart institutions. However, Becerra-Fernandez and Sabherwal, (2010) warned that KSH should be with caution to avoid knowledge leakages to the competitors.

2.4.2.4. Knowledge Reuse (KRU)

KRU is a process of making use of the existing knowledge entrenched in an organisation (Allameh, Zare and Davoodi, 2011). Knowledge is only valuable and relevant when it is reused and applied properly (Fattahiyan *et al.*, 2013; Lee and Wong, 2015). Hence, KRU avails employees the required knowledge for informed decision making, action and problem-solving towards enhancing organisational performance on daily routine. However, as much as KRU promotes efficiency, it may as well lead to reduction in KCR (Becerra-Fernandez and Sabherwal, 2010).

2.4.3. Enabler Capability (EC)

Knowledge enablers are referred to as knowledge infrastructure (Chang and Chuang, 2011) or KM pillar (Dhamdhere, 2015). They are a set of factors put in place to make a way for a successful KM implementation. This study referred to it as Enabler Capability (EC) and it has attracted much attention from researchers regarding the theoretical and empirical studies on its components.

Different researchers are coming up with different suggestions on components of KM enabler. Anvari, Alipourian, Moghimi, Baktash and Mojahed (2011) identified culture, skills, information and technology as the elements of EC whereas Assegaff, Hussin and Dahlan (2013) considered only managing people, knowledge/information and technology as the three important components. Ganesh, Mohapatra and Nagarajan (2014) have a mix of the components and presented leadership, organisation, process and technology; but structures, cultures and information technology support were proposed by Shih and Tsai (2016) as components of knowledge enabler. Table 2 depicts elements of KM enabler as proposed by some authors.

Table 2: KM Enabler Capability Components (Own Compilation)

S/N	Enabler Capability Components	Researcher	Year
1	Leadership, people, organisation process, technology infrastructure and strategy	Ogunbanwo, Okesola and Buckley	2021
2	Organisation structure, strategy, technology, culture, leadership, and trust	Rezaei, Khalilzadeh and Soleimani	2021
3	Organisational culture and management style	Goddard	2020
4	Human resources and organisation structure	Antunes and Pinheiro	2020
5	People, processes, technology and content	Mansour and Abuarqoub	2020
6	Technology, leadership, culture and environment	Paudel	2019
7	Technological, structural, and cultural)	Masa'deh *et al.*	2019
8	Individual, organisational, management support and technological factors	Salami and Suhaimi	2019

9	Technology, organisational structure, collaboration and Trust	Kumaravel and Vikkraman	2018
10	Leading organisation, leading people, leading self	Alias *et al.*	2018
11	people, processes, technology, culture and structure	Abuaddous and Sokkar	2018
12	Organisational Culture (OC), IT Infrastructure (IT), and Organisational Structure (OS).	Abualoush *et al.*	2018
13	Management support, human resource development, reward system collaboration	Ugwu	2018
14	People, processes and technologies	Chu, K. W.	2016
15	People, processes, leadership and Outcomes	Naser, Al Shobaki and Amuna	2016
16	Organisational Culture, Organisational Structure, Human Resource and Technological Support	Sharma and Kaur	2016
17	IT support, organisation structures and cultures	Shih and Tsai	2016
18	Technology infrastructure, organisational culture, and organisational structures	Alaarj *et al.*	2016
19	Culture, management leadership and support, organisational infrastructure, strategy, resource, and human resource management	Lee and Wong	2015
20	Culture, management leadership and support, organisational infrastructure and technology, and strategy	Tan and Wong	2015
21	Systematic processes, culture, strategy, IT infrastructure and rewards.	Attallah, Athab and Abed	2015
22	Organisation structure, Infrastructure and organisation culture	Bharadwaj, Chauhan and Raman	2015
23	Information technology, staff, organisational culture and structure	Majin, Eslampanah and Jamshidinavid	2015
24	Organisational structure, corporate culture, information technology, people and strategies	Makambe and Pellissier	2015
25	Culture, technology, and structure	Abdullah, Hashim and Ali	2015
26	Leadership, organisation, process and technology	Ganesh, Mohapatra and Nagarajan	2014
27	Organisational culture and structure	Ho, Hsieh and Hung	2014
28	Technology, organisational culture and organisational structure	Fattahiyan *et al.*	2013
29	Human resources, organisation culture and technology utilisation	Ainissyifa	2012
30	Knowledge-based culture, structure, technology and human resource	Chang and Chuang	2011

2.4.3.1. Leadership (LE)

There is always a change in the concept of leadership due to advance in globalisation, technology and work practices (Alonderiene and Majauskaite, 2016). Leadership is regarded as a powerful enabler of knowledge sharing (Asrar-ul-haq and Anwar, 2016) as without commitment of the organisation management team the KM initiative may fail. Munir and Rohendi (2012) argued that staff participation in knowledge sharing and incentives given to the knowledge carriers in academic community may lead to a successful KM implementation and enriched knowledge process culture in an institution. Thus, Alonderiene and Majauskaite (2016) empirically examined the impact of leadership style on job satisfaction to confirm that leadership has a global effect on job satisfaction and by extension, a resultant effect on the staff and organisation performance. Sayyadi (2019) also confirmed that transformation leadership has positive influence on knowledge management which serves as a driver to improve organisational performance.

2.4.3.2. People (PE)

Human capital represents the collective value of workers' competency in an organisation (Tan and Wong, 2015) and creates new ideas and concepts using its staff skills, expertise and abilities (Sánchez *et al.*, 2013). Knowledge ordinarily resides in the mind of the workforce, and organisation that values its human capital will make more profits and increase its market value (Tan and Wong, 2015). Hence, effective mechanism must be put in place to encourage workers to participate in knowledge process and promote interactions among the people in an organisation (Lin and Lo, 2015). Gyaase, Anane and Armah (2015) identified people as the source of knowledge, and very crucial to organisation and institutions' survival. "Employees who have received knowledge from other members within the organisation should be obliged to reciprocate the action by contributing knowledge to others within the organisation" (Tangaraja *et al.*, 2015:125). Hence, KM implementation in tertiary institutions must first consider people by whom knowledge is generated before the process and material resources.

2.4.3.3. Technology Infrastructure (TI)

This is a body of thought that emphasises how information is being managed. Technology infrastructure (TI) is a "diverse set of technological tools and resources used for creating, storing, managing and communicating information" (Gyaase, Anane and Armah, 2015:1). TI is an important enabler because of its key role in supporting KMP (Al-sulami, Rashid and Ali, 2014). It permits novices or juniors to frequently apply methods used by an expert in a similar situation using special tools such as data warehousing and data mining (Draganova and Doran, 2014). It provides digital repositories for sharing knowledge which serves as a great KM driving force (Mohajan,

2017). Sulisworo (2012) examined the contribution of ICT in facilitating KM to increase institutional effectiveness. She discovered that availability of best practice and shared knowledge base through ICT tools gives a brighter future for an organisation. Pérez-López and Alegre (2012) similarly analysed the impact of IT competency on KM and postulated that technology is a key success factor to KM implementation. Kaldeen, Nawaz and Hassan (2020) investigated the impact of information technology infrastructure on organisation performance to conclude that technology makes knowledge creation and sharing within organisation easier as the use of IT resources on KM promotes organisation performance.

2.4.3.4. Organisational Process (OP)

Ganesh, Mohapatra and Nagarajan (2014) regarded organisational processes as a driving force that straps up knowledge within an organisation in a standardised way. This is a process set up to provide information and aid sharing knowledge to workers at the time of need. It is an operational aspect of knowledge resources which consist of roles, culture, processes, organisational structures, control measures, process improvement and business process reengineering (Ainissyifa, 2012). The success of KM rests on processes that motivate learning, boost skill and improve knowledge application to achieve positive results (Laal, 2011). Kamaruzzaman, Zawawi, Shafie, and Noor (2016:74) stated that "Organisations need to recognise and facilitate the flow of information for effective knowledge sharing and experiences through a process of redesigning their structure around the principles of flexibility, increasing the use of multi-disciplinary project groups to deliver the corporate agenda and redefining the management role into one of the trainers or coaches". The ability of organisational process to facilitate circulation of knowledge makes it an important component of enabler capability.

2.4.4. Strategy Capability (SC)

KM strategy is a policy, guideline or benchmark put in place for an improved KM (Dalkir, 2011). Its impact on KM has attracted attention of a lot of researchers including Oluikpe (2012) who investigated the development of KM strategy in Central Bank of Nigeria (CBN) and its influence on the business process of the bank. The study adopted case study research and used secondary data, it was discovered that strategy is crucial to KM success as it increases knowledge flow among the workers.

Al-Hakim and Hassan (2013) noted that despite the emphasis on importance of KM, organisations still lack the understanding and appropriate method for KM strategy. Hence, they examined the relationship between the KM strategies, innovation and organisational performance to propose a

theoretical framework. Survey was used for data collection from 220 managers in Iraqi mobile telecommunication sector and the theoretical framework was tested with structural equation model. They concluded that, KM strategies have positive and significant influence on innovation and organisational performance.

To form a position on whether KM strategies are essential to KM implementation, (Kim, Lee, Chun, and Benbasat (2014) proposed a contingency model that measured the impact of KM strategies (external codification, internal codification, external personalization, and internal personalization) on KM performance. The multiple-contingency model of KM strategies was developed based on the organisation, environment and technology framework, and the results suggest that only three out of four examined KM strategies – external codification internal codification, external personalisation - are significantly related to KM performance.

In a related work, Ojo (2016) noted that there is paucity of literature on KM strategy application in Nigerian Tertiary institutions and therefore proposed a conceptual model for KM implementation in Nigerian universities. He used the literature survey method to examine the concept of KM and its applications. Although this model is yet to be validated, the result reflects the importance of KM strategies in achieving KM success. A highly effective and efficient KM strategy is therefore required for any tertiary institutions of learning to remain competitive and innovative in this era of knowledge-based economy.

2.4.5. Relationship between KM Capabilities (process, enabler and strategy)

Al-sulami, Rashid and Ali (2014) employed quantitative and qualitative techniques to examine the impacts of IT on the implementation of KM process at a Malaysian private university. They realised that IT infrastructure offers a significant role and its inadequacies could impede KM processes implementation. Gyaase, Anane and Armah (2015) similarly employed descriptive data analysis to examine the level of ICT application in KM processes. The KM process was adjudged ineffective due to lack of strategic policies and low level of ICT utilisation.

Some researchers have investigated other factors such as leadership, organisational process, people, and culture. Wee and Chua (2013) viewed PC in Small and Medium-sized Enterprises (SMEs) from three viewpoints – knowledge creation (KCR), knowledge sharing (KSH) and knowledge reuse (KRU). A case study approach was adopted where 21 respondents from four Singaporean SMEs participated to examine the peculiarities of these process elements and identified their enablers. They discovered that the SME owners are the creators and sources of knowledge and leadership

was discovered to be a powerful enabler as full responsibility rest on SME owners being the sole drivers of PC. Similarly, Chang and Lin (2015) examined the relationship between enabler capability and process capability towards enhancing KM performance. They employed survey method and discovered that enabler capability had a positive impact on the employee's intention and processes capability by boosting the workers will to remain with the organisation. But the study emphasised on only one enabler factor which is organisation culture.

In their own study, Aziz, Lotfi and Dahlan (2015) adopted survey on 17 respondents to examine how KCR and KSH are being applied in Malaysian public and private universities. The findings showed that individual culture and top management support are essential and influential to knowledge sharing behaviour in tertiary institutions. Effect of knowledge self-efficacy and top management support on knowledge sharing, as well as the impact of knowledge sharing on firm innovation capability were also investigated by Hussein, Singh, Farouk and Sohal (2016). Using knowledge donation and collection as variables over a quantitative approach, they discovered that top management and knowledge self-efficacy have positive effect on knowledge sharing and only knowledge collection had positive impact on firm innovation capability.

Sharma, Chadee and Roxas (2016) presented a similar argument that KM on its own has a limited effect on client-vendor relationship (CVR) even though proper involvement of top management allows global firms to develop and maintain excellent CVR. They adopted Survey and the partial least squares approach to structural equation modelling and test the hypotheses. They concluded that KM and Global Mindset (GM) have positive and significant impact on the quality of CVRs, while the GM of leadership has substantive positive effects on the relationship between KM and CVR quality.

In an attempt to analyse the impact of organisational culture, technology and human resources on implementation of KM, Ainissyifa (2012) adopted quantitative model analysis base (path analysis approach) and selected 86 participants using stratified random sampling techniques. He discovered that human resources, organisational culture and technology utilisation have positive and significant effect on the implementation of KM in the formal education institutes. This is in line with Chang and Lin (2015) where organisational culture has positive impact on the employee's intention. Hence, organisation culture helps to retain staff and contributes greatly to KM process by boosting the staff will and job satisfaction.

2.4.6. Identified Gaps in Literature

An integrative KM model has been designed in the context of several studies in developing countries such as Jordan (Aldeen, Ahmad and Samadi, 2017), India (Bharadwaj, Chauhan and Raman, 2015), Malaysia (Mohammad *et al.*, 2014) and Taiwan (Chiu and Chen, 2016). The studies examined the relationship among the process capability, enabler capability and organisational performance. However, the models were designed purposely for Asian organisations which might not fit into the Nigerian system due to political and economic instability in the latter country. Also the aforementioned models excluded strategy capability, which is a crucial factor for KM effectiveness (Kim *et al.* 2014; Mohajan 2017).

It was also discovered that there is a contradiction in the findings of Fattahiyan *et al.* (2013), Sulisworo (2012) and Masa'deh, Almajali and Alrowwad (2019). Fattahiyan *et al.* (2013) discovered in their research that technology infrastructure as enabler capability is not significant to organisational performance while Sulisworo (2012) and Masa'deh, Almajali and Alrowwad (2019) discovered that it is significant to organisational performance. Thus, these findings might be differed due to geographical location, economic and political situation. Based on this conflict the findings cannot be generally accepted.

It was discovered from the reviewed literature that funding was not recorded as part of the components that facilitate KM practice effectiveness but due to the instability of economic and political situation in Nigeria, this study proposed **FUNDING** as part of strategy capability component.

2.5. Knowledge Management System (KMS):

KMS is a technological tool used by organisations to support and sustain KM activities. It is mainly for knowledge capturing, sharing, storing and feedbacks. Assegaff, Hussin and Dahlan (2013) regard KMS as an IT that allows organisations to manage knowledge effectively and efficiently while Anupan, Nilsook and Wannapiroon (2015) see it as a system used to support knowledge creation and dissemination within the organisation. It is a computerized system of KM that links data, information and knowledge together (Munir and Rohendi, 2012).

Ramakrishnan and Yasin (2012) state that KMS is better used as a strategy for decision making to increase the efficiency, effectiveness, and quality of university graduates. They claim the performance of the institution could be improved via a properly developed KMS in such a tertiary institution, which will improve the institution's performance, productivity and knowledge sharing.

Meanwhile, bearing in mind that KMS is used to organise and document knowledge in tertiary institutions. Anupan, Nilsook and Wannapiroon (2015:146) highlight five KMS supporting tools as internet, information retrieval programs, database management systems, knowledge based or expert system, and groupware.

Munir and Rohendi (2012) developed an online KMS prototype for tertiary institutions using SharePoint to gather, store and publish the institutions' available data. They however admit that the success of KMS could not be based on technological factor and therefore requested for further studies on other factors such as people, process and leadership policy. Similarly, Assegaff, Hussin and Dahlan (2013) recognised KMS as essential factor in KM initiative because of its ability to eradicate time barriers and distance and proposed a framework on how it could be implemented as a strong KM enabler in virtual communities. They argue that knowledge is created when people interact with each other and develop platforms such as Communities of Interest, Share Learning, Peer Assist and Communities of Practices where interaction can take place to leverage and create new knowledge.

Anupan, Nilsook and Wannapiroon (2015) developed a model for KMS in a cloud computing environment and used knowledge engineering approach to analyse and synthesise the applicable previous literatures towards developing the KMS framework. Using content analysis for data analyse, the study confirmed that their model consists important elements that can be used to improve and promote knowledge and cooperative learning activities. He and Abdous (2013) also proposed and implemented a knowledge-centre support (KCS) model for faculty support and service innovation based on their personal and practical experiences. Although, the framework may lack generalization since it was developed based on the authors' organisational environment, KCS and service innovation were adjudged very important to organisational supports.

Desta, Garfield and Meshesha (2014) proposed KMS architecture of three layers – presentation layer, process layer and data store layer – to banking industry. Laoufi, Mouhim, Megder, Cherkaoui and Mammass (2011) also proposed the model to higher institutions but of five layers – exploration, capitalisation, management, retrieval and knowledge base. Peng, Jiang and Zhang (2013) equally proposed a four-layer KMS framework to support web-based learning platform comprising of presentation service, web-based learning platform, KM service and infrastructure services. Same with Pinto (2014) who proposed a framework that established a relationship between KM practice, process and the technological tools. The framework was also organised into three main layers – technological infrastructure, knowledge system and KMP. Noonpakdee and Phothichai's (2015)

proposal was for a social enterprise in Thailand and it consists of four key features – KM module/content management system, community of practice system, learning management system and analytics and virtualization.

The main purpose of KM is to ensure that knowledge is effectively applied to the benefit of an organisation (Sangari, Hosnavi and Zahedi, 2015). This is easily achievable if systems are available to handle the proposed four KM processes discussed in section 2.4.2. There may therefore be a need for KM supporting system (Ramakrishnan and Yasin, 2012) to enhance institution productivity and performance. A robust KMS must capture all information as each component of the institution contributes to the system.

2.6. KM in Tertiary Institutions (TIN):

Tertiary institutions are knowledge-intensive in nature and regarded as knowledge-based organisations due to their role in knowledge development and management (Goh and Sandhu, 2013; Al-sulami, Rashid and Ali, 2014). Like other sectors, educational sector is being affected by the rapid change in educational market causing the tertiary institutions to think the same way as business organisations (Zwain, Teong and Othman, 2012). All institutions of learning generally share same beliefs in knowledge storing, accessing and sharing (Laal, 2011). This is because effective KM is of vital importance to increasing the quality and efficiency of education and research; to retaining the best professors and researchers; to developing new curricula; to improving cost efficiency; and to exceeding the limits of time and space allowed for the fulfilment of students' expectations anywhere, any time (Dhamdhere, 2015).

As noted earlier, tertiary institutions are made up of students, academic and non-academic staff and are characterised by research and training activities. All these components are directly or indirectly involved in knowledge activities (knowledge creation, sharing, etc.) to which their success is tagged (Russli and Kassim, 2012). Almudallal, Muktar and Bakri (2016) regarded activities in tertiary institutions as process role which they grouped into three categories – input, process and output (figure 1). The input consists of the staff (academic and non-academics), student, infrastructure and finance and the process consists of the teaching, collegiality and peer pressure. Output includes research and technology transfer, employable graduate and a wider society role.

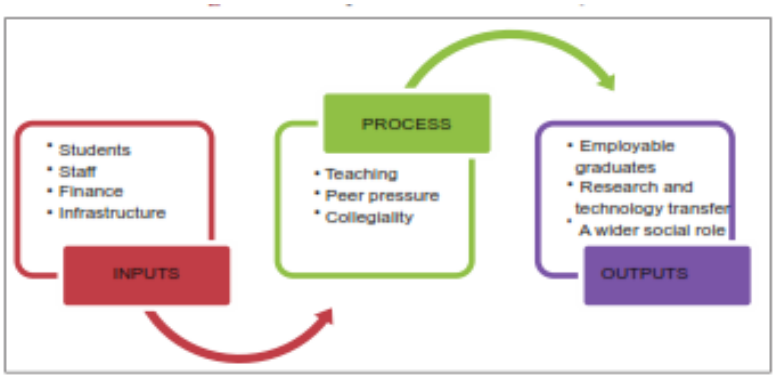

Figure 1: Process Role in Tertiary Institution (Almudallal, Muktar and Bakri, 2016)

Globalisation of businesses (driven by IT), and the advent of a knowledge-based economy are both important factors that empower graduates of institutions to respond positively to the changing demands of the market place. Meeting these contemporary needs of industry requires a thorough understanding of the courses that are taught in the universities because staff performance in the industry should be related to their academic performance while in school. Courses being taught are actually a measure of quality of knowledge and skills that shall be available for use in the industry upon graduation. KM therefore inspires tertiary institutions to meet up with the challenges of the knowledge era (Zwain, Teong and Othman, 2012) as it is positioned at an emerging phase to make every country participate actively (Dhamdhere, 2015). There is an increase in daily growth of KMP in developing higher institutions due to the development of information technology (Paudel, 2019). Raudeliuniene, Tvaronaviciene and Blažyt˙ (2020) also evaluated the application of KM practice and discovered a high potential of sustainable development in tertiary institution.

Lashkary, Matin, Kashani and Kasraei (2012) inspected the readiness of basic enablers such as culture and human factors, structure and processes, and technical infrastructure to implement KMS in Payame Noor University of Mashhad. Although, the ranking test presented culture and human factor as the most important element with IT and 'structure and processes' as the least, the authors believe strongly that the institution under investigation was not yet ready for KM. Similarly, Eftekharzade and Mohammadi (2011) evaluated the status of KM in Ismaic Azad University by examining the human resources, IT, organisation culture and organisation structure in other to promote KM. Descriptive survey methodology was adopted and both descriptive and inferential statistics were used for data analyses. The results show that KM implementation is inadequate in Ismaic Azad University as only human resources was discovered to be in appropriate level out of all other components of enabler capability.

For greater success in KM, Kalkan (2017) believes that KM should be viewed differently in tertiary institution. He therefore used secondary data to propose a theoretical framework that identified cooperation, tacit knowledge, knowledge continuity management, dominating power relationships, and social KM as the predatory factors for university KM implementation success. However, these proposed components were not subjected to empirical test.

2.6.1. Importance of KM in Tertiary Institutions

According to Al-sulami, Rashid and Ali (2014), KM best practices should be adopted by learning institutions to safeguard their knowledge assets from getting lost. Since the exit of the experts may leave a vacuum, there is a need to acknowledge and identify what specific knowledge is lost or may be lost (Joe, Yoong and Patel, 2013), and put in place processes to capture them before the exit of the recipients. According to Paudel (2019) application of KM practice is very relevant and useful to educational institutions. Nawaz and Gomes (2014) highlighted the following benefits as reasons why knowledge lost should be avoided by every tertiary institution:

- Improving services to the students, staff, faculty members, alumni and internal and external constituents.
- Minimising turnaround time for the research activities and reducing administrative cost.
- Encouraging the institute into interdisciplinary research activities.
- Enhancing competitiveness and responsiveness for research scholar, research proposals, funds, collaborations and new.
- Concentrating on quality of research at institutional level which will cultivate future scientists.
- Enhancing the quality in updating and revising the curriculum.
- Developing the capabilities of human capital, customer capital (students), organisational capital, innovation capital and intellectual property and financial capital.

Tertiary institutions ordinarily possess some hidden knowledge which are not easily accessible to the academic community due to inadequate knowledge capturing and storage. Hence, Dhamdhere (2015) advised that KM should make available the techniques for capturing hidden knowledge from the experts and transform them to coded form for later reuse. Based on the education framework, Salo (2011) analysed the concept of KM and explored strategies for its support in education by proposing KM process for educational institution in Indonesia.

Going by the amount of knowledge created during administrative and academic processes, employing KM will be more beneficial to institutions. An effective KM will guide the institutions

to discover the importance and impact of knowledge towards teaching and learning enhancement, as well as improving information usage and sharing for decision making.

2.6.2. KM in Academic Performance (AP) Enhancement

A number of studies have been carried out to explore the effect of KM on institutional performance since the application of KM in higher education improves institutions' capability in decision making as well as academic and administrative services (Salo, 2011; Nawaz and Gomes, 2014; Dhamdhere, 2015). Many of these studies (Hameed and Badii, 2012; Ramakrishnan and Yasin, 2012; Tan and Wong, 2015) have confirmed that the quality of academic learning process is enhanced when KM principles are applied. However, the success of KM has its root in the institution capability to develop systems, processes and conducive environment that promote learning, knowledge creation, sharing and reuse of both the organisation and personal knowledge (Pancholi and Pancholi, 2014).

Introducing IT to educational system gives way to new development in educational processes and alters traditional ways of researching, teaching and learning. Ololube, Agbor, Major, Agabi and Wali (2016) surveyed the impact of ICT on KM and its integration in higher education institution in Nigeria. They realised that IT enhances KM in tertiary institutions and associated the challenges facing implementation of KM to lack of infrastructures, critical IT policies, personnel and inadequate funding. Krubu and Krub (2011) is also of the same school that academic vision should be driven by KM. It is therefore expected of tertiary institutions, being the citadel of knowledge to embrace KM in order to avoid both their intellectual capital and scientific product dropping on a massive scale (Lashkary *et al.*, 2012).

Muhammad et al. (2011) adopted survey at Universiti Teknologi Mara (UITM) Terengganu to confirm that KM has a positive significance on academic performance. Zwain, Teong and Othman (2012) similarly investigated relationship between the KM processes and academic performance in Iraqi tertiary institutions by adopting survey and cross-sectional method and testing the hypothesis using correlation and regression analysis. The result showed that all KM processes have significant correlations with academic performance as the regression analysis indicated a positive and significant relationship between the KM processes and academic performance.

Ohiorenoya and Eboreime (2014) also adopted survey to determine the difference in KM effectiveness in Nigerian tertiary institutions and to investigate the relationship between KM and institutional performance. A total number of 389 respondents across the six selected universities participated and data collected were analysed using correlations, regression analysis and Analysis of Variance (ANOVA). It was observed that organisational performance differs due to disparities

in KMP. Even though, this result may not be generalised as only six out of over 70 universities in Nigeria were selected, it suggests that KM influences institutional performance in innovation, growth and competitiveness.

Organisation performance can be enhanced through knowledge capture and acquisition mechanisms but these mechanisms are not yet known in higher education institutions. Notwithstanding, Aming'a (2015) investigated knowledge capture and acquisition mechanisms at Kisii University to propose new mechanisms for the university. He adopted case study method and employed both interview and questionnaire as the research instruments with SPSS for data analysis. He realised that there were various knowledge captured and acquisition mechanisms but with several challenges. To address these challenges, the author proposed additional new mechanism – subject matter experts, after action reviews, and expert systems, and claimed that the combination of both the new and old mechanism will enhance and fortify the University operational knowledge base and organisation performance.

Shih and Tsai (2016) viewed KM capabilities as enabler capability and process capability, and investigated their influence on institution performance. Adopting survey and testing research data with structural equation modelling, the study showed that enabler capability predicted process capability, and that process capability predicted the efficiency and effectiveness of the institution. Meanwhile, Masa'deh, Shannak, Maqableh, and Tarhini (2017) stated that the varying success levels of universities is partially ascribed to how the university manage its knowledge flow. Their study investigated the relationship among the KM process, KM performance, and Job Performance (JP) in a university using structural equation modelling technique to fully analyse the data in order to determine what level of relationship existed among the variables. The authors predicted an increase in job performance once the institution keeps on sharing professional knowledge and experience among its members.

2.6.3. KM Model for Tertiary Institutions

According to Sulisworo (2012), putting in place appropriate KM framework is essential for proper management of institutional resources and KM system technology is required to bridge the gap between the present and prior contexts of knowledge process (Ramakrishnan and Yasin, 2012:70). Hence, Sánchez *et al*. (2013) proposed a framework that integrated knowledge creation and knowledge sharing processes towards promoting corporate culture in an organisation. Although their submission is still subject to validation as only two out of several KM processes were

considered in the study, the proposed framework can promote team work by creating interaction within the team and building highly productive environment to enhance organisational efficiency.

Draganova and Doran (2014) declared that in developing an enhanced system in a tertiary institution, there must be a link between learning and operational processes with KM technologies. Hence, they proposed a model to incorporate KM technologies into tertiary education processes towards improving knowledge transfer. Their model connects the KM processes, leadership, KM technology and institutional learning through the process reengineering concept and task-technology-fit (TTF) theory.

Ho, Hsieh and Hung (2014) proposed a model that integrated knowledge enablers (section 2.2.3), knowledge circulation process and job performance using questionnaire and structural equation modelling for validation. They concluded that formalised organisational structure (and not autonomous structure) has positive influence on KCP which in turn has a positive impact on task outcomes and contextual job performance. Nunes, Kanwal and Arif (2017) examined different research on KM in HEIs of South Asian countries using systematic literature review (SLR) on selected literatures from the major academic databases. The study produced some enabling factors that influence KM implementation, and grouped them into individual, organisational and technological factors. Although it is a conceptual model and yet to be validated, the findings suggested that very limited studies are being conducted in the area of KM implementation.

2.7. Knowledge Management Performance (KMPe) Measurement:

Wong *et al.* (2015) defined KMPe measure as the variables or intermediaries used to measure its performance. Measuring and evaluating the outcome of KM nourishes and guarantees organisational sustainability and success over time but the use of wrong measurement tools can lead to erroneous results thereby misleading management in decision making (Lee and Wong, 2015). A well-designed performance measurement helps the management to better understand their organisation and set goals and working methods (Chinta, Kebritchi and Elias, 2016).

KM in academic sector is often measured in terms of academic performance which is a function of management performance, students' performance, academicians' performance and others (Russli and Kassim, 2012). Measuring competences in tertiary institutions has become a major issue due to their relevance to ensure that organisations can create and manage the needed knowledge to perform successfully (Conchado, Carot and Bas, 2015). Lashkary *et al.* (2012) maintained that measuring organisation status required an apt scale framework that would evaluate KM based on its readiness. Meanwhile, the effect of knowledge enablers on the operation of organisational KM

processes is yet to be explored (Ho, Hsieh and Hung, 2014). Therefore, Ho, Hsieh and Hung (2014) in their study, adopted the process view in exploring the abilities of enabler capability in enhancing KM performance.

There are numerous models and tools proposed by different researchers to measure KM performance but there is no standardized agreement due to the KM complexity (Lyu, Zhou and Zhang, 2016). There is also a high number of research interests in KM as well as complimentary efforts from educational sectors but focus is less on empirical studies of knowledge orientation measurement. Hence, Anvari *et al.* (2011) investigated levels of KM based on the four elements of enabler capability – culture, technology, information and skills. They applied quantitative and qualitative methods to analyse data obtained from 124 participants and reported that there was a significant difference in the awareness and experience of KM amongst the lecturers and staff.

Lee and Wong (2015) exploited two different models. First model categorised its measurement indicator into three groups – human capital, structural capital and relational capital while the second model was based on four dimensions – financial, customer, internal business process and learning and growth. The authors extended these two models to propose a dependable and effective KMPe measurement model for small and medium organisations, and developed measuring indicator from the three most important aspects of KM – Knowledge resources, KM processes and KM factors. The measuring scale was adjudged effective, dependable and appropriate to evaluate KM performance.

Tan and Wong (2015) investigated the impact of KM on performance of Malaysia manufacturing companies using KM processes, KM factors and KM resources as measuring scale. They applied structural equation modelling for data analysis and discovered that the three KM metrics (processes, factors and resources) were interrelated and could influence the performance of manufacturing companies in Malaysia. Following this was the study of Lyu, Zhou and Zhang (2016) that proposed a framework to evaluate KM performance by integrating balanced scorecard (BSC) and fuzzy comprehensive evaluation (FCE) methods. The research investigated the practicality of the BSC's approach in enterprise KM and proposed a performance evaluation model based on the approach. The relevance and efficiency of the model were evaluated using FCE and the results confirmed that the model was effective to evaluate KM performance in enterprises.

Similarly, Tongsamsi and Tongsamsi (2017) designed a model to measure the personal KM level by categorising the designed instruments into four processes – acquisition, dissemination,

conversion and application. The study adapted Partial Least Square Structural Equation Modelling and SmartPLS 2.0 program to evaluate the process and discovered that only two out of the four acquisition and conversion processes passed the instrument reliability and validity test. This implies that only these two processes could be used to evaluate the individual KM.

Naser, Al Shobaki and Amuna (2016) evaluated the maturity level of KM to determine the most effective KM factor that could enhance the organisation performance in Al-Azhar University, Palestine. Asian productivity organisation model was designed to measure the KM maturity and surveyed data were analysed with ANOVA, Simple Linear Regression and Step Wise Regression. The findings proposed KM Maturity as a suitable measurement and presented people, leadership, knowledge process, KM outcomes and processes as important factors of high performance.

Makambe and Pellissier (2015) also proposed a KM model to measure the awareness level of KMP in Botswana's private higher education institutions through observing the availability of knowledge enablers in the institution. Adopting Mixed methods approach and triangulation research design, the study revealed that knowledge enablers (leadership, organisation culture and structure) (section 2.2.3) were absent (in the institutions investigated) as all the components of knowledge enablers that promote KM effectiveness were inactive. Hence, organisation, leadership and culture were proposed as knowledge enablers to enhance the state of KM.

Bekele and Jimma (2013) presented an evaluation on the level of KM practices in Jimma University and based its assessment on leadership, technology, learning and organisation, all of which are considered as the KM enablers. The study adopted mixed methods and survey design to discover that there were differences in the awareness level of KM practices among the university staff, and that technology was efficient while leadership was still battling with series of challenges.

2.8. Models adopted for this study

Several models (Chang and Chuang, 2011; Sánchez *et al.*, 2013; Draganova and Doran, 2014; Ho, Hsieh and Hung, 2014) have been developed in this domain but they may not be applicable to the Nigerian settings due to peculiar challenges (such as cultural differences, political and economic instability) facing the developing countries, hence, the need for a new model to accommodate these challenges. However, for effectiveness and achievement of purpose, the New Integrated KM Model (NIKMM) is made up of the following three existing models – KM solution and KM foundation (Becerra-Fernandez and Sabherwal, 2010), Knowledge Management Capability (KMC) and

Organisational Knowledge Effectiveness (Bharadwaj, Chauhan and Raman, 2015) and KMC and Firm Performance (Chang and Chuang, 2011).

2.8.1. KM Solution and KM Foundation

Becerra-Fernandez and Sabherwal (2010) model viewed KM practice from the perspectives of KM solution and KM foundation (figure 2). KM solution consists of KM systems and processes while KM foundation entails KM supporting factors (KM infrastructure, mechanisms, and technologies). This model was embraced to be the integral part of the new model because it introduced KM system as one of the component.

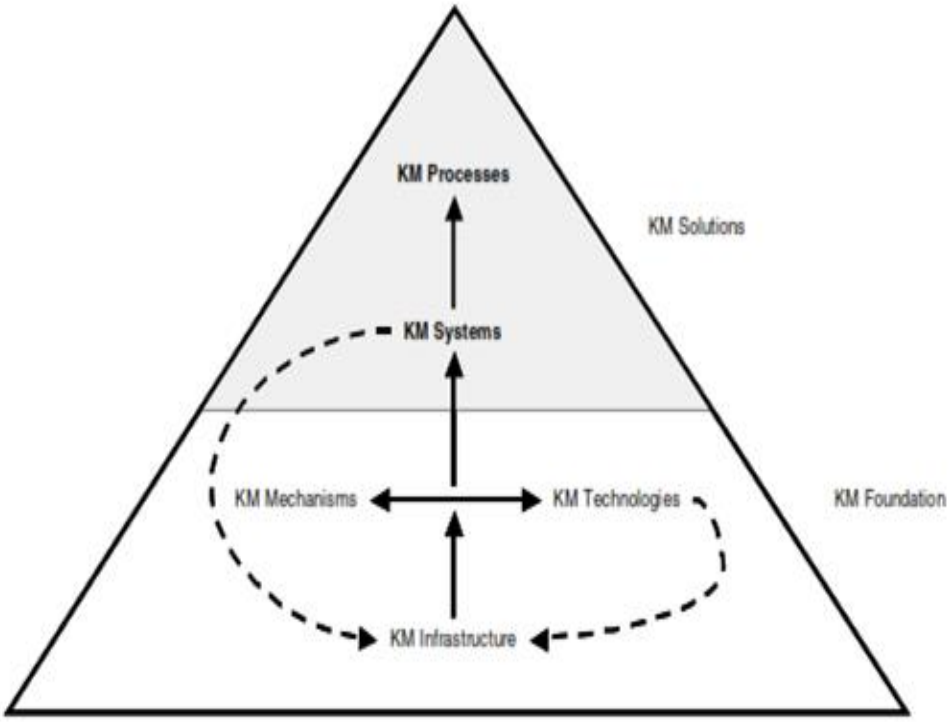

Figure 2: KM Solution and KM Foundation Model (Becerra-Fernandez and Sabherwal, 2010)

2.8.2. KMC and Organisation Knowledge Effectiveness

Bharadwaj, Chauhan and Raman (2015) model provides a theoretical framework that links KM process capability, enabler capability and organisational knowledge effectiveness together. The model as depicted in figure 3 proclaimed that enabler capability and process capability have positive effect on organisation knowledge effectiveness. It is integrated into NIKMM – the new KM model because it lays emphasis on enabler and process as supporting factors for knowledge effectiveness.

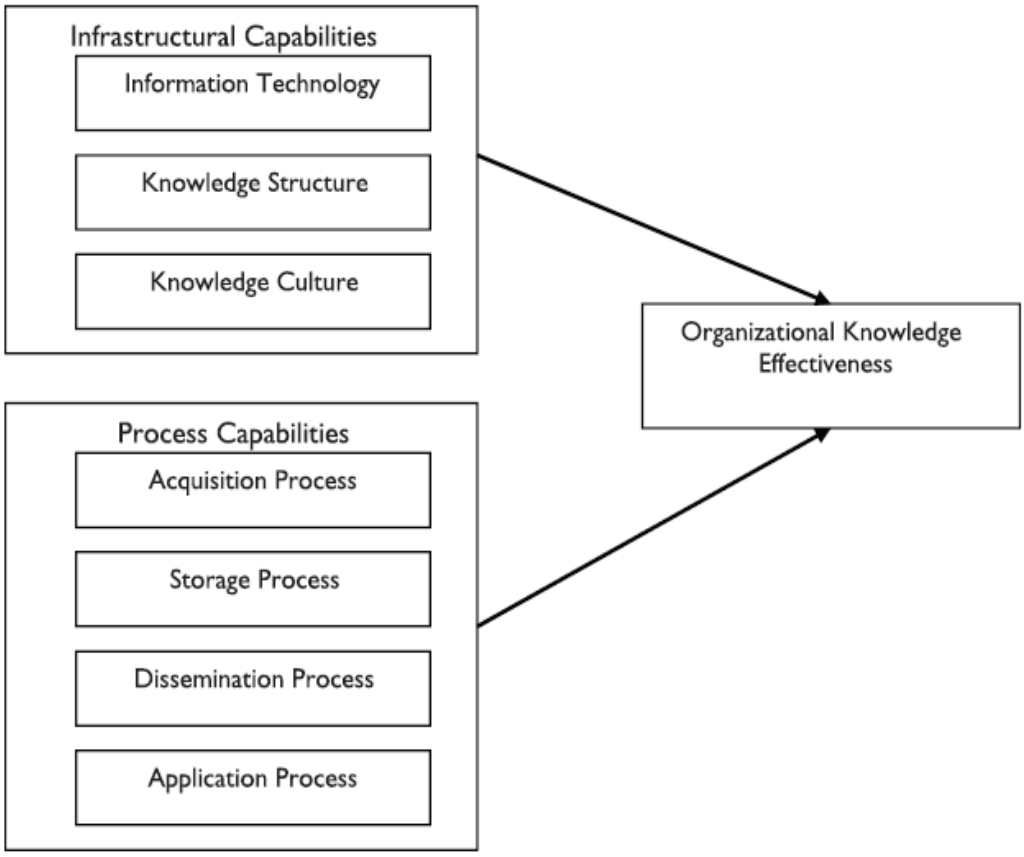

Figure 3: KMC and Organisational Knowledge Effectiveness Model (Bharadwaj, Chauhan and Raman, 2015)

2.8.3. KMC and Firm Performance

Chang and Chuang (2011) model provides a theoretical framework that links KMC (process capability, enabler capability, strategy capability) and organisational performance together. The model as shown in figure 4 admits that both enabler capability (culture, structure, people and information technology) and strategy capability have effect on process capability, and process capability has an impact on organisational performance. It is adopted as an integral part of the new KM model proposed in this study because of its emphasis on enabler and strategy as supporting factors for knowledge process.

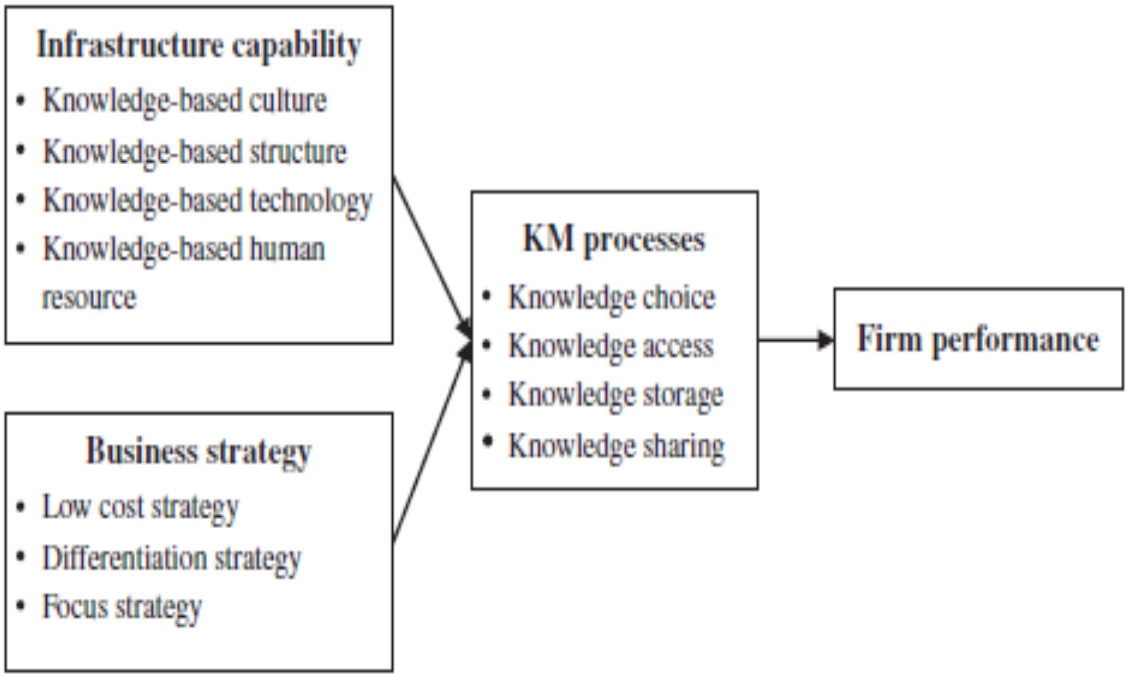

Figure 4: Model on KMC and Firm Performance (Chang and Chuang, 2011)

2.9. Summary:

The main focus of this study is to examine the influence of KM practice on academic performance. In this regard, this chapter reviewed past related works on the impact measurement, research framework and KM models for KM success in Nigerian institutions. The following salient facts were discovered from the reviewed literature. Firstly, the review showed that there is no specific definition for KM and the existing definitions have no much difference. Secondly, it was also revealed that there are no precise components for both process capability and enabler capability. Thus, this study presented the most common and acceptable elements amongst the researchers as variables to be considered for testing the hypotheses stated in chapter one. Thirdly, it was discovered that funding was not considered as one of the variables for success implementation of KM practice, but this study found funding as a necessary factor due to the political and economic challenges in Nigeria. Fourthly, it was discovered that only few studies have been reported on KM awareness level and KM success implementation in Nigeria. Lastly, the effect of KM towards academic performance enhancement was discussed and different types of KM models were deliberated.

CHAPTER THREE

Theoretical Model

3.1. Introduction

The purpose of the study is to examine the impact of KM practice on academic performance in south-west Nigerian tertiary institutions. This is with a view to developing a KM model that may be adopted in Nigerian tertiary institutions for effective KM practice towards academic performance enhancement. The chapter is grouped into four sections but all discussing theories guiding this study. The first section discusses conceptual framework and the second section elaborates on the theoretical framework to present the research hypotheses. The third section is all about the proposed conceptual model while the last section summarises the entire chapter.

3.2. Conceptual Framework

Figure 5 represents the conceptual framework for the study. It depicts contributory variables to KM success which are the same factors that promote academic performance especially in tertiary institutions. The framework is grouped into three components – KMC, KMSU and AP. To examine the relationship among these components the variables are categorised into three. The first category examined the relationship among KMC components - process capability (PC), enabler capability (EC), strategy capability (SC) and KM success (KMSU) - which consist of only one dependent variable - KMSU but eleven independent variables -namely leadership (LE), people (PE), technology infrastructure (TI), organisational process (OP), knowledge sharing (KSH), knowledge storing (KST), knowledge capturing (KCP), knowledge reuse (KRU), policy (PO), planning (PL), fund (FD) The second category consists of three independent variables (PC, EC, SC) and only one dependent variable (AP) to investigate the relationship between KMC and AP. Similarly, the third category examined relationship between KMSU and AP key indicators but consists of one independent variable (KMSU) and four dependent variables - innovativeness (INN), increased research output (IRO), performance increase (PI) and grounded graduate (GG). All these variables were used to formulate the research construct as shown in section 3.3.

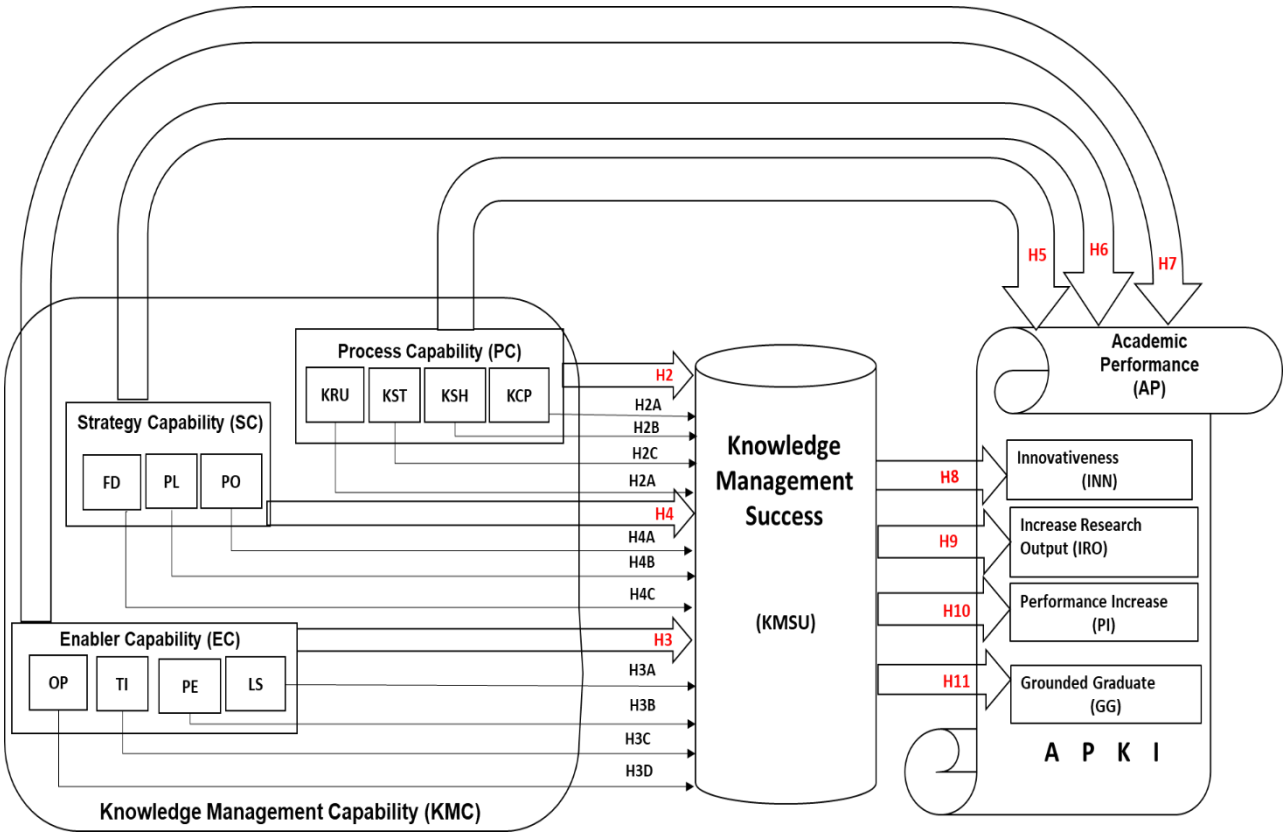

Figure 5: The Conceptual Framework (Own Compilation)

3.3. Theoretical Framework

The theoretical framework for the study is grouped based on the research questions and objectives as discussed in section 1.3. This study is guided by the model discussed in section 2.8, and the following research hypotheses are formulated to address the research questions:

3.3.1. Hypotheses for RQ1

Only one hypothesis and two sub hypotheses were raised:

Hypothesis 1	The awareness level of KM is high in Nigerian southwest tertiary institutions
Hypothesis 1A	There is a linear relationship between the KM awareness level, KM familiarity and KM current status in Nigerian southwest tertiary institutions.
Hypothesis 1B	There is a significant difference in the awareness level of academic status in Nigerian southwest tertiary institutions.

3.3.2. Hypotheses for RQ2 and RQ3

The common variables as identified in literature reviewed (chapter two) were used to formulate these hypotheses. These include knowledge capturing, sharing, storing and reusing (considered for process capability); technology infrastructure, people and organisational process (considered for

enabler capability); planning and policy (taken for strategy capability); and due to economic and political instability in Nigeria, leadership is considered for enabler capacity while funding is for strategy capacity. Thus, these variables are grouped into three - process capability, enabler capability and strategy capability.

3.3.2.1 Process Capability (PC)

Hypothesis 2: Process capability has linear relationship with KM success.

This study considers process capability as an independent variable and KM success as dependent variable. Sangari, Hosnavi and Zahedi (2015) recognised KM process capability as a powerful tool, and calls for a hypothetical test (H2) of its contributions towards KM success. Hence, four factors were identified as the process capability variables, and transposed to the following four sub hypotheses.

- Hypothesis 2A: Process Capability (Knowledge Capturing) influences KM success positively.

Knowledge capturing is considered as the independent variable and KM success as dependent variable.

- Hypothesis 2B: Process Capability (Knowledge Sharing) influences KM success positively

Knowledge sharing is the independent variable and KM success is dependent.

- Hypothesis 2C: Process Capability (Knowledge Storing) influences KM success positively

Knowledge storing is considered an independent variable here while KM success is a dependent variable.

- Hypothesis 2D: Process Capability (Knowledge Reuse) influences KM success positively

Knowledge reuse is an independent variable and KM success is a dependent variable.

3.3.2.2 Enabler Capability (EC)

Hypothesis 3: Enabler Capability has linear relationship with KM success.

Considering KM enabler capability as an independent variable and KM success as a dependent variable, four factors of enabler capability were identified to formulate the following four sub hypotheses. To examine the influence of enabler capability, the following four hypotheses are drawn for each of the enabling factors (leadership, people, technology infrastructure and organisational process).

- Hypothesis 3A: Enabler Capability (Leadership) influences KM success positively.

This hypothesis considers leadership as an independent variable, KM success as a dependent variable, and Leadership is recognised as a powerful enabler for knowledge dissemination (Asrar-ul-haq and Anwar, 2016). Strong top management supports will therefore enrich the process capability culture (Aziz, Lotfi and Dahlan, 2015). Hence, hypothesis 3A is drawn to investigate the influence of leadership on KM success in tertiary institution.

- Hypothesis 3B: Enabler Capability (People) influences KM success positively

This hypothesis considers people as an independent variable and KM success as dependent variable. According to Sánchez *et al.* (2013), it is the responsibility of people to use their expertise, skills and abilities to create new concepts and ideas. Thus, this construct is used to investigate people's influence on KM success in tertiary institutions.

- Hypothesis 3C: Enabler Capability (Technology Infrastructure) influences KM success positively

In this case, technology is considered as an independent variable while KM success is considered as a dependent variable. Technology infrastructures are powerful tools used to enhance leaning, teaching, research and increase workforce productivity (Draganova and Doran, 2014; Gyaase, Anane and Armah, 2015). The hypothesis is hereby designed to test the contribution of technology to KM success.

- Hypothesis 3D: Enabler Capability (Organisational process) influences KM success positively

This hypothesis considers organisational process as an independent variable but KM success as dependent. According to Ganesh, Mohapatra and Nagarajan (2014), organisational process is a facilitator that can secure knowledge in a standardized way. Thus hypothesis 3 is developed to measure the contribution of organisational process to KM success.

3.3.2.3 Strategy Capability (SC)

Hypothesis 4: Strategy Capability has a linear relationship with KM success

In this case, strategy capability is considered as an independent variable while KM success is dependent. Dalkir (2011) recognised strategy capability as an ingredient needed for achieving organisation learning and continuous improvement. Strategy capability is regarded as a key factor to sustain KM success. Three factors are identified as variables for strategy capability which calls

for hypothetical testing H4. The three hypotheses are drawn as follows for each of the strategy factors (Policy, Planning and Funding).

- Hypothesis 4A: Strategy Capability (Policy) influences KM success positively

This hypothesis considers policy as an independent variable and KM success as a dependent one. Since success in organisational knowledge management can be achieved through formalizing strategic policy (Mohajan, 2017), the construct will test the contribution of policy towards KM success in tertiary institution.

- Hypothesis 4B: Strategy Capability (Planning) influences KM success positively

Planning is considered as the independent variable while KM success is the dependent one. Dalkir (2011) acknowledged that strategy planning is indispensable for learning and continuous improvement in an organisation. Hence, hypothesis 4B is raised to test the influence of planning as strategy capability on KM success.

- Hypothesis 4C: Strategy Capability (Funding) influences KM success positively

Fund is considered as an independent variable while KM success is dependent. It is considered significant to the survival and performance of any institution (Famade, Omiyale and Adebola, 2015). "Since it is a global presumption that adequate funding of education at all levels determines the quality of the educational system of any nation" (Ololube, 2016:334), this hypothesis is required to examine the influence of fund as strategy capability on KM success.

3.3.3. Hypotheses for RQ4

Observations are conducted from two influential perspectives - KM capabilities (KMC) on academic performance (AP) and KM success (KMSU) on academic performance key indicators (APKI).

3.3.3.1 KM Capabilities and Academic Performance

The influence of KM capabilities on academic performance is measured through the following hypotheses:

- Hypothesis 5: Process Capability (knowledge capturing, knowledge sharing, knowledge storing and knowledge reuse) has a significant relationship with academic performance.

Hypothesis 5 is used to investigate the effect of process capability which is considered as independent variable on academic performance (dependent variable).

- Hypothesis 6: Enabler Capability (leadership, people, technology infrastructure and organisational process) has a significant relationship with academic performance.

This hypothesis is designed to test the influence of enabler capability on academic performance. Enabler capability is an independent variable while academic performance is a dependent variable.

- Hypothesis 7: Strategy Capability (Policy, Plan and Fund) has a significant relationship with academic performance.

This hypothesis considered strategy capability as an independent variable and academic performance as dependent to test the impact of strategy capability on academic performance.

3.3.3.2 KM Success and Academic Performance Indicators

The influence of KM Success on Academic Performance Key Indicators (increased research output, grounded graduate, performance increase and innovativeness) is measured with the following hypotheses:

- Hypothesis 8: KM success has a positive influence on APKI - Increased Research Output.
- Hypothesis 9: KM success has a positive influence on APKI - Grounded Graduate.
- Hypothesis 10: KM success has a positive influence on APKI - Performance Increase.
- Hypothesis11: KM success has a positive influence on APKI - Innovativeness.

The hypotheses 8-11 consider KM success as an independent variable and academic performance (AP) as a dependent variable. Successful KM increases the performance of the entire university community through improved learning and innovation processes, effective knowledge sharing, increased competitive advantage, quick decision making and problems solving (Nawaz and Gomes, 2014; Dhamdhere, 2015; Sharma, Chadee and Roxas, 2016). Sharing professional knowledge and experience also increases job performance (Masa'deh *et al.*, 2017) and promotes academic performance amongst the active students (Masrek and Zainol, 2015). Hence, H8 -11 is required to test the impact of KM success on academic performance indicators (increased research output, grounded graduate, performance increase and innovativeness).

3.4. Proposed Conceptual Model for the Implementation of KM Practice

This author is aware that knowledge should be properly managed because its implementation in higher institutions always poses a great challenge. Hence, a KM success model is designed for Nigerian institutions to make knowledge easily accessible when needed by linking all components of KM capability to institutional knowledge. This model, as discussed in section 2.8, is the integration of the three (3) existing models - KM solution and KM foundation, KM capability and organisational knowledge effectiveness, and KM capabilities and firm performance. The integrated

model is incorporated into the universities' activities to enhance academic performance and promote best practices.

For reasons discussed in section 2.8, the existing models summarized on Table 3 were integrated to form the New Integrated Knowledge Management Model (NIKMM) depicted on Table 4 and figure 6.

Table 3: Existing Models Analysis (Own compilation)

Model	PC	KMS	IC/EC	BS/SC	OKE/KMPE	OP/AP
KM solution and foundation	✓	✓	✓			
KM capability and organisation knowledge effectiveness	✓		✓	✓		✓
KM capability and firm performance	✓		✓		✓	

Table 4 New Integrated Model Table (own compilation)

Model	OK	PC	KMS	IC/EC	BS/SC	OKE/KMPE	OP/AP
NIKMM	✓	✓	✓	✓	✓	✓	✓

NIKMM (figure 6) consists of all the layers in the existing models plus one new layer (Organisational Knowledge (OK)) making up seven layers in total and using the strength of the integration to accommodate its shortcomings. It addresses the knowledge gap challenges on the old models as summarised in Table 3.

3.4.1. Organisational Knowledge (OK)

Organisational knowledge could be tacit or explicit and may be used in combination to generate organisational or institutional knowledge. The first layer is all about the available knowledge flow in the institution which must be evaluated and protected since OK is the basis for institution's uniqueness.

3.4.2. Process Capability

Process capability consists of four stages - knowledge capture, sharing, storage and reuse - all of which are based on the principles of network and computer reasoning.

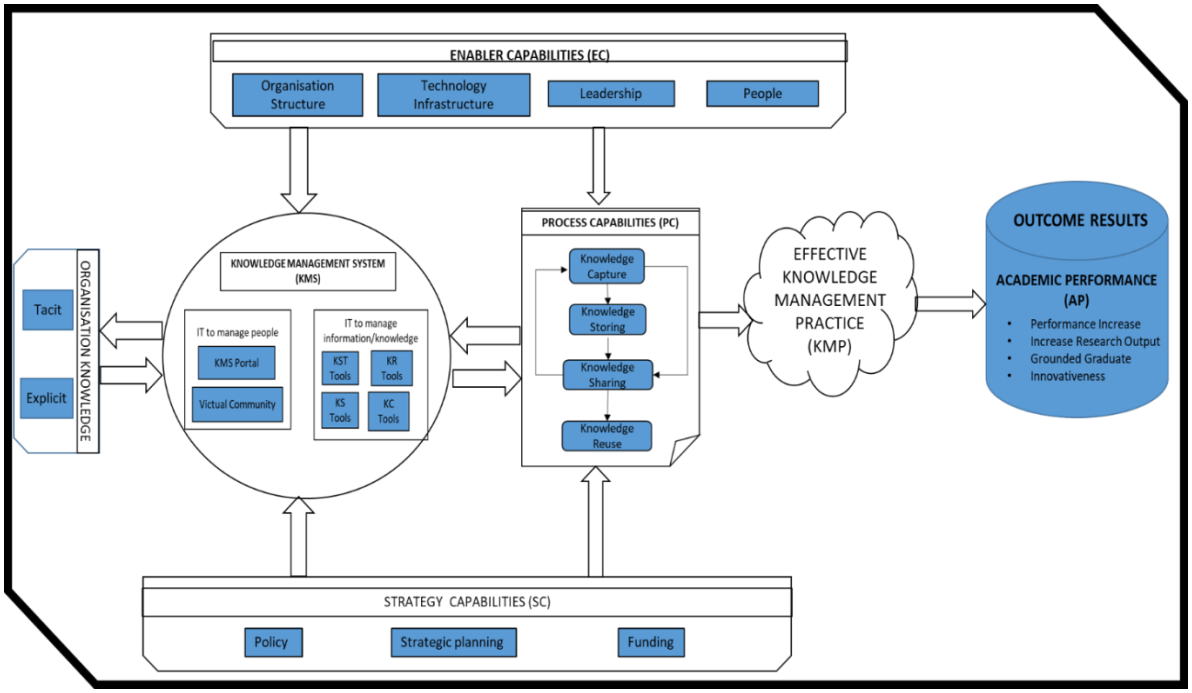

Figure 6 The New Integrated KM Model (Own Compilation)

3.4.2.1. Knowledge Capture (KCP)

Knowledge Capture (KCP) has to do with knowledge acquisition and knowledge creation towards knowledge capturing. There is a lot of knowledge flow in the tertiary institutions that need to be captured; junior lecturers need to acquire knowledge from their superiors and students are expected to acquire and create new knowledge as well.

Knowledge acquisition is all about making knowledge available either through documents or in a tacit form; it is an act of importing knowledge from external resources into an organisation (Dhamdhere, 2015; Sharma, Chadee and Roxas, 2016; Mohajan, 2017). Knowledge can be acquired by attending seminars, conferences, workshops, exhibitions, and through best practice from other tertiary institutions. It may also be acquired through blogs, consultants, videoconferencing, and websites. Therefore, based on computer reasoning and network principles, an expert forum and knowledge directories system where staff can acquire and share knowledge could be created. That is, a community of interest and electronics discussion forum where group of like minds can share knowledge.

It is important to note that knowledge creation is also a coming together of people with same skills, abilities, competence or specific information in order to generate new ideas or concepts and innovative products (Sánchez *et al.*, 2013). It is a continuous process created by individuals and occurs during interaction with each other. Grouping people to form a community is therefore a

roadmap to knowledge creation because new ideas, concepts, and innovations are derived to help the staff and students in their daily operation and subsequently increase their academic performance.

3.4.2.2. Knowledge Sharing (KSH)

Knowledge Sharing (KSH) is also referred to as knowledge transfer which is the building block for an organisation's survival (Witherspoon *et al.*, 2013) and remains the most important of all the KMPs (Asrar-ul-haq and Anwar, 2016). Knowledge can be shared in the institution through memos, instructions, group discussions, internal meetings, seminars, workshops, conferences and knowledge portal. The more an institution shares knowledge among its components the more enriched and refined she is, and the more competitive advantage she has over her counterparts. Knowledge sharing, therefore, bridges the gap of communication between the group members thereby enhancing their activities and performance (Peng, Jiang and Zhang, 2013:98).

3.4.2.3. Knowledge Storing (KST)

Knowledge Storage (KST) includes knowledge codification, storage, classification, review, update and refining in an appropriate format for easy access by others in an organisation (Muhammad *et al.*, 2011; Russli and Kassim, 2012). It is all about computer reasoning and network principles where new ideas, concepts and innovations obtained from stage one are encapsulated and stored in the knowledge warehouse or repository for future use. For easy access to knowledge therefore, tertiary institutions provide knowledge portal where knowledge is made available for all the stakeholders.

3.4.2.4. Knowledge Reuse (KRU)

Knowledge Reuse (KRU) as a stage after the actual application of knowledge occurs when embedded knowledge is used or applied to achieve goals and objectives of the institution. Knowledge entrenched in the organisation is just a piece of information if not properly applied and reused. Thus, KRU promotes efficiency as employees are equipped with information that guides their decision making, action and problem-solving towards enhancing organisational performance as a daily routine.

3.4.3. Knowledge Management System (KMS)

KMS is usually developed with ICT tools to support KM process capability. In this study, it is viewed from two perspectives - KMS to manage people and KMS to manage information. KMS to manage people provides an avenue for communication, interaction and collaboration in a community or among people of like manners. This is possible when KM portal is available as well

as victual communities that consist of community of practice (COP), share learning, expert location and community of interest (Assegaff, Hussin and Dahlan, 2013). Meanwhile, KMS to manage information or knowledge consists of necessary tools to capture, share, store, and keep tract of the feedback.

3.4.4. Enabler Capability (EC)

Another phase in the NIKMM is the enabler or infrastructural capability which also contributes positively to the success of KM as it is a solution for knowledge transmission within the institution community. Based on some literature reviewed in chapter two, this research work proposes leadership, people, technology, and organisational process as enabler capability.

3.4.4.1. Leadership (LE)

Leadership (LE) is an influential element that promotes knowledge sharing and transfer. According to (Munir and Rohendi, 2012), commitment of leadership of an institution can lead to enrichment of knowledge creation and sharing culture. To encourage KM success therefore, leadership management of an institution must be ready to share personal knowledge and give incentive to the knowledge contributors.

3.4.4.2. People (PE)

People (PE) are the knowledge carrier and the element of survival for tertiary institutions. Interaction among the people in an organisation also generates new knowledge for innovation and the staff members are expected to use their expertise, skills and abilities to create new ideas, concepts and innovation which may also generate new knowledge. Any institution that wants to gain increased competence in the market must therefore value its human capital (Tan and Wong, 2015), and put in place a mechanism to draw people into the knowledge process.

3.4.4.3. Technology Infrastructure (TI)

Technology Infrastructure (TI) is a set of technological tools and resources used for information creation, storage, management and communication (Gyaase, Anane and Armah, 2015:1). Technology cannot be waved aside as it provides necessary tools to implement knowledge processing. Sulisworo (2012) sees technology as a moderator factor that connects tertiary institutions processes with the KM processes to achieve institutional goals. Successful KM requires technological supports to make KM easier for the institutions' community.

3.4.4.4. Organisational Process (OP)

Organisational Process (OP) is a driving force that straps up knowledge within the organisation in a standardized way (Ganesh, Mohapatra and Nagarajan, 2014); it is a set of activities organised by

the institution to share information and knowledge for a successful knowledge processing (Laal, 2011). These activities include: organisational structures, control measures, re-engineering administrative procedure, curriculum development process, information sharing pattern, information silos, salary incentives, metric and other work practices that affect information flow.

3.4.5. Strategy Capability (SC)

Strategy Capability is in two dimensions – policy or planning and fund.

3.4.5.1. Policy and Planning

Policy and planning are all about a policy set up to manage institutional knowledge. To make KM a success, the institution must develop a policy and strategic plan to serve as a guideline for managing knowledge in the institution. In building the strategy, the institution must carry out knowledge audit to know the exact knowledge required and useful to the institution. Gap analysis must also be conducted to differentiate between the existing and desired KM status and finally, road map must be developed to categorise KM tools and approaches. These developed policies and many more were developed to make KM strategy a powerful enabler and a great contributor to KM success.

3.4.5.2. Funding

Funding is the institution's live wire (Ololube, 2016) as it provides the means of purchasing necessary resources needed and aids infrastructural development, ICT resources acquisition, and hiring specialists in different fields. Ololube (2016) discovered that the inadequate funding was a major problem facing Nigerian higher education therefore for KM to be more effective in tertiary institutions in Nigeria; funds must be adequately allocated to KM.

3.4.6. KM Intermediate Outcome

KM effectiveness is determined by the KM intermediate products such as improved communication, enhanced collaboration, improved employee skills, better decision making, and improved productivity (Bharadwaj, Chauhan and Raman, 2015).

3.4.7. Academic Performance

KM is a process that retrieves, protects, uses and manages existing knowledge to achieve the institutional objectives and goals towards increasing the institutional performance (Sharma and Kaur, 2016). The success of KM has its root in the institution's capability to develop systems, processes and conducive environment that promote learning, create knowledge, share and reuse the organisation and personal knowledge (Pancholi and Pancholi, 2014).

To achieve this, a system must be developed to support KMP and connect people to the required knowledge. At the same time, the institution must have a strategic plan and organised activities that encourages information sharing and accessibility. The management must be committed and the institution must be well funded to provide all necessary resources. The contributions of the KMP leads to KM success and when the principle of KM is applied, it boosts and enhances the quality of academic learning process, creates innovation, increases performance, increases research output and produces grounded or employable graduate.

3.5. Summary

In achieving the purpose of the study, this chapter presented the conceptual and theoretical framework. The conceptual framework was presented in figure 5 and short interpretation of the figure was given. Also theoretical framework was discussed in this chapter and eleven hypotheses was formulated to examine the relationship between the independent and dependent variables presented in the chapter. Furthermore, the chapter presented a conceptual model for effective KM practice in tertiary institutions in Nigeria.

CHAPTER FOUR

Research Methodology

4.1. Introduction

The chapters two and three identified the contributing variables to effective KM practice and academic performance which led to formulation of the research hypotheses. Having established the study's research framework, this chapter discusses the details of the research methodology adopted as well as the research instruments used. The chapter is divided into fourteen sections, and a roadmap depicted in figure 7 was developed to conduct the study.

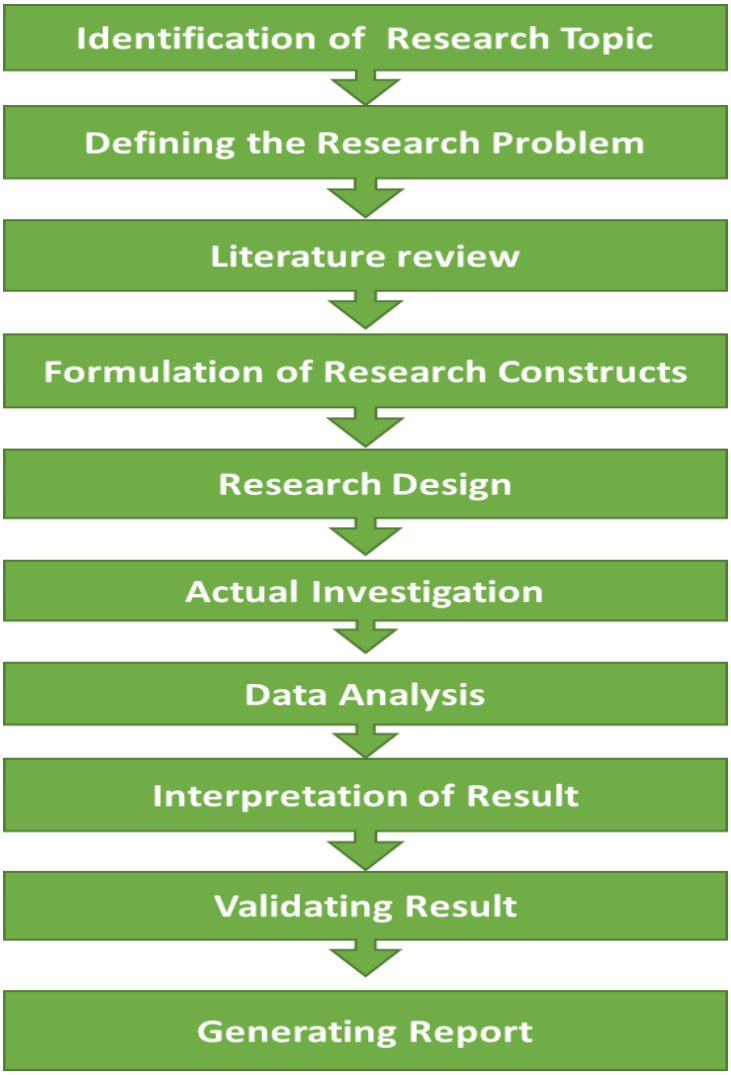

Figure 7 Research Roadmap (Own Compilation)

4.2. Research Paradigm

A research paradigm is a philosophical framework that sheds light on how scientific research ought to be conducted (Collis and Hussey, 2014), and represents a basic set of beliefs that controls and

monitors inquiries of a precise study. It is also a theoretical framework that provides reliable structure to guide researchers in addressing their study questions or hypotheses. Creswell (2014) grouped research paradigm into post-positivism, constructivism, transformative, and pragmatism with each having its own unique characteristics as depicted on Table 5.

Table 5: The research philosophies *(Creswell, 2014:36)*

Post-positivism	**Constructivism**
• Determination • Reductionism • Empirical observation • Theory verification	• Understanding • Multiple participant meanings • Social and historical construction • Theory generation
Transformative	**Pragmatism**
• Political • Power and justice oriented • Collaborative– • Change-oriented	• Consequences of actions • Problem-centered • Pluralistic • Real-world practice oriented

4.2.1. Post-positivism

In post-positivism, research is conducted in a value freeway where the researcher maintains an objective stance which makes the research data independent (Saunders, Lewis and Thornhill, 2012). The affairs of post-positivism is ruled by laws or theories which need to be proved in order to have a good understanding of the world (Creswell, 2014). Post-positivists use observation and experiment to develop true knowledge (Rahi, 2017) but it is important to investigate the individual behaviour and develop a numerical measure of the observation (Creswell, 2014).

4.2.2. Constructivism

Constructivism is referred to as interpretive, social constructivism or qualitative research. It depends on the participants' views of the problem statement which allows the participants to make available meanings of their experiences independently (Rahi, 2017). The followers of constructivism believe in in-depth understanding of the concept of their research and seeking understanding of the world within their domain (Creswell, 2014). This paradigm subsequently generates theory and claims that true knowledge can only be achieved through deep interpretation of the subject.

4.2.3. Transformative

Transformative paradigm came on board in the 1980s and 1990s from the individual that believes that post-positivism marginalises people and does not handle political issues properly (Rahi, 2017). The paradigm centers on the needs of the marginalized individual or group in the society as its followers believe that the inquiry should be interwoven with the politics and society issues (Rahi, 2017). According to Creswell (2014), embedded in the research are agenda to reform and change the lives of respondents, their domain as well as the life of the researcher. Hence, the participants may assist to design the question, collect and analyse data.

4.2.4. Pragmatism

Pragmatism came into existence after the paradigm war between positivism and constructivism, and made way for the two paradigms to work together towards providing the best answers to research questions (Denzin, 2010). It is based on the abduction reasoning which moves in between deduction (quantitative approach) and induction (qualitative approach) reasoning (Venkatesh, Brown and Bala, 2013). Pragmatism is unlimited to a particular philosophy or assumption (Rahi, 2017), and utilises all available approaches to fully understand the research problem considered most important determinant (Creswell, 2014).

Pragmatists recognise that there are varying ways of interpreting the world and undertaking research, implying that a single point of view cannot give the entire picture since there exists multiple realities (Saunders, Lewis and Thornhill, 2012). Pragmatism does not necessarily affiliate to any system or philosophy (Rahi, 2017); researchers freely use both quantitative and qualitative approaches for data collection and analysis. They believe that true knowledge can be obtained by mix method approach (Rahi, 2017). It is also considered most appropriate for this study due to its applicability of multiple methods, assumptions and philosophies (Creswell, 2014).

4.2.5. Rationale for choosing Pragmatism

Information System is a new developing field which borrow paradigm from older established field (Hasan, 2003). Each paradigm has a different perspective on the axiology, ontology, epistemology, methodology, and rhetoric of research (Kaushik and Walsh, 2019). However, there is no specific paradigm underpin for information system as its interdisciplinary nature allows the uses of theory from both social science (constructivism) and natural sciences (post-positivism) to understand phenomena (Jokonya, 2016; Costello, 2017). Information system is believed to be trans-disciplinary field which resulted in the adoption of pragmatism as fundamental approach in IS (Goldkhul, 2012; Zyl, 2015). Goldkhul (2012) therefore argued that the paradigm of pragmatism should be regarded

as a stream of IS research in the same way as post-positivism and constructivism. The freedom granted to pragmatist to select an appropriate methodology for a particular research question, which can also take the form of a mixed method approach make this paradigm suitable for this research.

4.3. Research Approach

According to Mohajan (2017) a research approach is a laid-down procedure and plan of action put in place to efficiently and systematically guide the conduct of the research. There are three common research approaches namely qualitative, quantitative and mixed methods

4.3.1. Qualitative Approach

Qualitative research is an approach that makes use of constructivism paradigm (Choy, 2014). It is considered as "a systematic scientific inquiry that seeks to build a holistic and largely narrative description for the researcher's understanding of a social or cultural phenomenon" (Astalin, 2013:118). The approach is based on inductive reasoning (Rahi, 2017) and focuses on the understanding of the participants' viewpoints and beliefs (Harwell, 2011). It has the ability to probe hidden value, beliefs and assumption (Choy, 2014), and capable of imploring open-ended questions for data gathering.

4.3.2. Quantitative Approach

Quantitative research involves a collection of data and subject information for statistical treatments in order to support or refute alternative knowledge claims (Creswell, 2014). As a post-positivism paradigm (Caruth, 2013) and deductive reasoning (Rahi, 2017), the research approach makes use of survey method for data gathering and created meaning via the objectivity exposed in data collected.

4.3.3. Mixed Methods Approach

Mixed method is an approach that uses district designs to collect and integrate both quantitative and qualitative data. It may require philosophical assumptions and theoretical frameworks to gain a better understanding of the phenomena being investigated (Hayes, Bonner and Douglas, 2013; Creswell, 2014). According to Caruth (2013:120) "mixing the methods can complement each other, offer richer insights, and result in more questions of interest for future studies". He posed further that mixing quantitative and qualitative research designs could uphold the strengths and better the weaknesses in both designs. This method differs from triangulation and multi-methods because it possesses the ability to combine two approaches in one research. This implies that mixed method draws the strengths of both the qualitative and quantitative approaches and uses the strength of one to complement the weakness of the other (Harwell, 2011). The combination of the two approaches

therefore bridges the gaps in addressing research questions (Harwell, 2011) and produces more complete knowledge required to form theory and practice (Caruth, 2013). Mixed method naturally provides stronger evidence for conclusion used to generate and test a grounded theory although, the approach is very expensive, time consuming and requires understanding of qualitative and quantitative research processes.

4.3.4. Rationale for choosing Mixed Methods Approach

The research approach (in IS) is either qualitative or quantitative. However, the introduction of pragmatism allowed the combination of both the qualitative and quantitative approaches in one research. Mixed method approach is not new in information system because so many researches (Mbhalati, 2010; Chigada and Ngulube, 2014; Mazorodze and Buckley, 2017; Oyerinde and Bankole, 2019) to mention few, adopted this research method in conducting their research. Being fully aware of the various existing research methodology types, this author considered the nature of her research problems as well as the target audiences in choosing a suitable research methodology. Since the in-depth understanding of the study is acquired by qualitative research while better objectivity and generalisation are obtained by quantitative research (Caruth, 2013), this study evaluates the participants' in-depth knowledge of KM and allows the individual to express themselves and raise issues on the subject matter. Similarly, taking the participants objectivity as material to the quality of primary data, the research employs statistical software (such as SPSS) which is a quantitative tool to determine the influence of dependent and independent variable on each other.

The Mixed methods approach is considered appropriate because of its proficiency in using both quantitative and qualitative practices in a single research (Caruth, 2013; Creswell, 2014; Beato and Velkova, 2017; Rahi, 2017). This offers an insight into the research questions and enriches the body of knowledge (Caruth, 2013). Similarly, the harmonisation of both the qualitative and quantitative approaches generates better results when compared to one approach (Choy, 2014). The result obtained from each approach may be used to challenge other results and possibly stimulate new direction for the study (Harwell, 2011) to eliminate limitation and bias (Choy, 2014). Formulation and testing of research hypotheses are therefore more grounded as qualitative findings shall be used to validate and enhance quantitative findings.

4.4. Research Design

Research design is a procedure employed in a research study for data collection, analyses, interpretation and reporting, and helps in research planning and implementation (Hayes, Bonner

and Douglas, 2013). Pragmatism research paradigm adopted for this study makes use of mixed methods approach that is categorised into six design types, namely, explanatory sequential, exploratory sequential, embedded, transformative, multiphase and convergent parallel design. Each of these is driven by the needs of the research question and are distinguished by its implementation, priority and data integration (Creswell, 2014).

4.4.1. Explanatory sequential mixed methods design

This method is a two-phase project because quantitative and qualitative data are collected and analysed separately at different times although, quantitative is considered first and given higher priority (Hayes, Bonner and Douglas, 2013). This design uses qualitative data gathered in the second phase to enhance the quantitative findings (Caruth, 2013; Hayes, Bonner and Douglas, 2013).

4.4.2. Exploratory sequential mixed method design

This method is opposite to explanatory sequential mixed methods design because the exploratory sequential mixed method has a strong qualitative background that gives a priority to qualitative data (Hayes, Bonner and Douglas, 2013). This design uses the qualitative data collected in the first phase to examine a phenomenon and then employs the quantitative data gathered in the second phase to illuminate the qualitative findings (Caruth, 2013).

4.4.3. Embedded mixed methods design

In this method both the quantitative and qualitative data may be collected and analysed sequentially or concurrently. However, the smaller dataset is implanted in the large dataset and the finding of the embedded smaller dataset (either quantitative or qualitative) is expected to support the finding of the larger dataset (Caruth, 2013; Creswell, 2014).

4.4.4. Transformative mixed method design

This design makes use of a “theoretical lens drawn from social justice or power as an overarching perspective within a design that contains both quantitative and qualitative data” (Creswell, 2014:44).

4.4.5. Multiphase mixed method design

Multiphase is examining issues over a number of studies (Caruth, 2013). Evaluation and program intervention often make use of this research method (Creswell, 2014).

4.4.6. Convergent parallel mixed method design

Convergent parallel mixed method is a one-phase project because it allows collection of both quantitative and qualitative data at the same time. This allows researcher to collect the two data types concurrently but analyse them separately to relate their findings to each other (Creswell, 2014:276). Both the quantitative and qualitative data are given equal weight and their findings are integrated at the interpretation phase. Convergent parallel mixed methods design is used to validate the research findings (Creswell, 2014).

4.5. Rationale for employing Convergent parallel mixed methods design

Mixed method research design is not new in IS as many researchers have made use of it extensively over decades (Mazorodze and Buckley, 2017; Oyerinde and Bankole, 2019). According to Kilani and Kobziev (2016), selecting appropriate research method is always a difficult task in information system and researchers should therefore be more particular about those methods that will help to accomplish the aims of their research. Two factors were presented to guide in the selection of the research method the characteristics of the research topic and time to conduct the research (Kilani and Kobziev, 2016). Considering this research objectives and time constraints, the convergent parallel mixed method is adopted. This research design is adopted in this study because both qualitative and quantitative data can be collected at the same time thereby saving time and cost. It is also suitable for a comprehensive data analysis and testing of the validity of research theories (Creswell, 2014). Structure questionnaire was adopted as a quantitative approach for quantitative data collection while unstructured questionnaire was the qualitative approach employed to collect qualitative data. This combined use of two different worldviews in one research makes our methodology more suitable than multi-method and triangulation.

4.6. Research Strategy

Research strategy is a plan of how research questions should be answered to achieve research goals and objectives (Saunders, Lewis and Thornhill, 2012). In his PhD thesis, Okesola (2014) regards research Strategy as a high guide on how a research is being planned, executed and monitored using appropriate methodology to address the study questions.

Research strategy in mixed methods can either be sequential or concurrent. In sequential strategy both quantitative and qualitative data are analysed separately while in concurrent strategy, they are gathered simultaneously and later merged to give an in-depth understating of research problems. Since tertiary institutions selected for this study are spread across several geographical locations in

Western Nigeria, the concurrent strategy is better adopted to save time and other resources while survey is employed for concurrent data collection.

4.7. Research Technique

There are different types of research technique (interviews, schedules, observation, etc.) and their application depends on the nature of the study at hand (Pandey and Pandey, 2015). However, for reasons stated in section 4.7.1, questionnaire is the research technique adopted in this study.

4.7.1. Questionnaire

Pandey and Pandey (2015:58) describe questionnaire as a systematic compilation of questions that are used as a device for securing required answers through information provided on the form by the respondents. Questionnaire may be structured (closed ended) or un-structured (open ended), both of which are adopted in this study. Since descriptive responses to open-ended questions are always qualitative (Kumar, 2011), the open ended (un-structured) questionnaire used to collect the narrative data in this work is qualitative while the numerical data collected through closed ended (structured) questionnaire is quantitative. Each of these instruments has its strengths and weaknesses but the combination of the two of them complements each other and increase the validity and dependability of data collected. Questionnaire is chosen as the research instrument because it is comparatively economical, easy and convenient especially when considering the number of participants involved and their widely spread locations.

4.7.1.1. Open-ended Questionnaire

Open-ended questionnaire consists of open questions that may require respondents explanations from his/her own perspectives (Walliman, 2011). Any descriptive responses gotten as an answer to open-ended questions are all qualitative (Kumar, 2011).

4.7.1.2. Closed-ended Questionnaire

Closed-ended questionnaire designs its questions along with the choice of answers and only permits the participants to pick answer from the allocated multiple choices. This method does not require special skill from the participants and poses less stress as the range of possible answer is limited to the options provided (Walliman, 2011).

4.7.2. Designing the Questionnaire

The questionnaire was formulated with Scales and dichotomous questions. Dichotomous questions (which require only a ‘yes’ or ‘no’ response) prompt the respondent to come clear on some

questions asked while Scales questions engages participants to have a thorough thinking on their proposed responses. The scale adopted was Four Likert scales ranging from 'Strongly Agreed' to 'Strongly Disagreed'. To ensure objectivity, completeness and clearness of the questions, the questionnaire starts from a simple to a complex question, and important terms were clarified. Questions were developed with short sentences to encourage participation and prevent ambiguity. The questionnaire is in five sections (A, B, C, D & E) with only section A dealing with respondent demography while sections B, C, D and E deal with the subject matter as contained in appendix E.

4.8. Pilot Study

A pilot study could be a "common practice to pre-test a questionnaire on a small sample of the potential respondent prior to its real administration" (Walliman, 2011:98). It is an act of attempting a research with a smaller sample as a test before conducting the actual research to ascertain the feasibility, reliability, usefulness and practicability of the research instrument. In this research work, sample data collected from Abraham Adesanya Polytechnic, Ijebu-Igbo and Tai Solarin College of Education, Omu-Ijebu, which are not part of the research population, were used for the pilot study. The results of the pilot study of 60 population size collected equally from the two institutions that are not part of the research population confirmed the research instrument to be reliable, consistent and acceptable.

4.9. Validity

Validity of the instrument is concerned with whether the instrument really measures what it is meant to measure. The quality of these instruments is very essential because research conclusion is drawn from information obtained through these instruments. In this study, content validity and triangulation were adopted.

Content Validity: The questionnaire was validated by both the research supervisor and the university-based statistician who is an expert in the field. This is to assess the items of the instruments for language clarity and appropriateness in addressing the research problems and questions. Comments, suggestions and corrections from the validators were used to construct the final draft of the instruments.

Triangulation: Triangulation embraces the use of both qualitative and quantitative methods of data collection in a single study. Data gathered through one technique may be biased, questionable or weak. Hence, mixed methods were deployed to increase the validity and reliability of the research instrument. This combined approach strengthens the validity process as one approach complements the weakness of the other.

4.10. Reliability

Reliability of research instruments has to do with the consistency, dependability and how replicable the results obtained are when used in a research work. Investigator's position, triangulation and audit trail were employed to measure the reliability of research instruments in this study. Using investigator's position, different phases and processes of inquiry were clarified, and the rationales behind the study design were elaborated. On audit trial, data gathering process and data analysis were elaborated to give a detailed interpretation of the research findings. As discussed in section 3.8, triangulation was employed to test the reliability of the research instrument.

4.11. Sampling

The procedure used to select a subset of the study population is discussed in this section. This includes the population size, sampling size and sampling type.

4.11.1. Population

The research population frame is 46 universities, which is the list of all accredited universities by National Universities Commission (NUC) in South West Nigeria while the total population is 550 comprising both academic staff and students of selected tertiary universities in South West Nigeria.

4.11.2. Sample and Sampling

For reasons respectively discussed in section 4.11.2.1 and 4.11.2.2, this study adopts both probability and non-probability sampling.

4.11.2.1. Probability Sampling

Stratified random sampling is adopted and considered most appropriate as the population is heterogeneous based on the ownership of the schools and the way the schools are being managed. To prevent data overload, only 10 out of the 46 accredited universities representing 24% of the total population were sampled. The stratified random sampling is applied as follows:

- Firstly, the population was grouped into three stratums - federal, state and private containing 7, 11, and 27 universities respectively;
- Secondly, the systematic random sampling was used to select item from each stratum; and
- Lastly, the size of each stratum was kept proportional to the sizes of the strata thereby resulting in picking two federal, three state and six private universities.

4.11.2.2. Non-Probability Sampling

The non-probability sampling method based the selection of the elements on researchers' decision instead of probability. Hence, purposive sampling was used to select the names of the 11 universities involved in the research as well as the participants who are basically the academic staff and students from the selected universities. To avoid data overload, only 20 academic staff members and 30 students were selected from each university totalling 550 (50 x 11) targeted participants. Purposive sampling was also adopted to save time and reduce traveling expenses due to the long distance between the universities.

4.12. Research Ethics

Ethical issues were considered from the respondents and researcher's perspectives. In line with UNISA's research ethics policy and prior to fieldwork, ethical clearance (appendix A) was obtained from the Research and Ethics Committee of the College of Science and Technology (CSET), University of South Africa (UNISA). All the participants were detailed about the objectives of the exercise (appendix B), and were asked to sign the consent form (appendix C). They were adequately informed that participation was voluntary and did not come with any form of incentives. The confidentiality of the data collected as well as the identity of the participants was ensured and declared safe. However, to eliminate grammatical and spelling error, the thesis was subjected to language editing and a certificate letter from a qualified English language editor (appendix G) was obtained.

4.13. Data analysis

Data gathered was coded, tabulated and analysed in line with the research questions (section 1.3.1) and hypotheses (section 3.3) using qualitative and quantitative data analysis.

4.13.1. Quantitative data analysis

Both the conventional/traditional analysis and Structural Equation Model (SEM) were used for data analyses. In the case of the former, Statistical Programme for Social Sciences (SPSS) software package version 21 was used for data computation and analysis but the graphical representation was by pie chart and histogram. The hypotheses were analysed with inferential statistics and the statistical tools employed include Chi square, exploratory factor analysis, Pearson correlations, linear regression and multiple regression analysis. Chi square test was adopted for hypothesis one because it has lesser mathematical details while Pearson correlation, linear regression and multiple regression analysis were used for hypotheses 2 to 11 because there were mathematically inclined.

The demography data and responses gathered via questionnaire were analysed using the frequency count distributions.

In SEM, the Analysis of Moment Structure (AMOS) software package version 26 was used. However, the following indices were used to measure the hypotheses: comparative fit index (CFI), root mean square error of approximation (RMSEA), Chi-square statistics (CMIN), normed fit index (NFI), relative fit index (RFI), Tucker Lewis index (TLI), incremental fit index (IFI), and the goodness of fit index (GFI).

4.13.2. Qualitative data analysis

The open-ended responses collected for this study are qualitative and non-numeric. Content analysis was thereby adopted for qualitative data analysis since "the trustworthiness of content analysis results depends on the availability of rich, appropriate, and well-saturated data" (Elo *et al.*, 2014:10). The four main stages (decontextualisation, recontextualisation, categorisation and compilation) were adopted to analyse qualitative data in this study.

At the first stage – decontexttualisation, the responses of the participants were carefully read and broken into smaller meanigful units of needed information or useful insight, with each segment being assigned a code. At the second stage – recontentualisation, the identified segments were compare with the original text to avoid leaving behinde some useful information. At the categorisation (third) stage however, the segments were classified to reduce the number of words without missing out the content of the units. The last stage - compilation stage handles the analysis and write up process. The appropriate units/quatations were choosen for the identified categories, and the results were tabulated for quick overview. This stage is also resposible for the validation of the results generated with previous literature. The data was compiled and analysed using ATLAS.ti version 8 and Microsoft Excel software packages.

4.14. Research Process Flowchart

As depicted in figure 8, this research process started with a comprehensive literature review where theories, concepts and previous works done on KM were studied to raise the research problems, identify research variables and formulate the eight hypotheses. Research paradigm adopted was pragmatism while research design embraced was mixed methods research design.

The research made use of convergent parallel mixed methods as a procedure for collecting, analysing, interpreting and reporting data. Both open ended and closed ended questionnaires were

administered concurrently but the qualitative and quantitative data were independently analysed to generate independent results. The results generated were interpreted and validated.

4.15. Summary

This chapter reviewed the research design and methodology employed in this study. The paradigm, study approaches, research population as well as the sampling and instrument adopted were discussed stating the rationale for their selection, reliability and validity.

The chapter also tackled the data analysis procedure and shed light on how data collected was processed. The research process and research framework were discussed and summarized diagrammatically with the aid of a flowchart in figure 8.

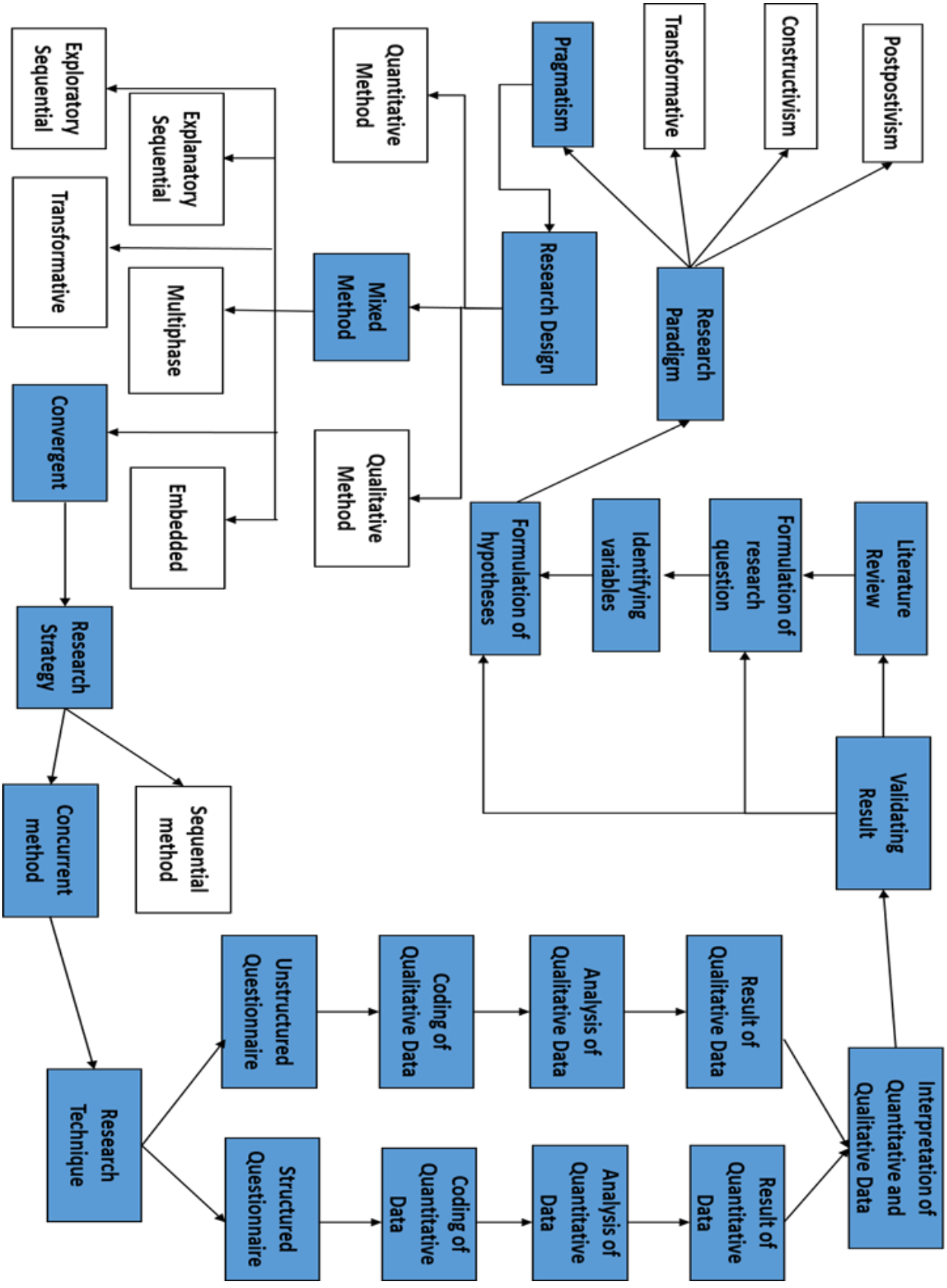

Figure 8 Research Process Flowchart (Own Compilation)

CHAPTER FIVE

Data Analysis and Results

5.1. Introduction

This chapter addresses the research objectives and employs the various methodology discussed in chapter three to perform the statistical analysis and answer the research questions and hypotheses. The quantitative and qualitative findings are presented as the raw data obtained and converted into meaningful information. Research data are descriptively analysed and the details of the basic features of the respondents' biographies are given. The chapter is grouped into four sections which consecutively present the respondents biography, the quantitative findings, the qualitative findings, and the brief summary of the chapter.

5.1.1. Demographic Profile of the Respondent

5.1.1.1. Gender and Marital Status

The summarised results on Table 6, depicted in figure 9 show that the male respondents are more than the female respondents.

Table 6: Gender of the respondent

		Frequency	Percentage
Gender	Male	250	55
	Female	206	45

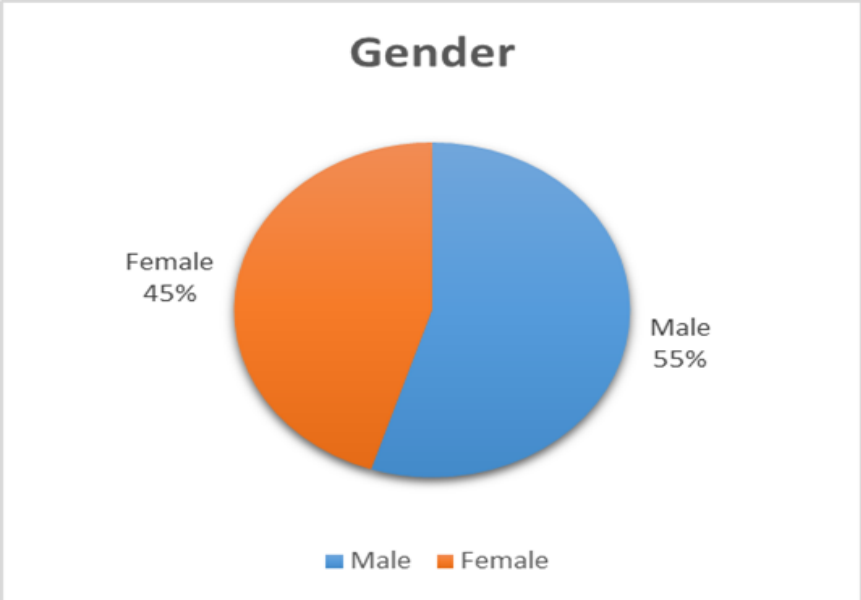

Figure 9: Gender of the respondents

The summarised results on Table 7, depicted in figure 10 show that the number of the single respondents is higher than the married/divorce respondents.

Table 7: Gender and Marital Status of the respondent

		Frequency	Percentage
Marital Status	Single	301	66
	Married/divorce	155	34

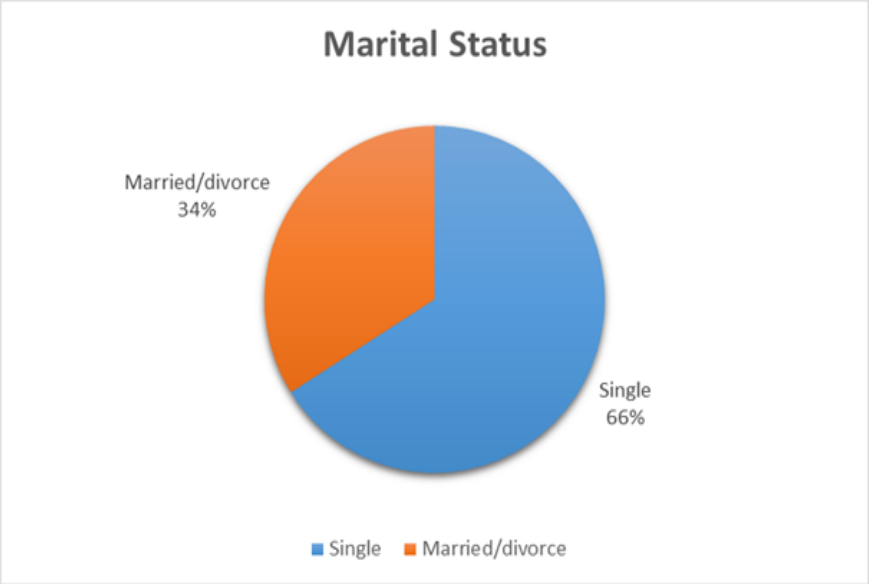

Figure 10: Marital Status of the respondents

5.1.1.2. Qualifications and Designation

The summarised results on Table 8, which is depicted in figure 11 show that Undergraduate has the highest percentage while PhD holder has the lowest just as student has the higher percentage above the academic staff.

Table 8: Academic Qualification and Designation of Respondents

		Frequency
Qualification	Undergraduate	288
	Bachelor's Degree	40
	Master's Degree	87
	PhD	41
Designation	Student	304
	Academic Staff	152

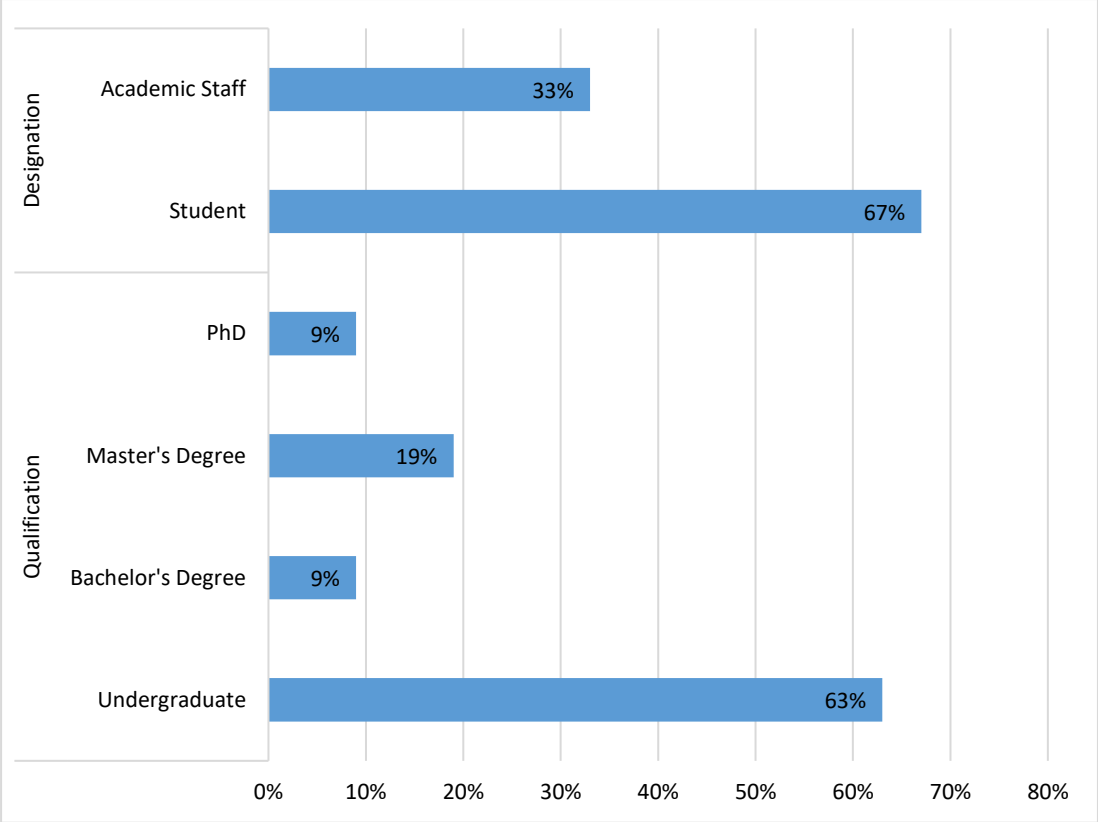

Figure 11: Academic Qualification and Designation of the Respondents

5.1.1.3. Institutions

Table 9 and figure 12 show the number of participants from each institution. Federal University of Agriculture, University of Ibadan, Tai Solarin University of Education and Olabisi Onabanjo University have the highest respondents of 50 participants each, while Babcock University and Crawford University have the lowest number of 36 each. Other universities fall in-between 36 and 50.

Table 9: Institutions Name and Ownership

University Category	University Name	Frequency
Private University	Babcock University	36
	Bell University	45
	Crawford University	36
	Augustine University	46
	Covenant University	44
Federal University	Fed. Uni of Agric. Abeokuta	50
	University of Ibadan	50
State University	Tai Solarin University of Education	50
	Lagos State University	49
	Olabisi Onabanjo University	50

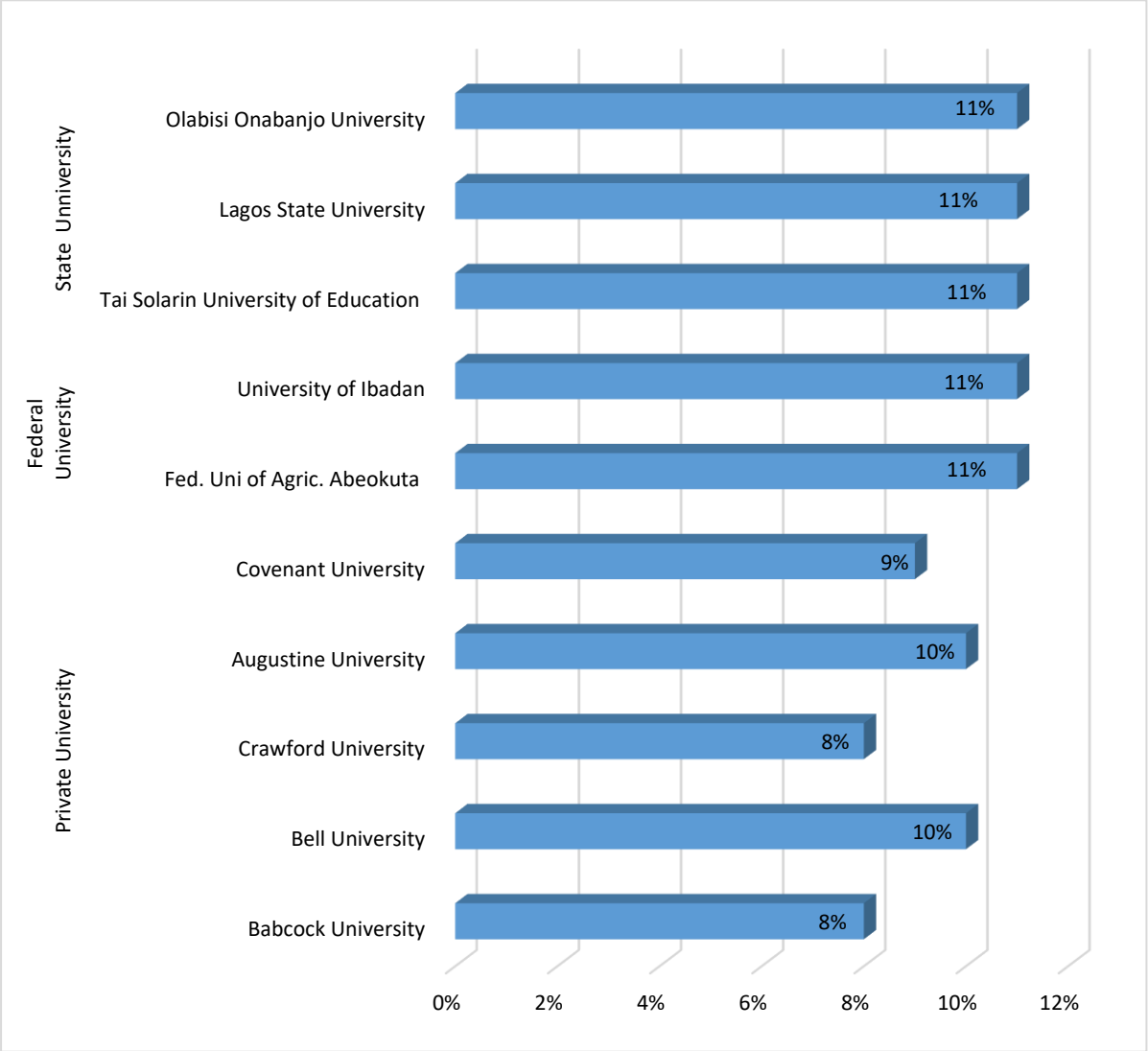

Figure 12 Institutions Name and Ownership

5.2. Quantitative Findings

The conversional statistical tools including reliability test, exploratory factor analysis, correlation analysis and multiple regression analysis were used to analyse the quantitative data generated via the questionnaire, while the confirmatory factor analysis and structural equation model were used to test the theoretical model fitness. The choice of these tools was guided by their simplicity, and the presentation of findings was guided by the research questions and hypotheses.

5.2.1. Reliability Analysis

The internal consistency and reliability of the items used were tested using Cronbach's alpha reliability test. An item with total correlation value below 0.5 is not acceptable (Hair, Black, Babin,

and Anderson, 2014) and such is not considered in testing the hypothesis. The results are presented on tables 10 to 15.

5.2.1.1. RQ1: Awareness Level

The Table 10 shows that one of the items (question 5) highlighted in red is unacceptable because it has a total correlation value of 0.252 which is less than acceptable Cronbach's alpha reliability test coefficient (0.7) (Hair *et al*., 2014). Therefore, item Q5 is deleted and the Cronbach Alpha if item Q5 deleted is 0.824 (which is greater than 0.7) thereby confirming the consistency, reliability and acceptability of the other four items used.

Table 10: Awareness Level Reliability Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1	10.69	3.464	.657	.643
Q2	10.70	3.707	.526	.689
Q3	10.70	3.436	.670	.638
Q4	10.71	3.594	.560	.676
Q5	11.30	3.696	.252	.824

Note: the deleted item is highlighted in red.

5.2.1.2. RQ2 and RQ3: Enabler Capability

Table 11 shows that the items measuring dependent variables (Enabler capability) are reliable, consistent and acceptable because the Cronbach's alpha reliability test coefficient for each variable is greater than 0.9 (Hair *et al.*, 2014).

Table 11: KM Enabler reliability test

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
LEQ1	58.54	28.420	.965	.996
LEQ2	58.53	28.905	.961	.996
LEQ3	58.52	28.844	.944	.996
LEQ4	58.52	29.041	.956	.996
PEQ1	58.52	29.055	.956	.996
PEQ2	58.54	28.460	.978	.996
PEQ3	58.52	28.733	.970	.996
PEQ4	58.54	28.478	.976	.996
TIQ1	58.54	28.455	.976	.996
TIQ2	58.52	29.046	.959	.996
TIQ3	58.52	28.690	.972	.996
TIQ4	58.52	28.791	.971	.996
OSQ1	58.52	28.808	.974	.996
OSQ2	58.53	28.610	.973	.996
OSQ3	58.53	28.557	.980	.996
OSQ4	58.53	28.680	.981	.996

5.2.1.3. RQ2 and RQ3: Strategy Capability

Similarly, the Cronbach's alpha reliability test coefficient for instrument measuring dependent variable strategy capability is greater than 0.9 as shown on Table 12 confirming the acceptability, reliability and consistency of the research instrument (Creswell, 2014).

Table 12: Strategy Capability Reliability Test

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
POQ1	30.65	12.461	.751	.957
POQ2	30.66	11.903	.852	.953
POQ3	30.60	12.478	.884	.952
PLQ1	30.66	11.896	.877	.951
PLQ2	30.65	12.461	.751	.957
PLQ3	30.66	11.903	.852	.953
FDQ1	30.60	12.478	.884	.952
FDQ2	30.66	11.896	.877	.951
FDQ3	30.64	12.550	.769	.957

5.2.1.4. RQ2 and RQ3: KM Process

Table 13 presents the Cronbach's alpha reliability test coefficient result on process capability. The item with the value less than 0.5 highlighted in red KRUQ1 is removed because its value is 0.285

which is less than acceptable Cronbach's alpha reliability test coefficient (Hair *et al.*, 2014). The Cronbach's alpha if item (KRUQ1) is deleted equals 0.930 (Table 13) therefore the instrument is acceptable, reliable and consistence for all other items used.

Table 13: Process Capability Reliability Test

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
KCPQ1	49.17	14.025	.626	.920
KCPQ2	46.09	13.959	.686	.919
KCPQ3	46.09	14.029	.671	.919
KCP	46.07	14.421	.589	.921
KSHQ1	49.17	14.025	.626	.920
KSHQ2	46.08	14.051	.688	.919
KSHQ3	46.10	13.869	.701	.918
KRUQ1	**49.15**	**15.041**	**.285**	**.930**
KRUQ2	46.10	13.897	.687	.918
KRUQ3	46.09	14.058	.678	.919
KSTQ1	49.17	14.018	.625	.920
KSTQ2	46.08	13.848	.744	.917
KSTQ3	46.08	13.906	.746	.917
KST	46.07	14.312	.659	.920
KSH	46.06	14.455	.603	.921
KRU	46.07	14.548	.536	.923

Note: the deleted item is highlighted in red.

5.2.1.5. RQ2 and RQ3: KM Success

Table 14 reflects the Cronbach's alpha reliability test coefficient result on KM success. The correlation value for KMS Q5 is -0.67 because it is lesser than the acceptable Cronbach's alpha reliability test coefficient of (0.7) (Hair *et al.*, 2014). The Cronbach's alpha if item (KMS Q5) is deleted equals 0.995 (Table 14). This implies that the research instrument is acceptable, reliable and valid.

Table 14: KM Success reliability test

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
KMSU Q1	15.56	1.152	.910	.713
KMSU Q2	15.56	1.148	.909	.713
KMSU Q3	15.56	1.202	.892	.725
KMSU Q4	15.56	1.120	.901	.710
KMSU Q5	15.67	1.819	-.067	.995

Note: the deleted item is highlighted in red.

5.2.1.6. RQ4: Academic Performance

Table 15 shows that the instrument used to measure independent variables is reliable, consistent and acceptable as the total correlation for each item is greater than 0.8 which is higher than the acceptable Cronbach's alpha reliability test coefficient (Creswell, 2014).

Table 15: Academic Performance Reliability Test

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
AP Increase research output	11.58	1.796	.853	.920
AP grounded graduate	11.55	2.063	.893	.911
AP Increase academic performance	11.56	1.983	.871	.913
AP Innovativeness	11.58	1.840	.822	.930

5.2.2. Factor Analysis

Factor analysis is a technique used to condense large number of variables into smaller number of factors. Factor analysis can either be exploratory or confirmatory. In this study, and for the reasons stated in the next two sections, exploratory factor analysis was adopted for factor loading for conversional analysis while confirmatory factor analysis was used for structural equation model analysis.

5.2.2.1. Exploratory Factor Analysis

Exploratory factor analysis was conducted on the questionnaire data to extract new variables as listed on Table 16 from the participants' response. The exploratory factor analysis was adopted because of its ability to summarise variables information and generate new factors without losing much information (Hair et al., 2014). Initial un-rotated factor matrix was used to determine the number of factors to be extracted which was a function of latent root criterion (eigenvalues) and the percentage of eigenvalues. Factor loadings ranges of ±.30 to ±.40 are normally considered less significant while factor loadings with ±.50 or greater are considered practically significant. Since there are no statistical guidelines to give accurate value for large and small communality value (Hair et al., 2014), this study only considers the principal component factor analysis significant for commonalities when the value is greater than 0.40 and 0.50 for factor loading.

5.2.2.2. Confirmatory Factor Analysis (CFA)

Confirmatory factor analysis was conducted on the questionnaire data to measure the theoretical models. According to Prudon (2015), confirmatory factor analysis is a sophisticated statistical tool used to test the complex theoretical models, and is adopted in this study because of its potent and flexibility to model the relationship between the observed indicators and causal factors (Gallagher and Brown, 2013). It makes use of structural equation model for its execution (Prudon, 2015) as shown in Tables 38 - 40. The following statistical tools, namely comparative fit index (CFI), root mean square error of approximation (RMSEA), Chi-square statistics (CMIN), normed fit index (NFI), relative fit index (RFI), Tucker Lewis index (TLI), Akaike's information criterion (AIC), Bayelsian information criterion (BIC) and the standardized root mean square residual (SRMSR) were used to predict the CFA.

5.2.2.3. Factors' Description

Table 16 contains the conceptual name of the factor loading products extracted from the second and third factor analysis. Appendix F presented the corresponding questions to each conceptual name in the survey instrument.

Table 16: Conceptual Name

Factor	Conceptual Name	Code
1	Leadership	LE
2	People	PE
3	Technology Infrastructure	TI
4	Organisational Process	OP
5	Enabler Capability	EC
6	Knowledge Capture	KCP
7	Knowledge Sharing	KSH
8	Knowledge Reuse	KRU
9	Knowledge Storing	KST
10	Process Capability	PC
11	Policy	PO
12	Planning	PL
13	Funding	FD
14	Strategy Capability	SC
15	KM Success	KMSU
16	Academic Performance	AP

Table 17 described the 16 factors generated from factor analysis, as well as their communalities and factor loading. Cut off point of 0.5 was used for factor loading while 0.4 was used for communality (Hair *et al.*, 2014). Hence, any number below the cut of point is eliminated and considered inappropriate for the conceptual name in this study.

The items for factor 1-5, 7-11 and 13 are considered appropriate because both the communality and factor loading are greater than the slated cut off point while some items in factor 6, 9 and 15 are considered unsuitable as shown in table 17. For factor 6, item no. 56 (item in red) is removed as both the communality and factor loading are lesser than the slated cut off point while items 55, 57 and 58 are considered fit for the conceptual name. Similarly, items 73, 74, 75, and 76 are considered fit for the conceptual name but item 70 (item in red) is not and therefore removed for lack of low communality and factor loading score. Item no. 77 (item in red) is also removed from factor 15 as both the communality and factor loading are below the slated cut off point.

Table 17: Product of Factor Loading

Factor	Name	Item no.	Communality	Factor loading
1	Leadership	20	0.955	0.977
		21	0.962	0.981
		22	0.931	0.965
		23	0.954	0.977
2	People	26	0.953	0.976
		27	0.977	0.989
		28	0.966	0.983
		29	0.953	0.976
3	Technology Infrastructure	32	0.933	0.966
		33	0.968	0.984
		34	0.984	0.992
		35	0.973	0.986
4	Organisational Process	38	0.965	0.982
		39	0.974	0.987
		40	0.982	0.991
		41	0.981	0.99
5	Enabler Capability	Leadership	0.973	0.986
		People	0.985	0.993
		Technology Infrastructure	0.982	0.991
		Organisational Process	0.984	0.992
6	Knowledge Capture	55	0.88	0.938
		56	0.028	0.168
		57	0.946	0.973

		58	0.953	0.976
7	Knowledge Sharing	59	0.819	0.905
		60	0.438	0.662
		61	0.906	0.952
		62	0.894	0.946
8	Knowledge Storing	63	0.831	0.912
		64	0.578	0.76
		65	0.819	0.905
		66	0.906	0.952
9	Knowledge Reuse	67	0.661	0.813
		68	0.857	0.926
		69	0.891	0.944
		70	0.358	0.598
10	Process Capability	Knowledge Capture	0.982	0.866
		Knowledge Sharing	0.816	0.727
		Knowledge Storing	0.821	0.713
		Knowledge Reuse	0.981	0.901
11	Policy	44	0.673	0.82
		45	0.754	0.868
		46	0.878	0.937
12	Planning	47	0.897	0.947
		48	0.671	0.819
		49	0.76	0.875
13	Funding	50	0.893	0.945
		51	0.741	0.861
		52	0.779	0.883
14	Strategy Capability	Policy	0.983	0.991
		Planning	0.956	0.978
		Funding	0.963	0.981
15	KM Success	73	0.991	0.995
		74	0.991	0.995
		75	0.974	0.987
		76	0.985	0.992
		77	0.008	-0.089
16	Academic Performance	80	0.992	0.996
		81	0.991	0.996
		82	0.974	0.987
		83	0.985	0.993

5.2.2.4. Reliability and validity of factor loading

The Cronbach's alpha reliability test coefficient is greater than 0.6 for each variable, the factor loadings for all constructs is greater than 0.5, and the percentage variance is greater than 60%. Any value of KMO below 0.5 is unacceptable (Hair *et al.*, 2014). Fortunately, no KMO value on Table

18 fails this test. Similarly, Bartlett's test of sphericity and Cronbach's alpha put the reliability of the instrument at alpha = 0.001 and alpha greater at 0.6. All these statistics confirm that the instrument measuring both dependent and independent variables is valid, and the factors extracted to measure the variables are reliable, consistent and acceptable (Hair *et al.*, 2014).

Table 18: Validity Test

Conceptual Name	**Cronbach's alpha**	**Factor Loading**	**No. of Items**	**KMO**	**Bartlett's test of Sphericity**	**% of Variance**
Awareness Level	.643	.877 .676 .876 .802	4	0.783	0.001	65.931
Leadership (LE)	.981	.977 .981 .965 .977	4	0.885	0.001	95.026
People (PE)	.986	.976 .989 .983 .976	4	0.819	0.001	96.224
Technology Infrastructure (TI)	.987	.966 .984 .982 .986	4	0.822	0.001	96.451
Organisational Process (OP)	.991	.982 .987 .991 .990	4	0.723	0.001	97.545
Knowledge Capture (KCP)	.643	.943 .972 .977	3	0.747	0.001	92.989
Knowledge Sharing (KSH)	.885	.905 .662 .952 .946	4	0.741	0.001	76.424
Knowledge Reuse (KRU)	.887	.813 .926 .944	3	0.668	0.001	80.322
Knowledge Storing (KST)	.901	.912 .760 .905 .952	4	0.751	0.001	78.353
Policy (PO)	.838	.820 .868 .937	3	0.646	0.001	76.820
Planning (PL)	.856	.947 .819 .875	3	0.619	0.001	77.829
Funding (FD)	.870	.945 .861 .883	3	0.670	0.001	80.425
KM Success (KMSU)	.995	.996 .996 .987 .993	4	0.825	0.001	98.562
Process capability (PC)	.817	.866 .727 .713 .901	4	0.590	0.001	64.952
Enabler Capability (EC)	.994	.986 .993 .991 .992	4	0.813	0.001	98.099
Strategy Capability (SC)	.983	.991 .978 .981	3	0.741	0.001	96.726
Academic Performance (AP)	.995	.996 .996 .987 .993	4	0.825	0.001	98.562

5.2.3. Conversional Analysis: Hypotheses Test

Linear regression, multiple regression, Chi square and Pearson correlations are statistical tools adopted for research hypotheses analysis. The correlation coefficient (R) is used to establish the linear relationship between the variables at threshold of 5% significant ($p < 0.05$). Similarly, the predictor coefficient β value helped to predict the effect of independent variables on dependent variable following the under listed rules:

Rule 1 Accept null hypothesis if p value is more than 0.05 ($p<0.05$).

Rule 2 Accept alternate hypothesis if p value is below 0.05 ($p<0.05$).

Rule 3 Weak relationship is indicated by $0.00<R<0.33$.

Rule 4 Moderate relationship is indicated by $0.34<R<0.66$.

Rule 5 Strong relationship is indicated by $0.67<R<1.0$.

Rule 6 Positive relationship is indicated by + sign.

Rule 7 Negative relationship is indicated by – sign.

5.2.3.1. Test on RQ1

To answer RQ1, one hypothesis and two sub hypotheses were raised as follows:

Hypothesis 1 The awareness level of KM is high in Nigerian South West tertiary institutions.

Hypothesis 1A There is a linear relationship between KM awareness level, KM familiarity and KM current status in south west Nigerian tertiary institutions.

Hypothesis 1B There is a significant difference in awareness level among the academic status in south west Nigerian tertiary institutions.

Hypothesis 1

One-sample chi square test was adopted and considered appropriate for hypothesis1 because it is a single variable (Pallant, 2013). The derived observed and expected count for variable examined is displayed on Table 19, with expected N = 114. A total number of 292 respondents agreed that awareness level of KM in tertiary institutions is high as the test statistics value was at 428.561[a] and p value was 0.001 (Table 20). Hence, the KM awareness level in Southwest tertiary institution is high.

Table 19: Awareness Level

	Observed N	Expected N	Residual
None	2	114.0	-112.0
Low	116	114.0	2.0
High	292	114.0	178.0
Very high	46	114.0	-68.0
Total	456		

Table 20: Awareness Level Test Statistics

	Chi-square	**df**	**Asymp. Sig**
Awareness level	428.561[a]	3	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 114.0.

Hypothesis 1A

Pearson correlation and multiple linear regression were adopted to determine the linear relationship amongst the KM awareness level, KM familiarity and KM current status as presented on Tables 22, 23 and 24 respectively. A moderate relationship is observed in-between these variables with a correlation coefficient range (r) of $0.59 < |r| < 0.72$ as shown in Table 21.

Table 21: Correlation Matrix Awareness, Current Status and KM Familiarity Level

		KM Awareness Level	KM Current Status	KM Familiarity
KM Awareness Level	Pearson Correlation	1	0.726**	0.596**
	Sig. (2-tailed)		0.000	0.000
KM Current Status	Pearson Correlation	0.726**	1	0.617**
	Sig. (2-tailed)	0.000		0.000
KM Familiarity	Pearson Correlation	0.596**	0.617**	1
	Sig. (2-tailed)	0.000	0.000	

**. Correlation is significant at the 0.01 level (2-tailed).
b. Listwise N=456

From the Tables 22 - 24, the significant regression equation = F (2,453) = 312.134, p =0.001 (table 23) with r = .761 and R^2 = .579 (table 22). Similarly, the predictor coefficient β value equals .556 with t = 14.614 at p = .001 and, β value equals .279 with t = 7.561 at p = .001 as shown on Table 24 indicate that both the KM awareness level and familiarity have positive effect on the KM current status. Hence, alternate hypothesis is accepted that there is a linear relationship between KM awareness level, current status and familiarity.

Table 22: Current Status Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.761[a]	.579	.578	.384

a. Predictors: (Constant), KM awareness level, KM familiarity

Table 23: Current Status ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	91.914	2	45.957	312.134	.000[b]
	Residual	66.698	453	.147		
	Total	158.612	455			

a. Dependent Variable: Current status
b. Predictors: (Constant), KM awareness level, KM familiarity

Table 24 Current Status Coefficients[a]

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.461	.097		4.764	.000
	KM awareness level	.556	.038	.555	14.614	.000
	KM familiarity	.279	.037	.287	7.561	.000

a. Dependent Variable: Current status

Hypothesis 1B

Pearson chi square was adopted to test for a possible difference in awareness level amongst the academic status (student and academic staff), and the result is presented on Table 25. Observing the first row, it is seen that the p value is 0.001 which is less than 0.05 ($x^2(3) = 28.575$, $p<0.001$). Thus, the alternate hypothesis is accepted and null hypothesis is rejected, implying that there is a significant difference in the KM awareness level between the academic staff and the student. The result agreed with the findings of Anvari *et al.* (2011) that there was a significant difference in the perception and experience of KM among the university community.

Table 25: H1B Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	28.575[a]	3	.000
Likelihood Ratio	30.359	3	.000
Linear-by-Linear Association	28.499	1	.000
N of Valid Cases	456		

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is .67.

5.2.3.2. Test on RQ2

Linear regression analysis was adopted in this section to analyse RQ2 towards examining the impacts of the following factors to a successful KM implementation: Enabler capability, strategy capability and process capability variables.

Process Capability

Tables 26 and 27 contain the result of the four hypotheses raised to examine the four variables (capture, sharing, storing and reuse) identified for Process capability.

Hypothesis2A Process Capability (Knowledge Capture) influences KM success positively

Hypothesis2B Process Capability (Knowledge Sharing) influences KM success positively

Hypothesis2C Process Capability (Knowledge Storing) influences KM success positively

Hypothesis2D Process Capability (Knowledge Reuse) influences KM success positively

The result on Table 26 shows the correlation coefficient (r) range at $.37< |r| < .96$ and $p <0.001$, indicating a moderate significant relationship among the variables (process capability and KM success).

Table 26: Correlation Matrix for Process Capability and KM Success

		Knowledge-Capture	Knowledge-Sharing	Knowledge-Storing	Knowledge - Reuse	KM Success
Knowledge-Capture	Pearson Correlation	1	.426**	.378**	.963**	.534**
	Sig. (2-tailed)		.000	.000	.000	.000
Knowledge-Sharing	Pearson Correlation	.426**	1	.653**	.495**	.426**
	Sig. (2-tailed)	.000		.000	.000	.000
Knowledge-Storing	Pearson Correlation	.378**	.653**	1	.404**	.408**
	Sig. (2-tailed)	.000	.000		.000	.000
Knowledge – Reuse	Pearson Correlation	.963**	.495**	.404**	1	.540**
	Sig. (2-tailed)	.000	.000	.000		.000
KM Success	Pearson Correlation	.534**	.426**	.408**	.540**	1
	Sig. (2-tailed)	.000	.000	.000	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

b. Listwise N=445

Table 27: Result of Linear Regression Between Process capability and KM Success

Hypothesis	**VARIABLE**	**r**	**R^2**	**F**	**SIG (F)**	**B**	**t**	**SIG (t)**
Hypothesis 2A	KCP	0.534	0.285	176.626	0.001	0.534	13.290	0.001
Hypothesis 2B	KSH	0.540	0.291	181.959	0.001	0.540	13.489	0.001
Hypothesis 2C	KST	0.408	0.166	88.449	0.001	0.408	9.405	0.001
Hypothesis 2D	KRU	0.426	0.182	98.414	0.001	0.426	9.923	0.001

Hypothesis 2A

The regression Table 27 reveals significant regression equation for the variable knowledge capture as $F = 176.626$, $p < .001$ and 444 degree of freedom with $r = .534$ and $R^2 = .285$. The result denotes an existence of a positive linear relationship between the variables. Also, this table presents Beta (β) weights (predictor coefficient) as 0.534 and t as 13.290 at $p <0.001$ implying that knowledge capture (independent variable) has an influence on KM success (dependent variable). Hence,

alternate hypothesis is accepted and null hypothesis is rejected that there exists a positive contribution of knowledge capture to KM implementation success in TI.

Hypothesis 2B

The results of linear regression showing the contribution of knowledge sharing are presented on Table 27 where a significant regression equation was discovered at F equals 181.959, $p < .001$ and 444 degree of freedom with r equals to .540. and $R^2 = .291$. The results indicated that knowledge sharing and KM success have positive linear relationship. Similarly, β value (predictor coefficient) equal to .540 with $t = 13.489$ at $p = .001<.05$ confirms that independent variable - knowledge sharing, has an influence on the KM success (dependent variable). Therefore, the alternate hypothesis is accepted while the null hypothesis is rejected, also establishing the contribution of knowledge sharing in a successful KM implementation at the Nigerian tertiary institutions.

Hypothesis 2C

The regression Table 27 reveals the significant regression equation for knowledge storing as ($F (1, 443) = 88.449$, $p < .001$) with r equal to .408 and R^2 equal to .166. The result shows an existence of a positive linear relationship between the variables. Also, β value (predictor coefficient) as 0.408 and t as 9.405 at $p <0.001$ suggests that knowledge storing (independent variable) has an influence on KM success (dependent variable). Hence, alternate hypothesis is accepted while null hypothesis is rejected, confirming the positive contribution of knowledge storing in the successful KM implementation in TI.

Hypothesis 2D

The results of linear regression showing the contribution of knowledge reuse are shown in Table 27. The significant regression equation as depicted on Table 27 revealed F as 98.414, $p < .001$ and 444 degree of freedom with r equals .426 and R^2 equal .182 indicating that knowledge reuse and KM success have a positive linear relationship. Similarly, β value (predictor coefficient) of .426 with $t = 9.923$ at $p = .001<.05$ is a confirmation that independent variable (knowledge reuse) has an influence on the KM success (dependent variable). Therefore, the alternate hypothesis is accepted while the null hypothesis is rejected, establishing the contribution of knowledge reuse in a successful implementation of KM at the tertiary institutions.

Enabler Capability

Four variables (leadership, people, technology infrastructure and organisational process) were considered to examine enabler capability. The following four hypotheses were however raised and result presented on Tables 28 and 29.

Hypothesis 3A Enabler Capability (Leadership) influences KM success positively

Hypothesis 3B Enabler Capability (People) influences KM success positively

Hypothesis 3C Enabler Capability (Technology Infrastructure) influences KM success positively

Hypothesis 3D Enabler Capability (Organisational Process) influences KM success positively

Table 28: Enabler Capability Correlation[b]

		LE	PE	TI	OP	KMSU
LE	Pearson Correlation	1	.981**	.961**	.966**	.912**
	Sig. (2-tailed)		.000	.000	.000	.000
PE	Pearson Correlation	.981**	1	.976**	.975**	.902**
	Sig. (2-tailed)	.000		.000	.000	.000
TI	Pearson Correlation	.961**	.976**	1	.989**	.916**
	Sig. (2-tailed)	.000	.000		.000	.000
OP	Pearson Correlation	.966**	.975**	.989**	1	.914**
	Sig. (2-tailed)	.000	.000	.000		.000
KMSU	Pearson Correlation	.912**	.902**	.916**	.914**	1
	Sig. (2-tailed)	.000	.000	.000	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

b. Listwise N=445

Table 28 shows a strong relationship between the enabler capability (leadership (LE), people (PE), technology infrastructure (TI) and organisational process (OP)) and KM success (KMSU) at R value (correlation coefficient) of $.90 < |r| < .98$ and $p < 0.001$.

Hypothesis 3A

Linear regression was used to examine the contribution of leadership towards KM success. The result as shown on Table 29 indicates a strong correlation at r = .912 and R2 = .832. Also the Table 29 reflects changes in item information score with regression equation of ($F(1, 433) = 2201.757$, $p = .001$) which shows that leadership and KM success have a strong linear relationship. The predictor coefficient β value = .902 with t = 44.233 at p = .001 also suggests that leadership (independent variable) has a high influence on KM success (dependent variable). Thus, the alternate hypothesis is accepted while null hypothesis is rejected suggesting the positive influence of leadership on KM

success in the institutions. This agrees with the submission of Agarwal and Marouf (2014) and Sayyadi (2019) that supports from the principal officers is a motivation to KM success.

Table 29: Result of Linear Regression Between Enabler Capability and KM Success

Hypothesis	VARIABLE	r	R^2	F	SIG (F)	B	T	SIG (t)
H3A	LE	0.912	0.832	2201.757	0.001	0.902	44.233	0.001
H3B	PE	0.903	0.815	1956.597	0.001	0.893	48.107	0.001
H3C	TI	0.916	0.839	2314.328	0.001	0.906	46.923	0.001
H3D	OP	0.914	0.836	2257.711	0.001	0.904	47.515	0.001

Hypothesis 3B

The result of linear regression to show the contribution of people is presented on Table 29 confirming that people and KM success have a strong relationship with correlation coefficient (r) range at .903 and R^2 at .815. Information about the changes in item scores are presented where a significant regression equation was discovered at F as 1956.576, $p < .001$ and 444 degree of freedom confirming that people and KM success are in a positive linear relationship. Similarly, the β value (predictor coefficient) equals .893 with $t = 48.107$ at $p = .001<.05$ suggests that independent variable (people) has a high impact on the KM success (dependent variable). Hence, the alternate hypothesis is accepted while the null hypothesis is rejected to establish the contribution of people in KM implementation success at the tertiary institutions. This result is in line with Kamaruzzaman *et al.* (2016) findings which regarded people as a strong stakeholder in achieving KM effectiveness.

Hypothesis 3C

Linear regression was used to examine the contribution of technology infrastructure towards KM success. The result as shown on Table 29 indicated a strong correlation relationship at $r = .916$ and $R^2 = .839$. Also Table 29 reflects changes in item information score with the regression equation of F equals 2314.329, $p < .001$ and 444 degree of freedom which show that technology infrastructure and KM success have a strong linear relationship. Similarly, the predictor coefficient β value = .906 with $t = 46.923$ at $p = .001$ suggests that technology infrastructure (independent variable) has a high influence on KM success (dependent variable). Hence, the alternate hypothesis is accepted and the null hypothesis is rejected thereby confirming the contribution of technology infrastructure to a successful implementation of KM at the tertiary institutions. The result is in agreement with Ainissyifa (2012) and Kaldeen, Nawaz and Hassan (2020) findings that technology infrastructure is an important element of an effective KM.

Hypothesis 3D

The linear regression results for contribution of organisational process in achieving KM success are also presented on Table 29. These results confirmed that organisational process and KM success have a strong relationship with correlation coefficient (r) range at .914 and R^2 at .836. The regression Tables 29 discloses information about the changes in item scores where the regression equation was revealed at F = 98.414, p < .001 and 452 degree of freedom indicating that organisational process and KM success has a positive linear relationship. Similarly, the β value (predictor coefficient) equals.904 with t = 47.515 at p = .001<.05 shows that independent variable (organisational process) has a high impact on the KM success (dependent variable). Hence, the alternate hypothesis is accepted and the null hypothesis is rejected to establish the contribution of organisational process in successful implementation of KM in tertiary institutions.

Strategy Capability

Three variables are also considered to examine strategy capability (policy, planning and funding). The following three hypotheses were raised and result presented on Tables 30 and 31.

Hypothesis 4A Strategy Capability (Policy) influences KM success positively

Hypothesis 4B Strategy Capability (Planning) influences KM success positively

Hypothesis 4C Strategy Capability (Funding) influences KM success positively

Table 30: Correlation Matrix for Strategy Capability and KM Success

		KM Success	Policy	Planning	Fund
KM Success	Pearson Correlation	1	.833**	.848**	.821**
	Sig. (2-tailed)		.000	.000	.000
Policy	Pearson Correlation	.833**	1	.987**	.979**
	Sig. (2-tailed)	.000		.000	.000
Planning	Pearson Correlation	.848**	.987**	1	.962**
	Sig. (2-tailed)	.000	.000		.000
Fund	Pearson Correlation	.821**	.979**	.962**	1
	Sig. (2-tailed)	.000	.000	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

b. Listwise N=445

Tables 30 denotes a strong relationship between the strategy capability (planning, policy and funding) and KM success at correlation coefficient (r) range.82< |r| < .97 and p <0.001.

Hypothesis 4A

The results of linear regression showing information about the changes in item scores confirm the

relevance of policy is presented on Table 31. The regression equation was discovered at F = 1006.394, p < .001 and 444 degree of freedom. Also, R^2 equals .694 and r equal to .833, indicating that policy and KM success have positive linear relationship. Similarly, β value (predictor coefficient) equal.824 with t = 31.724 at p = .001<.05 suggests that independent variable policy has influence on KM success (dependent variable). Therefore, the alternate hypothesis is accepted and the null hypothesis is rejected to establish the contribution of policy to successful KM implementation in the institutions.

Hypothesis 4B

Linear regression was used to examine the contribution of planning towards KM success. The results presented on Table 31 indicate a strong correlation between planning and KM success at r = .848 and R2 = .719, showing changes in item information score with F =1132.926, p < .001 and 434 degree of freedom to ascertain a significant relationship between planning and successful KM implementation in the institutions. The β value (predictor coefficient = .824 with t = 31.724 at p = .001 also suggests that planning (independent variable) has a positive influence on KM success (dependent variable). Thus, the alternate hypothesis is accepted while the null hypothesis rejected, assenting the contribution of planning to successful KM.

Hypothesis 4C

The linear regression results for contribution of fund to KM success are also presented on the same Table 31 where the correlation coefficient (r) range at .821 and R^2 at .673 is a clear indication of a relationship between fund and KM success. The details about the changes in item scores was discovered at F = 912.966, p < .001 and 444 degree of freedom which suggests that their relationship is positive linear. The β value (predictor coefficient) equal to .811 with t = 32.215 at p = .001<.05 also shows that independent variable (fund) has an impact on the KM success (dependent variable). Hence, the alternate hypothesis is accepted while the null hypothesis is rejected, thereby establishing the contribution of fund to KM success in the institutions.

Table 31: Result of Linear Regression Between Strategy Capability and KM Success

Hypothesis	**VARIABLE**	**r**	**R^2**	**F**	**SIG (F)**	**B**	**t**	**SIG (t)**
Hypothesis 4A	PO	0.833	0.694	1006.394	0.001	0.824	31.724	0.001
Hypothesis 4B	PL	0.848	0.719	1132.926	0.001	0.839	33.659	0.001
Hypothesis 4C	FD	0.821	0.673	912.966	0.001	0.811	32.215	0.001

5.2.3.3. Test on RQ3

This research question examines the influence of proposed KM measuring metric (KM capabilities - process capability (PC), enabler capability (EC) and strategy capability (SC)) on effectiveness of KM practice in the institutions. The question adopted multiple regression and Pearson correlation analysis in analysing the hypotheses, and the result is presented on Tables 32 and 33. The following three hypotheses are raised:

Hypothesis 2: Process Capability (PC) has a linear relationship with KM success.
Hypothesis 3: Enabler Capability (EC) has a linear relationship with KM success.
Hypothesis 4: Strategy Capability (SC) has a linear relationship with KM success.

Tables 32 show a moderate relationship between KM capabilities (PC, EC, SC) and KM success at correlation coefficient (r) range.46< |r| < .92 and p <0.001.

Table 32 Result of correlation Analysis on KM Capabilities and KM Success

		KM Success	Process Capability	Strategy Capability	Enabler Capability
KM Success	Pearson Correlation	1	.598**	.841**	.920**
	Sig. (2-tailed)		.000	.000	.000
Process Capability	Pearson Correlation	.598**	1	.463**	.546**
	Sig. (2-tailed)	.000		.000	.000
Strategy Capability	Pearson Correlation	.841**	.463**	1	.825**
	Sig. (2-tailed)	.000	.000		.000
Enabler Capability	Pearson Correlation	.920**	.546**	.825**	1
	Sig. (2-tailed)	.000	.000	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

b. Listwise N=445

Hypothesis 2

The results on Table 33 show that Process capability has a strong relationship with KM success where correlation coefficient is at r equals .938 and R^2 = .879. It also shows changes in item information score with regression equation as (F (1, 433) = 1069.065, p = .001) implying that process capability and KM success actually have a positive linear relationship. Similarly, the predictor coefficient β value = .133 with t = 6.704 at p = .001 is an indication that process capability (independent variable) has an influence on KM success (dependent variable). The alternate hypothesis is therefore accepted and null hypothesis is rejected to establish the contribution of process capability to a successful KM practice.

Hypothesis 3

Enabler capability has a strong relationship with KM success where correlation coefficient is at r equals .938 and R^2 = .879 (Table 33). Similarly, information about the changes in item scores where regression equation discovered F to be 1069.065, p < .001 and 434 degree of freedom showing that enabler capability and KM success is in a positive linear relationship. Again, β value (predictor coefficient) equal .640 with t = 20.653 at p = .001<.05 is an indication that independent variable (enable capability) has an impact on the KM success (dependent variable). Hence, the alternate hypothesis is accepted while the null hypothesis rejected affirming that enabler capability contributes significantly to KM implementation success in tertiary institutions. This is in line with Kumaravel and Vikkraman (2018) where enabler is considered as a crucial success element of KM implementation in tertiary institutions.

Hypothesis 4

The findings on Table 33 are of correlation coefficient (r) equals .938 and R^2 equals .879 which is an indication of a strong relationship between strategy capability and KM success. Similarly, the regression equation revealed F as 1069.065, p < .001 and 434 degree of freedom (Table 33) indicating that strategy capability is significantly related to KM success. The β value (predictor coefficient) equal .824 with t = 31.724 at p = .001<.05 is also another indication that independent variable strategy capability has an influence over KM success (dependent variable). Hence, the alternate hypothesis is accepted while the null hypothesis is rejected to establish the contribution of strategy capability to KM implementation success in tertiary institutions, and validate the findings of Attallah, Athab and Abed (2015) that strategy capability is a key factor to KM effectiveness.

Table 33: Result of Multiple Regression Analysis on KMC and KMS

Variable	**r**	**R2**	**F**	**Sig (f)**	**B**	**T**	**Sig (t)**
EC	0.938	0.879	1069.065	0.001	0.640	20.653	0.001
PC					0.133	6.704	0.001
SC					0.251	8.554	0.001

5.2.3.4. Test on RQ4

This research question observed the influence of KM Capabilities on academic performance in tertiary institutions where process capability (PC), enabler capability (EC) and strategy capability (SC) on academic performance (AP) were the factors investigated. The question was analysed using Pearson correlation and multiple regression analysis, and the results are as presented on Tables 34 - 37. Similarly, the research question examines the impact of KM success on academic performance

using performance increase, increased research output, grounded graduates and innovativeness as a key performance indicator.

- ***KM Capabilities and AP: The following three hypotheses were examined.***

Hypothesis 5: Process Capability (knowledge sharing, knowledge capture, knowledge reuse and knowledge storing) has significant relationship with academic performance.

Hypothesis 6: Enabler Capability (leadership, people, technology infrastructure and organisational process) has a significant relationship with academic performance.

Hypothesis 7: Strategy Capability (policy, plan and fund) has a significant relationship with academic performance.

Results on Table 34 indicate an existence of KM capabilities (PC, EC and SC) is significantly related to academic performance at r (correlation coefficient) range of $.46 < |r| < .92$ and $p < 0.001$. This is in conformity with the findings of Matin (2015) that there is a significant relationship between KM capabilities and organisational performance.

Table 34: Correlations[b] among KM Capabilities and Academic Performance

		SC	EC	PC	AP
SC	Pearson Correlation	1	.822**	.463**	.840**
	Sig. (2-tailed)		.000	.000	.000
EC	Pearson Correlation	.822**	1	.546**	.920**
	Sig. (2-tailed)	.000		.000	.000
PC	Pearson Correlation	.463**	.546**	1	.598**
	Sig. (2-tailed)	.000	.000		.000
AP	Pearson Correlation	.840**	.920**	.598**	1
	Sig. (2-tailed)	.000	.000	.000	

**. Correlation is significant at the 0.01 level (2-tailed).
b. Listwise N=445

Hypothesis 5

To further confirm the result from correlation analysis conducted, multiple regression analysis was used to determine if KM process capability is significantly related to academic performance. The result on Tables 35 where the correlation coefficient (r) = .938 and R^2 = .881 is a clear indication that there is a strong relationship between the process capability and academic performance.

Similarly, Table 35 depicts a significant regression equation ($F(3, 441) = 1083.276$, $p < .001$) which represents a statistical linear relationship between process capability and academic performance.

The β value (predictor coefficient) equal.131 with t = 6.677 at p = .001<.05 shows that PC has a positive influence on academic performance. Hence, the alternate hypothesis is accepted while the null is hypothesis rejected confirming that process capability is statistically significant to academic performance just as earlier postulated by Zwain, Teong and Othman (2012).

Hypothesis 6

Multiple regression analysis was adopted to further confirm the results from correlation analysis conducted to determine if enabler capability has a significant relationship with academic performance. The results presented on Table 35 where correlation coefficient (r) = .938 and R^2 = .881 show a strong relationship between enabler capability and academic performance.

Same Table 35 also represents a significant regression equation (F (3, 441) = 1083.276, p < .001), which indicates a statistical linear relationship between the enabler capability and academic performance. The β value (predictor coefficient) equals.634 with t = 20.986 at p = .001<.05 also indicates that independent variable enabler capability has an influence over academic performance (dependent variable). Alternate hypothesis is therefore accepted and null hypotheses rejected confirming that enabler capability has a significant relationship with academic performance.

Hypothesis 7

Multiple regression analysis was employed in this hypothesis to determine if strategy capability has a significant relationship with academic performance. As presented on Table 35, the correlation coefficient (r) = .938 and R^2 = .881 implies that there is a strong relationship between the strategy capability and academic performance.

Table 35 also depicts the significant regression equation (F (3, 441) = 382.628, p < .001), that stands for a statistical linear relationship between strategy capability and academic performance. Similarly, the predictor coefficient (β value) equals .249 with t = 8.710 at p = .001<.05 indicate that strategy capability has a positive influence over academic performance. Hence, alternate hypothesis is accepted and null hypothesis is rejected implying that strategy capability has a significant relationship with academic performance just as in Al-Hakim and Hassan (2013).

Table 35: Result of Multiple Regression Analysis on KMC and AP

Variable	**R**	**R2**	**F**	**Sig (f)**	**B**	**t**	**Sig (t)**
PC	0.938	0.881	1083.276	0.001	0.131	6.677	0.001
EC					0.634	20.986	0.001
SC					0.249	8.710	0.001

- ***KM Success (KMSU) and Academic Performance Key Indicators (APKI): The following four hypotheses were formulated:***

Hypothesis 8: KM success has a positive influence on APKI - Increased Research Output (IRO).

Hypothesis 9: KM success has a positive influence on APKI - Grounded Graduate (GG).

Hypothesis 10: KM success has a positive influence on APKI - Performance Increase (PI).

Hypothesis 11: KM success has a positive influence on APKI - Innovativeness (INN).

Linear regression and Pearson correlation analysis were employed to analyse the hypotheses 8 – 11 and results are depicted on Table 36 and Table 37 respectively. A significant relationship is noticed between KM success and academic performance indicators (increased research output, grounded graduate, performance increase and innovativeness) with r (correlation coefficient) range of $.967 < |r| < .995$ with $p < 0.001$ as shown in Table 36.

Table 36: Correlations[b] among KMSU and APKI

		KMSU	IRO	GG	PI	INN
KMSU	Pearson Correlation	1	.995**	.995**	.987**	.992**
	Sig. (2-tailed)		.000	.000	.000	.000
IRO	Pearson Correlation	.995**	1	.990**	.981**	.983**
	Sig. (2-tailed)	.000		.000	.000	.000
GG	Pearson Correlation	.995**	.990**	1	.972**	.992**
	Sig. (2-tailed)	.000	.000		.000	.000
PI	Pearson Correlation	.987**	.981**	.972**	1	.967**
	Sig. (2-tailed)	.000	.000	.000		.000
INN	Pearson Correlation	.992**	.983**	.992**	.967**	1
	Sig. (2-tailed)	.000	.000	.000	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

b. Listwise N=445

Hypothesis 8

The linear regression analysis presented on Table 37 shows the influence of KM success on academic performance indicators - Increased Research Output with correlation coefficient (r) = .995 and $R^2 = .991$. Similarly, the regression equation was discovered at F equals 47982.695, $p < .001$ and 444 degree of freedom showing that the variables are significantly related. Similarly, β value (predictor coefficient) equal .338 with $t = 219.050$ at $p = .001$ is an indication that KM success (independent variable) has a high positive impact on increase research output (dependent variable). Since the p values are less than .05, the alternate hypothesis is accepted and the null hypothesis is rejected thereby establishing a positive influence of KM success on academic performance indicator (Increased Research Output).

Hypothesis 9

The linear regression results for confirming the KM success influence on academic performance indicator - Grounded Graduate are also presented on Table 37 showing the changes in item scores where the significant regression equation revealed at F equals 47130.644, $p < .001$ and 444 degree of freedom with R^2 of .991 and r equal to .995. The results indicate that KM success and grounded graduate have positive and linear relationship. Similarly, the β value (predictor coefficient) = .346 with t = 217.096 at p = .001 suggests that KM success (independent variable) has a positive influence on grounded graduate (dependent variable). Since p values are less than .05, alternate hypothesis is accepted while the null hypothesis rejected implying that KM success has a positive influence on academic performance indicator (Grounded Graduate).

Hypothesis 10

Linear regression is used here to examine the influence of KM success on academic performance indicator - Performance Increase. The result as shown on Table 37 indicates a strong relationship between the variables with correlation coefficient at r = .987 and R^2 = .974. The table also shows changes in item information score with regression equation (F (1, 433) = 16707.801, p = .001) showing that KM success and performance increase have positive and linear relationship. Meanwhile, β value (predictor coefficient) = .316 with t = 129.259 at p = .001 already indicates an influence of KM success (independent variable) on performance increase (dependent variable). Since all the p values are less than .05, alternate hypothesis is accepted while the null hypothesis is rejected confirming that KM success actually has a positive influence on academic performance indicator (Performance Increase).

Hypothesis 11

The linear regression results indicating the influence of KM success on academic performance indicator innovativeness were also presented on Table 37. These results confirmed that KM success and innovativeness have a strong relationship with correlation coefficient (r) range at .992 and R^2 at .985. The table presents information about the changes in item scores where regression equation was discovered at F as 286640.841, $p < .001$ and 444 degree of freedom – a good indication of a positive linear relationship between KM success and innovativeness. Similarly, the β (predictor coefficient) = .355 with t = 169.236 at p = .001 shows that KM success (independent variable) has a high positive effect on innovativeness (dependent variable). Since p values are less than .05, alternate hypothesis is also accepted while the null hypothesis is rejected. Hence, KM success has a positive influence on academic performance (Innovativeness) just as earlier postulated by (Ohiorenoya and Eboreime, 2014).

Table 37: Results of Linear Regression Between KMSU and (APKI)

Hypo-thesis	VARIABLE		r	R^2	F	SIG (F)	β	t	SIG (t)
	Dependent	Independent							
8	IRO	KMSU	0.995	0.991	47982.695	0.001	0.338	219.050	0.001
9	GG		0.995	0.991	47130.644	0.001	0.346	217.096	0.001
10	PI		0.987	0.987	16707.801	0.001	0.316	129.259	0.001
11	INN		0.992	0.985	28640.841	0.001	0.355	169.236	0.001

5.2.4. Structural Equation Models (SEM)

This study presented three models which were based on the research questions stated in section 1.3.1. SEM is the statistical tool adopted to analyse the model, and the first phase is goodness of fit where main output is extracted. Meanwhile, Jenatabadi *et al.* (2017) considered the following as the most important elements to investigated: comparative fit index (CFI), root mean square error of approximation (RMSEA), Chi-square statistics (CMIN), normed fit index (NFI), relative fit index (RFI), Tucker Lewis index (TLI), incremental fit index (IFI), and the goodness of fit index (GFI). meanwhile, the under listed rules were used to predict the model, and they are highlighted as the parameters for the model goodness of fit and not less than four of these rules are required to be significant (Jenatabadi *et al.*, 2017).

Rule 1	CFI	=<	0.9
Rule 2	NFI	=<	0.9
Rule 3	TLI	=<	0.9
Rule 4	IFI	=<	0.9
Rule 5	RFI	=<	0.9
Rule 6	GFI	=<	0.9
Rule 7	RMSEA	>	0.08

5.2.4.1. Structural Model (Process, Enabler and Strategy Capabilities and KMSU)

The first model was developed based on research question 2 and 3 to show the relationship between KM capabilities (knowledge management process (knowledge capture, knowledge sharing, knowledge storing and knowledge reuse), knowledge management enabler (leadership, people, technology infrastructure and organisational process), knowledge management strategy (policy, planning and funding)) and KM success. The figure 13 reveals a moderate relationship between the strategy and process, strategy and enable, and process and enabler at 0.34, 0.80 and 0.42 respectively. Similarly, figure 13 (where all the factor loadings were greater than 0.4) suggests that strategy, process and enabler have significant positive impact on KM success at β equals 0.14, 0.36

and 0.42; p-value <0.001 respectively. Table 38 shows the relationship between strategy capability, process capability, enabler capability and KM success. The fitting index result as indicated by Table 38 shows that five (IFI, NFI, CFI, TLI and RFI) out of the six indices displayed model fitting while RMSEA value is not acceptable because it is greater than acceptable value (<0.08). Based on the argument of Jenatabadi *et al.* (2017), acceptable model must possess at least four model fitting. Thus, this model is acceptable as more than four of the indices meant with the criteria required.

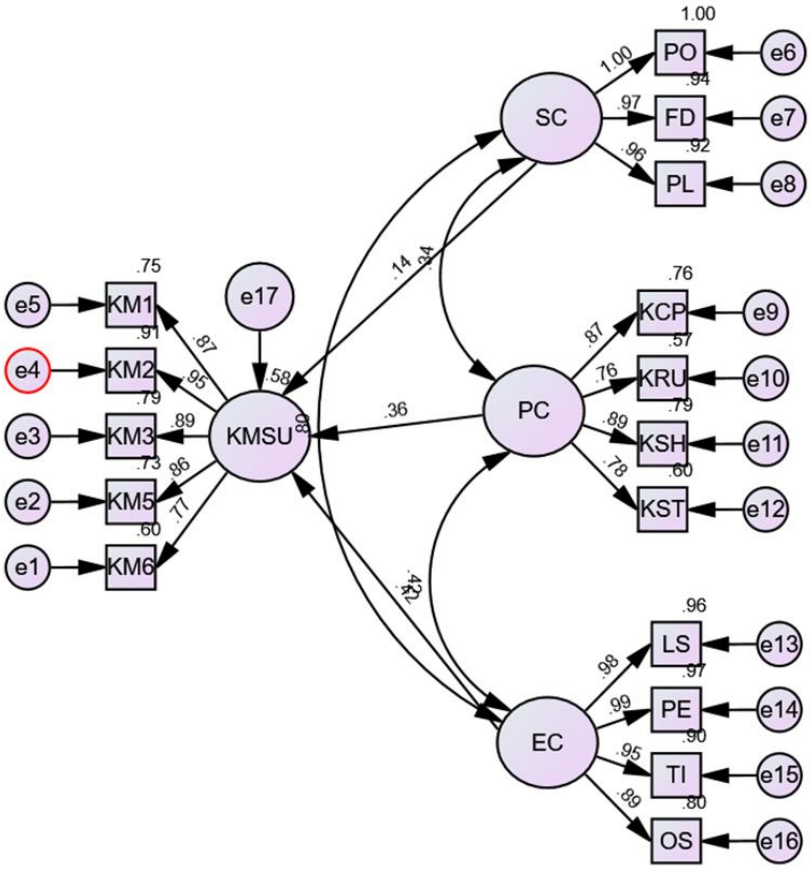

Figure 13 Influence of KM capabilities (Process, Enable and Strategy) on KM success

Table 38 Model Fit Summary (KM Capabilities - Process, Enable and Strategy and KM Success)

Fix Index	Primary Model	Critical (Accepted) Value
NFI	0.920	>0.9
CFI	0.929	>0.9
TLI	0.913	>0.9
IFI	0.929	>0.9
RFI	0.902	>0.9
RMSEA	0.126	<0.08

5.2.4.2. Structural Model (Process, Enabler and Strategy Capabilities and AP)

Second Model was developed based on research question 4 to show relationship between KMC (process, enabler and strategy and KM success while figure 14 reveals a moderate relationship between the strategy and process, strategy and enable, process and enabler at 0.34, 0.80 and 0.42 respectively. The figure also shows that the factor loadings were greater than 0.4 suggesting that strategy, process and enabler have a significant positive impact on KM success at β equals 0.13, 0.36 and 0.42; p-value <0.001 respectively. Table 39 shows a relationship of strategy capability, process capability and enabler capability with KM success. The fitting index result as displayed on Table 39 shows that five (IFI, NFI, CFI, TLI and RFI) out of the six indices have model fitting while RMSEA value is not acceptable because it is greater than acceptable value (<0.08). Since acceptable model must possess minimum of four model fittings (Jenatabadi *et al.* 2017), this model is acceptable as more than four of the indices meant the criteria required.

Table 39: Model Fit Summary

Fix Index	Primary Model	Critical (Accepted) Value
NFI	0.923	>0.9
CFI	0.931	>0.9
TLI	0.913	>0.9
IFI	0.931	>0.9
RFI	0.903	>0.9
RMSEA	0.132	<0.08

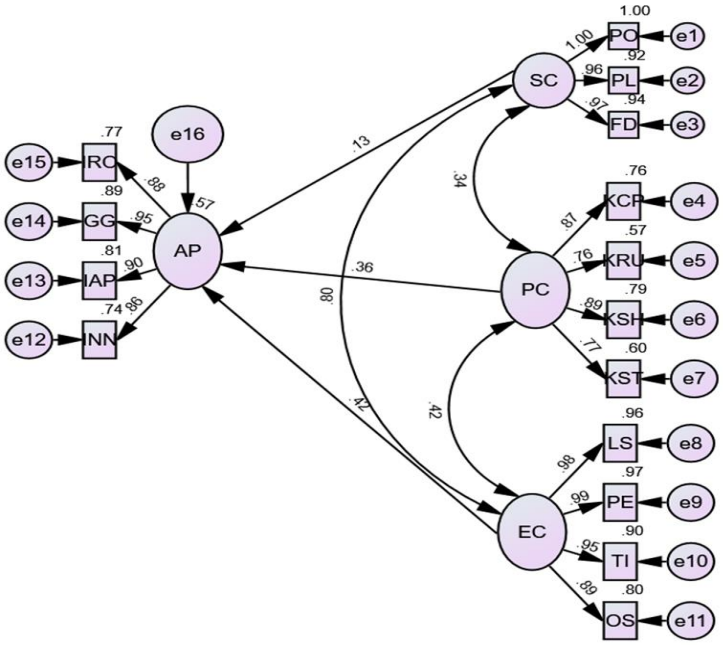

Figure 14: Influence of KM Capabilities (Process, Enable and Strategy) and AP

5.2.4.3. Structural Model (KMSU and AP Indicators)

The third model was also developed based on research question 4 to demonstrate the relationship between knowledge management success and academic performance indicators (increase research output (IRO), innovativeness (INN), increase academic performance (IAP) and grounded graduate (GG)). Figure 15 shows a significant positive impact of KM success on IRO, GG, IAP and INN at β equals 0.72, 0.85, 0.73 and 0.73; p-value<0.001 respectively. The figure 15 also revealed that all the factor loadings were greater than 0.4. The Table 40 revealed the relation of KM success with AP indicators – IRO, GG, IAP and INN. The result as reflected in Table 40 shows that IFI, NFI, CFI, TLI and RFI values exhibited model fitting while RMSEA value is greater than acceptable value (<0.08). Thus, this model is acceptable as more than four of the indices meant with the criterial required for acceptable model (Jenatabadi *et al.*, 2017).

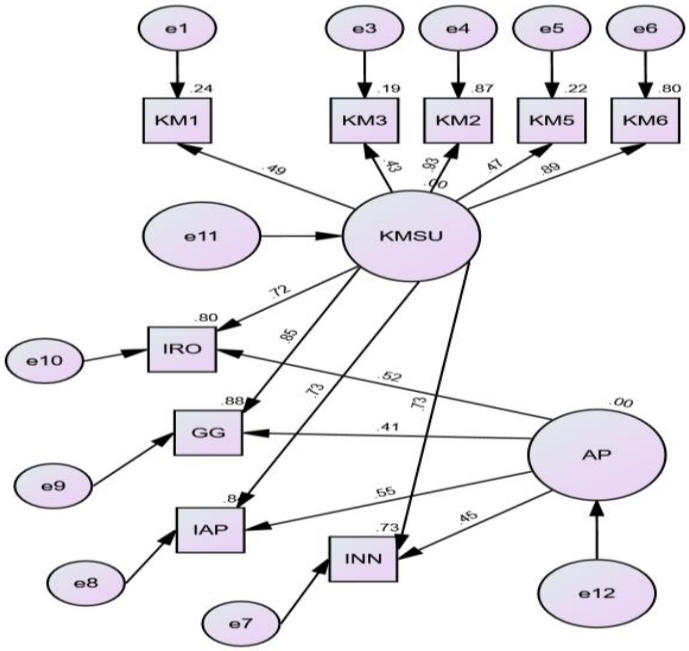

Figure 15: Impact of KM Success on AP Indicators

Table 40: Model Fit Summary (KM Success and AP Indicators)

Fix Index	Primary Model	Critical (Accepted) Value
NFI	0.963	>0.9
CFI	0.969	>0.9
TLI	0.952	>0.9
IFI	0.970	>0.9
RFI	0.941	>0.9
RMSEA	0.95	<0.08

5.3. Qualitative Findings

The qualitative data generated via the open ended questionnaire (Appendix E) is analysed with Content Analysis and the presentation of findings is guided by the research questions. The process of transforming the qualitative data was discussed in section 4.13.2. The study adopted Atlas.ti 8 and Excel 2010 to compile and analyse the data.

5.3.1. RQ1 (section 1.6)

The following three questions are raised to address RQ1

Q7: What is the extent of KM awareness in your institution?

This question shows people's opinion on KM awareness level in the institutions investigated as depicted on Table 41. About 8% of the participants claimed that the awareness is poor, 15% rated it below average, 16% said it is average, 43% felt the awareness level is good, and only 1%felt it is satisfactory while 17% accepted that the level is still at a growing stage. Here, 'Good' is of the highest percentage implying that there is an awareness of KM in the institution. This finding agrees with Oke, Ogunsemi and Adeeko (2013).

Table 41: KM Awareness Level

Categories	**Volume**	**Percentage**
Satisfactory	3	1%
Average	72	16%
Improving	78	17%
Poor	35	8%
Good	195	43%
Below average	68	15%

Q8: Who is responsible for KM in your institution?

This question measured how well KM is grounded in the institutions. Exactly 24% claimed that the librarian is responsible for KM coordination, 31% claimed it is the ICT department, 20% said it is academic staff, 8% believed it is the administrative staff while 11% could not attribute it to anybody in particular as presented on Table 42.

Table 42: KM Personnel Allocation

Categories	Volume	Percentage
KM Department	2	0%
Librarian	110	24%
ICT department	140	31%
Academic staff	91	20%
Administrative section	35	8%
No particular person	78	11%

Q9: What can you say about KM portal in your institution?

Response to this question was used to determine the existence of KM portal in the institutions. The results on Table 43 show that 55% were not aware of KM portal while 41% took the university's web site as the KM portal. Similarly, 4% admitted that there is KM portal but it is only meant for knowledge sharing while only 1% claimed that the available KM portal is only linked to the expert system. All these suggest that KM is yet to get to a maturity stage as knowledge sharing is still not properly in practice.

Table 43: KM Portal Availability

Categories	Volume	Percentage
No KM portal	250	55%
University web site serve as KM portal	185	41%
KM portal is just to share information	16	4%
KM portal is link with an expect system	5	1%

5.3.2. RQ2 and RQ3 (section 1.6)

To answer these research questions, the contributions of KM capabilities (enabler capability strategy capability and process capability) towards KM success were examined and result depicted on Tables 44 - 50

5.3.2.1. Enabler capability

The four variables proposed as enabler capability (leadership, people, technology infrastructure and organisational process) were examined using the open ended questionnaire.

Leadership:

Q24: In what way do you think management team can influence KM success?

Table 44 shows that not less than 55% of the respondents believed that the activity categories (displayed on the table) by the leadership of the institution can lead to KM success in the institution.

Table 44: Ways leadership can influence KM success

Categories	**Volume**	**Percentage**
Giving incentives	250	55%
Involving fully in KM practice	300	66%
Creating awareness	210	46%
Providing adequate facilities	230	51%
Commitment/dedication	250	77%
Make policy that that enhance KM	250	55%
Open interaction/communication	300	66%

Q25: Why do you think management should be a role model?

Table 45 answered this question by displaying that over 54% of the total respondent believed that management, as a role model, will promote KM success in their institutions.

Table 45: Leadership serving as role model

Categories	**Volume**	**Percentage**
to encourage others	350	76.9%
their decision maker	250	54.9%
their Image maker / public figure	320	70.3%
To achieve good result	400	87.9%
Their viewed as knowledge carrier	360	79.1%
they act as apex	430	94.5%

People:

Q30: Why do you think KM cannot survive without people?

KM effectiveness needs to be measured by the number of its beneficiaries. Going by Table 46, over 77% of the respondents did not believe that KM can survive without people since people are the knowledge carrier, originator, executor and driver. 91% agreed that knowledge is meaningless without people, and human intervention is important to survival as believed by 86% of the respondents.

Table 46: KM cannot survive without people

Categories	Volume	Percentage
They are knowledge carrier	350	77%
Originator and source of knowledge	400	88%
knowledge driving force	375	82%
Knowledge needs human intervention and support	390	86%
Knowledge is meaningless without people	415	91%
Are executor of knowledge	350	77%

Q31: What is your opinion in motivating people to contribute positively to KM success?

Table 47 addressed this question by confirming that over 56% of the respondents believed that people can easily be motivated to participate in KM practices by support fund, conducive learning system, awareness creation, knowledge carrier recognition, educating and encouraging people.

Table 47: Motivating people

Categories	Volume	Percentage
Fund support	300	66%
Providing conducive learning system	257	56%
Creating awareness	350	77%
Recognition of knowledge carrier	359	79%
Educating them	400	88%
Encouragement	395	87%

Technology:

Q36: Do you think KM can survive without ICT? Why

Table 48 shows that more than 60% of the respondents claimed that KM cannot survive without technology infrastructure for easy access to information, effective information transfer, data storage, work effectiveness and robust platform for KMP.

Table 48: KM can survive without ICT? Why

Categories	Volume	Percentage
It is the easy access to information	350	77%
Effective passing of information	275	60%
IT make storage of information easy	400	88%
It aids work effectiveness	420	92%
Provided platform for KMP	375	82%

Q37: How does this technology infrastructure help you to discharge your duty?

Table 49 suggests that more than 56% of the respondents believed that technology infrastructure makes work faster and easier, helps in knowledge acquisition, information dissemination, smooth conduct of duties and responsibilities. Hence, technology infrastructure is an important element of an effective KM (Nawaz and Gomes, 2014).

Table 49: Technology infrastructure helps to discharge your duty

Categories	**Volume**	**Percentage**
Makes work faster and easier	395	87%
Acquire/gain more knowledge	253	56%
Speed up passing information	389	85%
Smoothly and effectively conduct duty	400	88%
Provide knowledge at the right time of need	369	81%

Organisational Process

Q43: In what way can environment contribute to KM success?

Table 50 presents a result where 66% of the respondents picked conducive environment as a response to the question while 55% and 44% advocated availability of technology and better facilities respectively. This agrees with Ainissyifa (2012) that organisational process is a roadmap to improve KM effectiveness.

Table 50: Environment contribution

Categories	**Volume**	**Percentage**
Provision of conducive environment	300	66%
Making supporting technology available	250	55%
Better facilities	201	44%

5.3.2.2. Strategy Capability

Q53: In what way can strategic plan improve innovation efficiency and quality?

Table 51 reported that 56% of the respondents identified motivation for compliance, and 64% advocated for creating plan for continuity. Meanwhile, 87% voted policy provision and 90% identified planning for availability of KM facilities as the only way Strategic Plan can improve innovation efficiency and quality.

Table 51: Strategic plan to improve innovation efficiency and improve quality

Categories	Volume	Percentage
Motivation for compliance	256	56%
Providing policy to enforce KM activities	398	87%
Creating plan for continuity of good innovation	289	64%
Plan for availability of KM facilities	410	90%

Q54: Why should knowledge strategy be linked with institution's objectives?

As presented on Table 52, over 55% of the respondents believed that the link will improve knowledge sharing, avoid mission-less and purposeless pursuit, prevent waste of resources, drive towards same goals and be used as check and balance. This confirms Attallah, Athab and Abed (2015) submission that strategy capability is a key factor to KM effectiveness.

Table 52: Knowledge strategy and institution's objectives

Categories	Volume	Percentage
For improve knowledge sharing	260	57%
To avoid mission-less and purposeless pursuit	395	87%
To prevent waste of resources	250	55%
To drive towards same goals	300	66%
For check and balance	285	63%

5.3.2.3. Process Capability

Q71: Why do KM Process has the capability to promote KM success

As depicted on Table 53, over 53% of the respondents think it is because KM process can create avenue for knowledge sharing, make way and provide storage for knowledge captured, promote information exchange for problems solving, and enhance smooth knowledge drills.

Table 53: KM Process Capability and KM Success

Categories	Volume	Percentage
Create avenue to share knowledge	240	53%
Make way for captured knowledge	241	53%
Provide storage for knowledge captured	350	77%
Promote exchange of information for solving problems	400	88%
It enhances smooth knowledge drills	259	57%

Q72: In what way can KM Process influence KM success?

Table 54 shows that 7% of the respondents claimed that KM process has no influence on KM success, 11% believed it has a partial influence, 64% argued that it is more effective, 88% saw it as an excellent influence while 92% said it is positive.

Table 54: KM Process influence on KM success

Categories	**Volume**	**Percentage**
More effectively	294	64%
Positively	420	92%
Partially	50	11%
Excellently	399	88%
No influence	30	7%

5.3.3. RQ4 (section 1.6)

The following questions were used to examine the above research question.

Q78: How will KM improve academic performance?

Table 55 presents the answer to RQ4 where over 55% of the respondents claimed that the enhancement could be based on the KM abilities to promote exchange of information which results in widening of intelligence, rebirth new idea or knowledge, aid research and learning, improve perfection and possession of experience, and increase innovativeness.

Table 55: KM and Academic Performance

Categories	**Volume**	**Percentage**
Promotes exchange of information which result in widening of intelligence	238	52%
Rebirth of new idea/knowledge	228	50%
It aids research and learning	241	53%
Improves perfection and possession of experience	231	51%
Increases innovativeness	305	67%

Q79: In what way can tacit and explicit knowledge add to someone's intelligent?

Table 56 reveals that 49% and 57% of the respondents claimed that tacit and explicit knowledge could help individuals to respectively discover their abilities and create new knowledge. Meanwhile, 66% said it is through the creation of new ideas, 77% believed that it can be used to develop individual knowledge while 88% claimed that it helps to accurately execute tasks.

Table 56: Tacit and Explicit Knowledge

Categories	**Volume**	**Percentage**
leads to discovering abilities	223	49%
Helps to create new knowledge	259	57%
Creation of more ideas	300	66%
Helps to execute task accurately	402	88%
Develop individual knowledge	350	77%

The Tables 55 and 56 agree with the findings of Masrek and Zainol (2015) that KM success/effectiveness has a positive impact on academic performance.

5.4. Chapter Summary

The data gathered through the research instrument was analysed and presented in this chapter. Biographic profile of the respondents and the research findings detailing the responses to each of the research items were presented also. The hypotheses drawn were addressed to resolve all the research questions raised. The finding showed that (1) KM awareness level is high and at a developing state in Nigerian tertiary institutions. (2) There is a linear relationship between KM awareness level, current status and familiarity. (3) There is a significant difference between the academic staff and the student awareness level. (4) Process capability (knowledge capture, knowledge sharing, knowledge storing and knowledge reused) was discovered to have positive influence on KM success. (5) Enabler capability (leadership, people, technology infrastructure and organisational process) was discovered to have positive influence on KM success. (6) Strategy capability (planning, policy and fund) was discovered to have positive influence on KM success. (7) KM capabilities (process, enabler and strategy) contribute positively to the KM success and have a linear significant relationship with academic performance. (8) Also, it was revealed that KM success has positive influence on academic performance key indicators (grounded graduate, increased research output, performance increase and innovativeness). The next chapter gives in detail the interpretation and discussion on both the quantitative and qualitative findings and presents a model for implementation of KM success in tertiary institutions.

CHAPTER SIX

Result Interpretation and Discussion

6.1. Introduction

Being guided by the related studies reviewed in this study, this chapter interprets and discusses the research findings towards achieving the study objectives. The discussion is based on the research questions (RQs) following the quantitative and qualitative analysis of the associated findings and a complete interpretation of results obtained.

6.2. RQ1

RQ1 examines the awareness level of the tertiary institutions in south west of Nigeria, and the findings are qualitatively and quantitatively analysed as follows:

6.2.1. Quantitative Findings

The hypothesis findings presented in chapter five section 5.2.3.1 confirmed that the awareness level in Nigerian tertiary institutions was high even though KM is still at a developing phase. KM awareness level among the academic staff and students was found to be different and linear relationship was discovered between KM awareness level, KM familiarity and current KM status.

6.2.2. Qualitative Findings

Three follow-up questions were raised to address RQ1 in section 5.3.1 where KM awareness level in south west Nigerian institution is found to be okay. However, no particular office in the universities is responsible for KM and each institution made use of its web site rather than knowledge portal for knowledge or information sharing. Hence, KM awareness is still at an infant stage in Nigerian universities.

6.2.3. Discussion and Interpretation

The outcome of the research analysis for both quantitative and qualitative agrees with Ohiorenoya and Eboreime (2014) and Oke, Ogunsemi and Adeeko (2013) that awareness level of KM is high in tertiary institutions because south-western Nigerian institutions recognise knowledge as a valuable resource (Laoufi *et al.*, 2011). Although the awareness level is high in the south west tertiary institutions, the current status of KM was discovered to be at a developing stage and the KM familiarity levels amongst the academic communities are still at the intermediate. These findings agreed with the argument that KM is still at an emerging state in the developing countries (Anvari *et al.*, 2011; Agarwal and Marouf, 2014; Yaakub and Yousif, 2014; Demchig, 2015; Ojo,

2016; Charles and Nawe, 2017), and not yet fully implemented in Nigeria (Agarwal and Marouf, 2014; Ojo, 2016).

Differences in awareness level among the academic status (student and staff) were also noticed in conformity with the findings of Krubu and Krub (2011) and Akuegwu and Nwi-ue (2013) where academic staff (Heads of Department) were more involved in KM practice. Furthermore, the study observed a linear relationship between KM awareness level, KM familiarity and KM current status. Linear relationship implies that there will be an upgrade in KM current status of any institution once there is an increase in KM awareness level and familiarity among members of the academic community.

However, since empirical test already confirmed that KM awareness level is high in all the federal, state and private universities in the South West region of Nigeria, Nigerian institutions do recognise the importance of KM towards achieving institutional innovations and higher performance but calls for improvement.

6.3. RQ2

RQ2 identifies the KM success factors in Nigerian tertiary institutions. The factors were selected through a thorough literature review (Section 4.13.2) and the findings are discussed as follows.

6.3.1. Quantitative Findings

Eleven (11) sub hypotheses were raised on RQ2 and their findings were presented in chapter five (section 5.2.3.2). In which case, enabler capability, strategy capability and process capability contributed positively to the KM success in tertiary institutions.

6.3.2. Qualitative Findings

Two questions for each variable were raised (section 5.3.2) and findings reported in chapter five confirmed that enabler, strategy and process capability all have roles to play in the success of KM.

6.3.3. Discussion and Interpretation of findings

The overall results show that process capability has a positive influence on every KM implementation success and it is regarded as a very powerful and effective tool to manage knowledge. This study discovered that the ability of PC that creates avenue for knowledge capturing, sharing, storing and reusing greatly promotes information exchange to solve problems and enhance smooth knowledge drills. These abilities adjudged positive influence of PC on KM success in the institution.

People as an enabler capability are observed to be positively contributing to the KM success in Nigerian tertiary institutions just as previously reported by Ainissyifa (2012) and Kamaruzzaman *et al.* (2016). Knowledge naturally resides in the human brain, and the willingness of an individual to share his or her knowledge is becoming an issue that may cause setbacks for KM practice. People are a significant element to KM because they are the originator and manager of knowledge and capable of using the acquired knowledge, expertise and skills to create new concepts, ideas, and innovation for the benefit of their institutions. Knowledge is therefore meaningless without humans who are actually its carrier, driving force and executor.

Another enabler capability leadership was also revealed as a positive contributor for achieving KM success in Nigerian tertiary institutions. This finding is in line with Munir's and Rohendi's (2012) and Alonderiene's and Majauskaite's (2016) findings that full participation of principal officers has a positive influence on KMP effectiveness. Thus, commitment and readiness of top management staff encourage the other subordinate staff to willingly participate in KM practice which brings great achievement to KM practice.

Technology infrastructure, another enabler capability, was divulged to have a positive influence on KM success in tertiary institutions. This is in line with the earlier submissions of (Ainissyifa, 2012; Pérez-López and Alegre, 2012; Nawaz and Gomes, 2014; Bharadwaj, Chauhan and Raman, 2015; Masa'deh, Almajali and Alrowwad, 2019). Availability of technological tools saves time and makes knowledge available and KM practice easier.

The study also revealed that organisational process influences KM success positively in tertiary institutions. This is in agreement with some of the existing literature (Laal, 2011; Ainissyifa, 2012) where KM success is said to depend on laid-down procedure that motivates learning, enhances skill and improves knowledge application to attain desirable results. An effective organisational process aids knowledge availability as at when needed and also promotes knowledge sharing and transfer among the respective staff and students.

Strategy capability (policy, planning and fund) also contributes positively to the KM success (section 4.2.3.2), as previously postulated by Kim *et al.* (2014) and Oluikpe (2012). The findings reveal that policy as KM strategy contributed positively to KM success. This result is consistent with Mohajan (2017) findings. Similarly, planning as strategy capability also contributes positively to KM success (Oluikpe, 2012; Kim *et al.*, 2014) just as fund does (Ohiorenoya and Eboreime 2014). Adequate funding goes a long way in making KM implementation project in Nigerian tertiary institutions a success.

6.4. RQ3

This section weighs the impacts of knowledge capability variables (process, enabler and strategy) against KM success in order to measure the impacts of KM on tertiary institutions.

6.4.1. Quantitative Findings

Three hypotheses (H2, H3 and H4) were raised and findings presented in section 5.2.3.3. It was discovered that enabler capability, strategy capability, and process capability have linear relationship with KM success and contribute positively to KM success.

6.4.2. Qualitative Findings

The qualitative findings in section 5.3.2 show that all the investigated factors positively contributed to KM success in the tertiary institutions.

6.4.3. Discussion and Interpretation of findings

These variables were empirically discovered to have a positive effect on KM success as their absence resulted in KM implementation failure. Bhusry *et al.* (2012) linked failure of KM to elements of KM capabilities such as lack of sharing culture, lack of KM awareness, and failure to integrate KM into everyday working practices. Bhusry *et al* (2012) view that KM capabilities have the ability to determine failure or success of KM implementation prompted this study to propose process, strategy and enabler capability as assessment tools to measure KM impact on Nigerian institutions. These tools are also regarded as the measuring gauge to evaluate the KM impact, as well as the reagents that sustain, enhance, promote, stimulate, encourage and boost KM practice in Nigerian tertiary institutions.

6.5. RQ4

This section discusses the influence of KM success on academic performance key indicators namely increased research output, grounded graduate, performance increase and innovativeness. Also, the impacts of knowledge capability variables (process, enabler and strategy) against academic performance are discussed in the section.

6.5.1. Quantitative Findings

Seven hypotheses (H5 – H11) were raised and findings presented in section 5.2.3.4 to discover that enabler, strategy, and process capability all have significant relationship with academic performance. Using grounded graduate, increased research output, performance increase and innovativeness as key performance indicators for academic performance, the study observed that KM success also has a great influence on these academic performance key indicators.

6.5.2. Qualitative Findings

Two questions (Q78 and Q79) were raised (section 5.3.3) and findings presented in chapter five. It was discovered that effective KM possesses some abilities such as promoting exchange of information that results in widening of intelligence, rebirth of new ideal or knowledge, promoting research and learning, improving perfection and possession of experience, and increasing innovativeness. These abilities of KM greatly enhance academic performance in academic community.

6.5.3. Discussion and Interpretation of findings

The study discovered that all the KM capabilities are significantly related to academic performance thereby agreeing with findings of some previous researchers (Allameh, Zare and Davoodi, 2011; Zwain, Teong and Othman, 2012; Al-Hakim and Hassan, 2013; Kim *et al.*, 2014; Masa'deh *et al.*, 2017). Similarly, all the components of the enabler capability were found to be effective on academic performance. However, the findings showed that one of the enabler capability factors - technology infrastructure - is inconsistent with Fattahiyan *et al.* (2013) but consistent with other researchers such as (Pérez-López and Alegre, 2012; Sulisworo, 2012; Kamaruzzaman *et al.*, 2016) who believed that KM capabilities play interwoven roles in enhancing academic performance.

This study also confirms that effective KM practice influences academic performance indicators (increased research output, grounded graduate, performance increase and innovativeness) as discovered by (Muhammad *et al.*, 2011; Russli and Kassim, 2012; Masrek and Zainol, 2015; Masa'deh *et al.*, 2017).

6.6. RQ5

A conceptual KM model was developed for KM implementation towards enhancing academic performance in Nigerian tertiary institutions (research objective 5: section 1.3.2). It was an integrated model that combines all components of the three adopted KM model discussed in section 2.8 with additional component tagged organisation knowledge (OK). The three existing KM models (KM solution and KM foundation, KM capability and organisation knowledge effectiveness and KM capabilities and firm performance) were adopted to give strength to the new integrated KM model. Hence, the designed KM model (section 3.4.1) as depicted in figure 6, consists of organisation knowledge, enabler capability, strategy capability, KM system, process capability, KM intermediate outcome, and academic performance.

6.7. Chapter Summary

This chapter presents comprehensive discussions and interpretations of the research findings in accordance with the literature reviewed. It was discovered that contributions of the KM process, strategy and enabler capability lead to success in KM practice and thus enhance academic learning process, create innovation, increase performance, increase research output and provide grounded or employable graduates. The next chapter presents the summary, conclusion and recommendation.

CHAPTER SEVEN

Conclusions and Contributions

7.1. Introduction

This chapter is the concluding part and gives the summary of every chapter in this thesis. That is, it summarises the research findings and on which basis it presents the conclusion. It also discusses research limitations, identifies the existing knowledge gaps, and provides feasible recommendations for further studies.

The chapter is group into eight sections. The first section discusses the summary of the thesis, and the second section elaborates on summary of the finding. The third section is a discussion on how the research questions were answered while the fourth section presents the conclusion but in three different subsections and subjects the impact of the study, the recommendation, the research limitation, and suggestion for further research.

7.2. Summary of the Thesis

Chapter one provided an introduction to the study and offered a theoretical background in relation to KM in tertiary institutions. It also discussed the research problem statement, presented the objectives, and questions, as well as the expected contributions to knowledge. In Chapter two, the empirical review of KM and its relevance to tertiary institutions were presented This was followed by a discussion of the influence of KM on academic performance. Various KM models as studied by previous authors were also reviewed. Chapter three was a conceptual and theoretical review of the study where eleven hypotheses were presented to establish the relationship between KM practice, KM success and academic performance in south-west Nigerian tertiary institutions.

Chapter four was all about the research design and methodology adopted in this study, as well as the rationale for choosing the research paradigm, approaches and designs. It gives the details of the research population, sampling size, instrument adopted, and the procedure for data analysis and research framework. In chapter five, research findings were presented using statistical and content analysis to answer the research questions and address the research hypotheses.

Chapter six discussed and interpreted the research findings and chapter seven only presented the general overview to conclude the entire study. The major contribution of the study to knowledge was also discussed and recommendations for future studies were offered to address the research limitations highlighted.

7.3. Summary of the finding

The findings, which are based on the research questions and hypotheses raised in this study as discussed in chapters four and five, are summarised in this section.

7.3.1. RQ1 - What is the awareness level of KM? (section 1.3.1)

The results in section 6.2 show that: (1) tertiary institutions recognise knowledge as valuable asset; (2) KM awareness level is high but still at the developing phase; (3) there is a difference in the awareness level of academic status and that; (4) there is a significant relationship between the KM level of awareness, KM current status and KM familiarity. Thus, it is clear that Nigerian tertiary institutions acknowledge that knowledge is an essential resource that is needed to increase academic performance. KM awareness is high among the institutions although there is a need for improvement in order to reach maturity.

7.3.2. RQ2 - What are the factors responsible for successful implementation of KM? (section 1.3.1)

The study (section 6.3) discovered that: (1) leadership has a positive contribution on KM effectiveness; (2) people has positive influence on KM effectiveness; (3) technology infrastructure has positive impact on KM effective; and (4) organisational process is positively significant to KM effectiveness. Similarly, process capability (capture, storing, sharing, and reuse) and strategy capability (planning, policy and fund) were found to have a positive influence on KM effectiveness. All these factors were empirically traced to have significant relationships with a successful KM implementation.

7.3.3. RQ3 - How can impacts of KM be measured? (section 1.3.1)

The findings depicted in section 6.4 recognise process capability, strategy capability and enabler capability as a catalyst for KM practice success in institutions. Hence, process, strategy and enabler capability were presented in this study as the assessment tools to measure KM success in Nigerian institutions.

7.3.4. RQ4 - Can KM influence academic performance? (section 1.3.1)

The results (section 6.5) show that: KM capabilities have significant relationship with academic performance as KM effectiveness is significantly related to APKI (increased research output, grounded graduate, innovativeness, and performance increase). Thus, this study regards KM capability as an actor that plays interwoven roles towards enhancing academic performance.

7.3.5. RQ5 - How can a KM success model be developed? (section 1.3.1)

Effective KM is mostly necessary amongst institutions because it is regarded as a powerful asset to development and learning. The fifth objective of this study is a model development where a conceptual KM success model was proposed to provide a platform for successful implementation of KM practice in order to enhance academic performance in the Nigerian tertiary institutions.

The new integrated KM model (NIKMM) was built on three existing models which were Becerra-Fernandez model of KM practice, KM capabilities and organisational knowledge effectiveness theoretical model, and KM capabilities and firm performance theoretical model. NIKMM consists of seven (7) components namely: organisational knowledge, strategy capability, enabler capability, process capability, knowledge management system, knowledge management intermediate outcome and academic performance. NIKMM is integrated into the institution's activities by connecting all the seven components together to promote best practices and enhance academic performance.

7.4. How the Research Questions Were Answered?

The quantitative and qualitative techniques were adopted in this study and the rationale for choosing the convergent parallel of mixed method was elaborated in sections 4.3.4 and 4.5. Open ended (unstructured) questionnaire was used to collect qualitative data while the closed ended (structured) was used for the quantitative data. Short sentences were used in the design of the questionnaire and the questions ranged from simple to complex. Few questions that needed clarity were designed using dichotomous questions which propel the participants to answer either 'yes' or 'no'. Other questions were designed with Four Likert scales to stimulate the participants' attention to their response to the questions and avoid easy responses or guesses. The questionnaire is in five segments (A, B, C, D & E) with section A dealing with respondent's demography while sections B, C, D and E deal with the subject matter as contained in appendix E. The questionnaire was eventually administered to 10 tertiary institutions of 500 respondents in total, and the respondents were guided accordingly.

The data gathered from the questionnaires was coded, tabulated and analysed based on the research questions and hypotheses stated using qualitative and quantitative data analysis. The qualitative data which was non-numerical in nature was analysed using content analysis while quantitative data was analysed using statistical tools listed - Chi square, Pearson correlations, linear regression, multiple regression analysis and structural equation model. Demography data collected in section A of the questionnaire as well as the participants' responses in sections B, C, D, E of the

questionnaire were also analysed with the frequency count distributions, and graphical representations were by the pie chart and histogram (appendix F).

7.5. Conclusions

Following the research findings and research questions raised to address the research objectives, this thesis draws some conclusions under the following subheadings:

7.5.1. Conclusion on KM awareness level

Frid's KM model was deployed to confirm that KM awareness level is high but still at a developing stage. There is a significant difference in KM awareness level reflecting differences in academic status (academic staff and students), suggesting that academic staff participated more in KM practice than students. The relationship between awareness, familiarity and current status of KM was empirically determined and a positive relationship was discovered to also suggest that an increase in one automatically affects the others. The more KM awareness increases within the academic community, the more people or institutions participate in KM practice that shifts the KM status from developing to maturity. Therefore, this study established that tertiary institutions in Nigeria recognise knowledge as a valuable asset and appreciate the importance of KM towards achieving institutional innovations and higher performance.

7.5.2. Conclusion on factors responsible for KM success

The literature reviewed could not identify precise elements for KM process and enabler but revealed some knowledge gaps in the application of KM strategy in the Nigerian South West tertiary institutions. Hence the study proposed elements for KM process, enabler and strategy and subjected them to empirical investigation to realise that they all have positive influence on KM success or effectiveness just as postulated by Allameh, Zare and Davoodi (2011). KM process, enablers and strategies are therefore recognised as the reagent that promotes, enhances, stimulates and sustains KM success in tertiary institutions.

7.5.3. Conclusion on effective metrics to measure KM

KM is regarded as a recipe for promoting innovation and performance increase in tertiary institutions (Ogunbanwo, Okesola and Buckley, 2020), and its failure has always been linked to its inappropriate integration with its capabilities (Bhusry, Ranjan and Nagar, 2012). These factors are found having positive effect on KM success as their absence could cause KM failure. Therefore, this study presented process capability (knowledge capturing, knowledge sharing, knowledge storing and knowledge reuse), enabler capability (leadership, people, organisational process and

technology infrastructure) and strategy capability (planning, policy and fund) as a measuring grade for KM in Nigerian Tertiary Institutions.

7.5.4. Conclusion on influence of KM on academic performance

Although notable works have been done on the possible impacts of KM on organisation's performance in business sectors, only very few are available on AP especially in Nigerian tertiary institutions. On testing the impact of KM capabilities on AP, this study found that process capability has a moderate relationship while the enabler capability and strategy capability have a strong relationship. Regression analysis similarly shows a positive linear relationship between the KM capabilities and the AP thereby confirming KMC as a significant driver of AP.

7.5.5. Conclusion on developed KM success model

For any organisation to be successful, there is always a need to balance the surfeit of knowledge within that organisation (Chournazidis, 2013). This study presented NIKMM as an integrated model to promote knowledge circulation and availability when needed. Since no study has yet recorded KM implementation success in Nigeria tertiary institutions (Chapter two), the proposed NIKMM has the ability to promote best practice as postulated by Dalkir (2011), by linking the organisational knowledge with the KM capabilities (PC, EC and SC) and KM system.

7.5.6. Overall conclusion

Although it was discovered that the KM awareness level is high it is at a developing stage which is in level 2 as specified by Frid's KM model. This finding shows that the institutions have overgrown the stage of recognising knowledge as an essential asset but now focussed on the adoption, development and implementation of KM vision and goals. These findings show that the state of KM in Nigerian institutions is still far away from maturity level. Also, a positive linear relationship was also noticed among KMC, KMSU and AP indicators. For a successful implementation of KM practice, therefore, KM system must possess all the proposed process capability platform (capture, sharing, storing and reuse), supported by the proposed enabler capability (LE, PE, TI and OP) and well established strategy capability (policy, planning and fund). Based on these findings a model was developed to promote KM effectiveness in the tertiary institution in Nigeria.

7.6. Effect of the study

Firstly, the study investigated the level of KM awareness among the tertiary institutions and discovered that Nigeria institutions are still lagging behind. This finding is handy to guide the institutions' stakeholders to work on the University system towards attaining maturity level.

Secondly, this study empirically proves the relevance of KM processes, KM enablers and KM strategies to a KM practice success towards promoting academic performance. This information can guide institutions to accomplish effectiveness in knowledge management practice within the academic community.

Also, this research work clarifies factors that can promote KM implementation success in tertiary institutions, thereby contributing to the body of knowledge by introducing "funding" as a new success factor in the Nigeria's context. The findings can also be used as knowledge based for further studies.

7.7. Recommendations

For Nigerian education system to enhance their AP through KM capabilities the following is recommended.

- Knowledge capturing and sharing should be encouraged among the university community
- Serious attention should be placed on the adequacy of the enabler capability
- KM should be well funded
- KM Strategic policy and planning should be clearly stated

Also the integrated KM model developed is recommended for adoption. This model will enhance KM practice success in tertiary institutions as it links the institutional knowledge, KM capabilities and KM system together to promote best practice and improve performance.

7.8. Research Limitations

Tertiary institutions comprise components such as students, research and training, academic staff, non-academic staff and faculty, all of which create and reuse knowledge. For logic reasons and avoidance of information overload, this study is restricted to students and academic staff in selected tertiary institutions in western Nigeria. The study considers only two components (academic staff and students) of a university community. Some other components of academic community such as non-academic staff and faculty are not considered. The research output may therefore be biased as the research findings may not be applicable to every component. The result of a study restricted to South-western region may also not be a good test of findings for cultural, political, and geographical factors that may have varying effects on each of the regions.

Similarly, many members of the target audience from the institutions were not cooperating for the lack of incentives. The author had to seek the indulgence of the principal officers to appeal and gain

attention of a number of participants. This took more research time and reduced the number of our target institutions to 10 from 11, which is insignificant to affect the scientific validity of the findings. Some respondents were also reluctant to give out their information for fear of the unknown. It is therefore possible that some information they released is incorrect thereby making collected data deceitful and research output misleading but was ameliorated with the adoption of the mixed method.

7.9. Suggestions for Further Research

The model proposed in this study should be independently reviewed and replicated in different settings for possible identification of more enablers and process capabilities. Secondly, although the study discovered high level of KM awareness in Nigerian tertiary institutions but the level of involvement of these institutions is differ. Thurs, further research is needed to investigate the level of KM maturity in each institution and the degree of which each university is engaged in KM capabilities. Thirdly, the knowledge sharing was presented as the most crucial out of the elements of process capability thus, the barrier of knowledge sharing in Nigerian institution can be investigated in order to promote knowledge sharing. Lastly, the effect of knowledge management capabilities (process, enabler and strategy) presented in the study can be investigated on administrative aspect of the Nigerian institutions as this study only focused on academic and students.

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Appendices

Appendix A: Ethical Clearance

UNISA university of south africa

UNISA COLLEGE OF SCIENCE, ENGINEERING AND TECHNOLOGY'S (CSET) RESEARCH AND ETHICS COMMITTEE

26 September 2017

Ref #: 062/ASO/2017/CSET_SOC
Name: Afolakemi Simbo Ogunbanwo
Staff #: 58556214

RECEIVED
2017 -10- 02
OFFICE OF THE EXECUTIVE DEAN
College of Science, Engineering and Technology

Dear Mrs Afolakemi Simbo Ogunbanwo

Decision: Ethics Approval for 5 years (Humans involved)

Researchers: Afolakemi Simbo Ogunbanwo
ICT Directorate, Tai Solarin University of Education, Ijagun, Ogun State, Nigeria
58556214@mylife.unisa.ac.za, +234 701 261 9112

Supervisor (s): Prof S. Buckley
sherbuck@gmail.com, +27 82 574 7457

Proposal: Knowledge Management Towards Enhancing Academic Performance in Tertiary Education

Qualification: PhD Computer Science

Thank you for the application for research ethics clearance by the Unisa College of Science, Engineering and Technology's (CSET) Research and Ethics Committee for the above mentioned research. Ethics approval is granted for a period of five years from 26 September 2017 to 26 September 1922.

1. The researcher will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
2. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should

Open Rubric

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Appendix A: Cont.

be communicated in writing to the Unisa College of Science, Engineering and Technology's (CSET) Research and Ethics Committee. An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.

3. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.
4. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data require additional ethics clearance.

Note:
The reference number 062/ASO/2017/CSET_SOC should be clearly indicated on all forms of communication with the intended research participants, as well as with the Unisa College of Science, Engineering and Technology's (CSET) Research and Ethics Committee

Yours sincerely

Adèle da Veiga

Dr. A Da Veiga

Chair: Ethics Sub-Committee School of Computing, CSET

Prof I. Osunmakinde

Director: School of Computing, CSET

(PROF IW ADERTON)

Prof B. Mamba

Executive Dean: College of Science, Engineering and Technology (CSET)

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Appendix B: Permission letter

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PERMISSION LETTER

Request for Permission to Conduct Research at Tai Solarin University of Education

Knowledge Management towards Enhancing Academic Performance in Tertiary Institutions

05-05-2017

The Registrar,

Tai Solarin University of Education,

Ijagun, Ogun State.

Nigeria.

Dear Sir,

I, Ogunbanwo Afolakemi Simbo is doing research with Buckley Sheryl, a professor in the School of Computing towards PHD in Computer Science at the University of South Africa. We are inviting you to participate in a study entitled knowledge management towards enhancing academic performance in tertiary institutions.

The aim of the study is to investigate empirically the impact of knowledge management in enhancing academic performance in the tertiary institution, having the following specific objectives:

- Determine appropriate mechanism for knowledge assessment in tertiary institutions in Nigeria.
- Ascertain the influence of knowledge management on academic performance
- Identify effective metrics to measure knowledge management
- Develop a model for knowledge management in the tertiary institution

Your institution has been selected because of its geographical location.

The study will entail filling of questionnaire narrow on knowledge management in the institution.

The study will create effective flow of knowledge within the institution which will make learning easier for the student.

There is no potential risks as the questions constructed are not personal questions but a general questions tailor towards knowledge management.

Yours sincerely

Ogunbanwo Afolakemi Simbo

UNISA PHD Student

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Appendix C: Consent letter

UNISA

Ref. No. 062/ASO/2017/CSET_SOC

CONSENT TO PARTICIPATE IN THIS STUDY

I, AKINKUOWO Afodeji, confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read and understood the study as explained in the information sheet.

I have had sufficient opportunity to ask questions and am prepared to participate in the study.

I understand that my participation is voluntary and that I am free to withdraw at any time without penalty.

I am aware that the findings of this study will be processed into a research report, journal publications and/or conference proceedings, but that my participation will be kept confidential unless otherwise specified.

I agree to the recording of the questionnaire.

I have received a signed copy of the informed consent agreement.

Participant Name & Surname: AKINKUOWO Afodeji

Participant Signature: ..... Date: 20/10/17

Researcher's Name & Surname: Afolakemi Simbo Ogunbanwo

Researcher's signature: ..... Date: 18/10/2017

Appendix D: Participant Information Sheet

UNISA university of south africa

PARTICIPANT INFORMATION SHEET

02-05-17

Dear Prospective Participant,

My name is Ogunbanwo Afolakemi Simbo and I am doing research with Buckley Sherley, a Professor in the School of Computing towards a PHD at the University of South Africa. We are inviting you to participate in a study entitled Knowledge Management towards Enhancing Academic Performance.

I am conducting this research to find out the impact of knowledge management in enhancing academic performance in the tertiary institutions

I got your detail for the establishment office of the institution and you are chosen due to your years of service and experience in the institution. I have approximately 1,000 prospective participants for this research. The study involves close-ended and open-ended questionnaire about knowledge management in your institution. Filling the questionnaire will take at most 30 minutes of your time.

Participating in this study is voluntary and you are under no obligation to consent to participation. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a written consent form. You are free to withdraw at any time and without giving a reason.

There is no risk involved in this research as the questionnaire does not contain any personal question.

And you have the right to insist that your name should not be recorder anywhere and that no one, apart from the researcher and identified members of the research team, will know about your involvement in this research. Your answers will be given a code number or a pseudonym and you will be referred to in this way in the data, any publications, or other research reporting methods such as conference proceedings. Your answers may be reviewed by people responsible for making sure that research is done properly, including the transcriber, external

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Appendix D Cont.

coder, and members of the Research Ethics Review Committee. Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

Hard copies of your answers will be stored by the researcher for a minimum period of five years in a locked filing cabinet in Nigeria for future research or academic purposes; electronic information will be stored on a password protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. After five years the hard copies will be shredded while the electronic copies will be permanently deleted from the computer.

This study has received written approval from the Research Ethics Review Committee of the School of Computing, Unisa. A copy of the approval letter can be obtained from the researcher if you so wish.

If you would like to be informed of the final research findings, please contact Ogunbanwo A. S on 07012619112 or 58556214@mylife.unisa.ac.za. The findings are accessible for a period of 1 year. Should you require any further information or want to contact the researcher about any aspect of this study, please contact Ogunbanwo A. S on 07012619112 or 58556214@mylife.unisa.ac.za.

Should you have concerns about the way in which the research has been conducted, you may contact Prof. SB Buckley, +27825747457. Contact the research ethics chairperson of the Unisa College of Science, Engineering and Technology's (CSET) Research and Ethics Committee, Dr A Da Veiga if you have any ethical concerns.

Thank you for taking time to read this information sheet and for participating in this study.

Thank you.

Ogunbanwo Afolakemi Simbo

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Appendix E: Research instruments

QUESTIONNAIRE ON KNOWLEDGE MANAGEMENT TOWARDS ENHANCING ACADEMIC PERFORMANCE

SECTION A

Personal Information

Gender:

Marital Status:

Educational Qualification:

Designation:

Years of Experience/Level:

Institution Name:

Ownership of the Institution: *(Please tick the box below)*

Private: **Federal:** **State:**

SECTION B

General Question on KM

Research Question: *What is the awareness level of knowledge management in tertiary institution?*

1. What is the awareness level of knowledge management in your institution?
   a) Very high b) High c) Low d) None
2. The institution recognise knowledge as part of their asset base
   a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree
3. What is the current status of knowledge management in your institution?
   a) Matured b) developing c) on pipeline d) Not in existence
4. How will you grade your level of experience and familiarity with knowledge management?
   a) Advanced b) Intermediatec) Introductory d) Unaware
5. There is no knowledge management portal.
   a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree
6. When did your institution start to make use of knowledge management?

7. Who is responsible for knowledge management in your institution?

8. What can you say about KM awareness in your institution?
9. What can you say about KM portal in your institution?

SECTION C

Knowledge Management Processes in Place

Research question: Are effective processes in place for the knowledge capturing, sharing, storing and reuse

10. Do you have knowledge portal

    a) Yes b) No

If Yes answer questions 12 and if No answer questions 13 - 20

11. What does your knowledge portal entails?
12. There is mechanism in place for knowledge capturing

    a) Yes b) No

13. There is mechanism in place for knowledge sharing

    a) Yes b) No

14. There is mechanism in place for knowledge reuse

    a) Yes b) No

15. There is mechanism in place for storing knowledge

    a) Yes b) No

16. List the techniques for knowledge capturing
17. List the techniques for knowledge sharing
18. List the techniques for knowledge reuse
19. List the techniques for storing knowledge

SECTION D

Research question: *How can the impacts of knowledge management be measured.*

Knowledge Management Enabler Capabilities

Leadership as knowledge management pillar:

H_1: *Leadership as Knowledge Management Pillar contributes positively to the success of knowledge management in the tertiary institutions.*

20. Commitment of the management staff can influence knowledge management positively

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

21. Leadership involvement is a stronghold in knowledge management effectiveness.

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

22. High priority should not be assigned to knowledge management by the management team.

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

23. Management team should stand as role model to motivate other members.

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

24. In what way do you think involvement of management team can influence the km success?

25. Why do you think that management should be role model

People as knowledge management pillar:

H_2: *People as Knowledge Management Pillar contributes positively to the success of knowledge management in the tertiary institutions.*

26. Expects play a role in identifying important information for other users.

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

27. People in the institution make use of the information they get to improve their work

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

28. Knowledge management can survive without people

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

29. Sharing of information among the institution community can improve productivity.

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

30. Why do you think km cannot survive without people

31. What is your opinion in motivating people to contribute fully in km

Technology as knowledge management pillar:

H_3: *Technology as Knowledge Management Pillar contributes positively to the success of knowledge management in the tertiary institutions.*

32. Availability of internet and intranet at all time can enhance knowledge management activities.

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

33. Allocating e-mail to all member grantee easy access to information.

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

34. ICT plays an important role in knowledge management.

a) Strongly Agree b) Agree c) Disagree d Strongly Disagree

35. Search engines, video conferencing and blog help in acquiring and creating new knowledge

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

36. Do you think knowledge management can survive without ICT? Why

37. How does this technology infrastructure help you to discharge your duty?

Organization process as knowledge management pillar:

H4: *Organisation as Knowledge Management Pillar contributes positively to the success of knowledge management in the tertiary institutions.*

38. The institution's structure allows and facilitates institution's components to accomplish their mission according to KM services

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

39. Institution provides better environment for improving work knowledge

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

40. All the member of the institution have right to visit and access KM services

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

41. The institution has culture intended to promote knowledge sharing.

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

42. What are the culture in place to promote knowledge sharing

43. In what way can environment contribute to success of KM

Knowledge Management Strategy Capabilities

Policy

H5 *Policy as KM strategy contributes positively to the success of knowledge management in the tertiary institutions.*

44. Strategic KM policy can improve innovation efficiency and improve quality.

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

45. Making policy to reward knowledge carrier can promote KM practice.

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

46. There is no policy intended for improving knowledge retention

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

Planning

H6 *Planning as KM strategy contributes positively to the success of knowledge management in the tertiary institutions.*

47. The knowledge strategy should be link with the institution's objectives

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

48. Poor strategic planning can lead to unsuccessful implementation of knowledge management process

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

49. Adequate planning for acquiring and sharing of knowledge can promote KM practice here is no policy intended for improving knowledge retention

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

Funding

H7 *Funding as KM strategy contributes positively to the success of knowledge management in the tertiary institutions.*

50. Inadequate funding of KM can disrupt KM implementation

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

51. Fund should be set aside for KM

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

52. Availability of fund is a way out for KM success

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

53. In what way can strategic plan improve innovation efficiency and improve quality?

54. Why do you think institution should be link with the institution objectives

Knowledge Management Process

H6 *Knowledge management process contributes positively to the success of knowledge management in the tertiary institutions.*

Knowledge capture

55. Knowledge capture promote availability of knowledge among the institution community

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

56. Knowledge capturing promote exchange of information for solving problems

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

57. New knowledge can be created from knowledge capture

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

58. Knowledge will be available to tap or use at the appropriate time

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

Knowledge sharing

59. Interaction between the tacit and explicit create new knowledge

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

60. Knowledge sharing promote exchange of information for solving problems

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

61. Having direct link to experts in the key area for further enquiring can have positive effect on academic performance

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

62. Knowledge sharing promote teamwork

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

Knowledge storing

63. Storing information in the data warehouse help in preventing knowledge loss

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

64. Protecting the knowledge database is very important

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

65. Making use of Knowledge stored can help to conduct task exactly like an expert

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

66. Knowledge will be available to tap or use at the appropriate time

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

Knowledge reuse

67. Knowledge application help to accomplish task without much stress

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

68. Workers can gain expertise through knowledge reuse

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

69. New knowledge can be generated from stored knowledge

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

70. Knowledge reuse give room for innovativeness

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

71. Why do you think KM process has the capability to promote KM success

72. In what way can KM process influence KM success

Knowledge Management Success

73. Academic community will be more innovative.

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

74. There will be improvement in teamwork.

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

75. Operational processes will improved

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

76. Personal knowledge will become organisation knowledge

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

77. People willingly participate in KM activities

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

78. In what way can successful implementation of KM improve academic performance

79. In what way can tacit and explicit knowledge added to someone's intelligent

SECTION E

Academic Performance

Research Question: *Can knowledge management influence academic performance:*

H_7: *Knowledge management has significant influence on the academic performance.*

80. Interaction between the tacit and explicit created new knowledge which can widening the intelligent

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

81. Effective use of knowledge management can enhance academic performance in the institutions

a) Strongly Agree b) Agree c) Uncertain d) Disagree e) Strongly Disagree

82. Implementing the knowledge management can influence can influence research output positively

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

83. Successful implementation of knowledge management leads to innovativeness

a) Strongly Agree b) Agree c) Disagree d) Strongly Disagree

Appendix F: Response to Research Questionnaire

The participants' responses to the administered questionnaire (Appendix E) are discussed in this section in order to evaluate the research questions.

RQ1 (Section 1.3.1)

Four related questions (Q1, Q2, Q3 and Q4) were raised on the questionnaire to address this research question.

Q1: What is the extent of KM awareness in your institution?

The Table 57 and figure 16 depicted the participant's responses on Q1. The result shows a claim of 1% that there is no KM awareness, 25% that KM awareness level is low, 64% that the awareness is high, and 10% that it is very high only at the selected institutions. This finding conforms with the submission of Oke, Ogunsemi and Adeeko (2013) that KM awareness is above average in Nigeria.

Table 57: Response on question 1

Response	Frequency
None	3
Low	114
High	293
Very high	46
Total	456

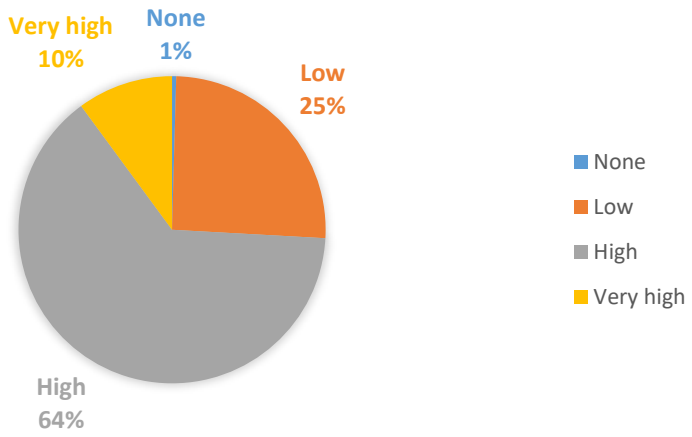


Figure 16: Response on question 1

Q2: The institution recognises knowledge as part of their asset base.

The result depicted on Table 58 and figure 17 shows that 74% (64%+10%) agrees that knowledge is recognised as part of institutions' asset base.

Table 58: Response to question 2

Response	Frequency
Strongly disagree	2
Disagree	119
Agree	290
Strongly agree	45
Total	456

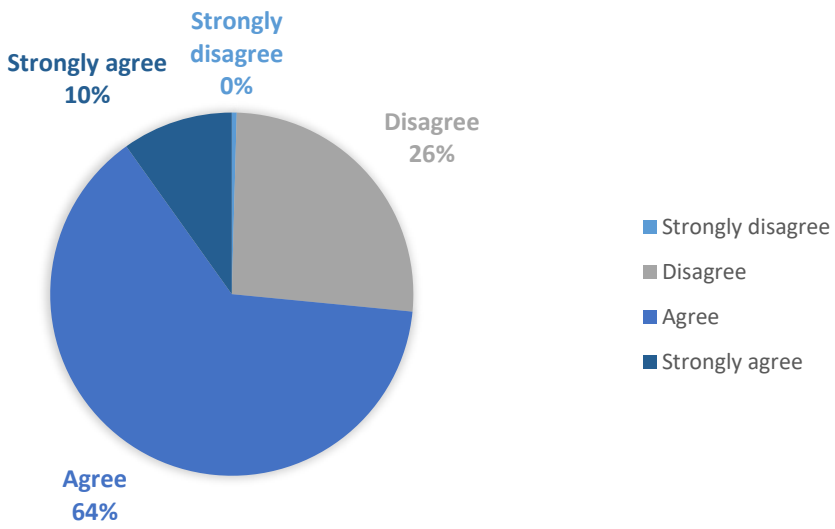


Figure 17: Response on question 2

Q3 What is the current status of KM in your institution?

Both Table 59 and figure 18 show that only 1% of the respondents mentioned that there is no KM, 26% believed that KM is on pipeline, 64% claimed that it is at the developing stage while 9% believed that KM is matured already. Considering the highest percentage, this finding implies that KM is still at a growing state in developing countries and particularly in Nigeria as previously postulated by Agarwal and Marouf (2014).

Table 59: Response on question 3

Response	Frequency
Not in existence	3
On pipeline	118
Developing	292
Matured	43
Total	456

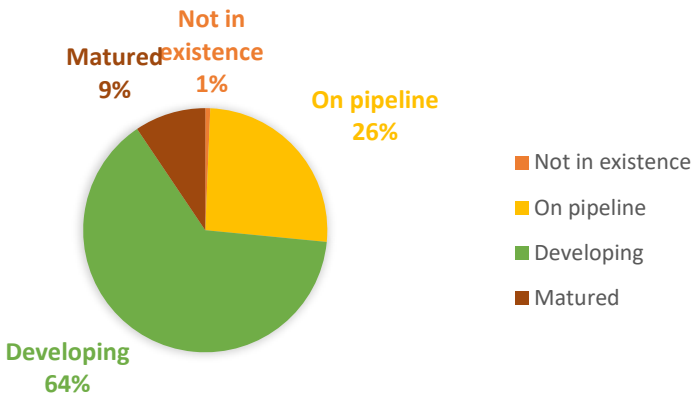


Figure 18: Response on question 3

Q4 How will you grade your level of experience and familiarity with KM?

Both Table 60 and figure 19 depict participant's responses where only 1% of them claimed they are unaware of KM, 26% and 63% believe KM is at the introductory and intermediate level respectively while 10% saw it to be at the advanced level. These findings agree with Ojo (2016) and Agarwal and Marouf (2014) that KM is yet to reach the maturity stage in Nigeria Southwest institutions.

Table 60: Response on question 4

Response	Frequency
Unaware	5
Introductory	120
Intermediate	287
Advanced	44
Total	456

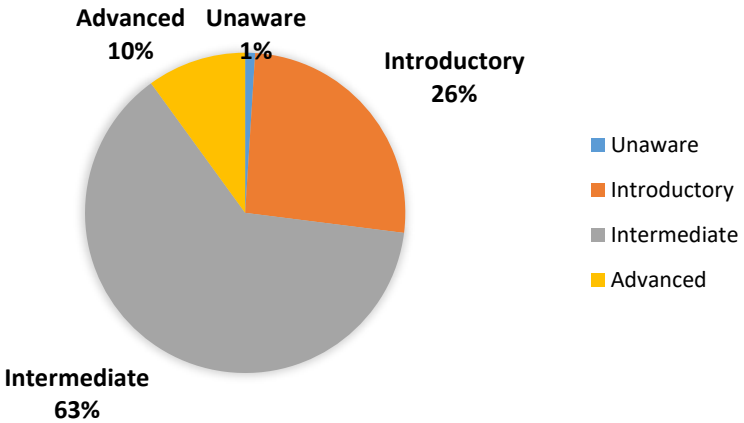


Figure 19: Response on question 4

RQ2 and RQ3 (Section 1.3.1)

Section 2.4 discussed the three viewpoints of KM - process capability, enabler capability and strategy capability – which are adopted in this study to measure KM and examine their positive contributions to the effectiveness of KM in tertiary institutions.

Enabler Capability (EC)

The literature reviewed in section 2.4.3 confirms that there are no fixed variables for enabler capability. This study however adopts the most common variables (leadership, people, organisational process and technology infrastructure) as dependent variables against KM success which is independent.

Questions 20 to 23 are used to gather information on the contributions of leadership (LE). The results depicted on Table 61 reveals that 98% of the respondents agreed that leadership influences KM effectiveness in tertiary institutions while only 2% of the respondents disagreed with this claim. This confirms the submissions of Agarwal and Marouf (2014) that top management's support is a good driving force for KM.

Table 61: Response to questions 20-23

Questions –20-23		Q20		Q21		Q22		Q23	
		Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
Responses	Strongly disagree	3	1	1	0	3	1	1	0
	Disagree	4	1	5	1	3	1	4	1
	Agree	35	7	32	7	25	5	32	7
	Strongly agree	414	91	418	92	425	93	419	92

Questions 26 to 29 were used to gather information regarding the people (PE) and the results are as presented on Table 62 where over 98% of respondents also agreed while less than 2% disagreed that people influence KM effectiveness in tertiary institutions. This is in line with Ainissyifa (2012) that people have positive effect on KM implementation.

Table 62: Response to questions 26-29

Questions 26-29		Q26		Q27		Q28		Q29	
		Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
Responses	Strongly disagree	2	0	3	1	422	93	3	1
	Disagree	4	1	4	1	27	6	3	1
	Agree	28	6	31	6	5	1	35	7
	Strongly agree	422	93	418	92	2	0	415	91

Questions 32 to 35 are used to gather information regarding technology infrastructure (TI), the results of which are presented on Table 63 where 98% of the respondents agreed that technology infrastructure positively influences KM effectiveness in tertiary institutions. This tallies with the findings of Ainissyifa (2012) that technology utilisation has a positive influence on KM success

Table 63: Response to questions 32-35

Questions 32-35		Q32		Q33		Q34		Q35	
		Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
Responses	Strongly disagree	3	1	1	0	3	1	2	0
	Disagree	3	1	5	1	3	1	4	1
	Agree	36	7	27	6	25	5	29	6
	Strongly agree	414	91	423	93	425	93	421	92

Questions 38 to 41 help to collect information on the contribution of organisational process (OP) to KM implementation. The result depicted on Table 64 also show that 98% of the participants agreed that organisational process positively contributed to successful KM in the institutions. This again agrees with Ainissyifa (2012) findings which stated that organisational process is significantly related to KM success.

Table 64: Response to questions 38-41

Questions 38-41		Q38		Q39		Q40		Q41	
		Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
Responses	Strongly disagree	2	0	4	1	3	1	2	0
	Disagree	11	2	4	1	12	2	7	2
	Agree	30	7	46	10	36	8	35	8
	Strongly agree	413	91	402	88	405	89	412	90

Strategy Capability (SC)

For reasons discussed in section 2.4.4, this study adopted three variables (policy, planning and funding) for strategy capability.

Questions 44 to 46 are used to gather information regarding the contribution of policy (PO). The result displayed on Table 65 revealed that over 95% of the participants agreed that policy contributed to KM success while less than 5% disagreed.

Table 65: Response to questions 44-46

Question – 44-46		Q44		Q45		Q46	
		Freq.	%	Freq.	%	Freq.	%
Responses	Strongly disagree	3	1	5	1	5	1
	Disagree	16	4	17	4	3	1
	Agree	39	8	38	8	37	8
	Strongly agree	398	87	396	87	411	90
	Total	456	100.0	456	100.0	456	100.0

Questions 47 to 49 are used to gather information regarding the contribution of planning (PL). The displayed results on Table 66 show that 95% of the participants believed that planning contributes to KM effectiveness in tertiary institutions.

Table 66: Response to questions 47-49

Question 47-49		Q47		Q48		Q49	
		Freq.	%	Freq.	%	Freq.	%
Responses	Strongly disagree	4	1	3	1	5	1
	Disagree	18	4	16	4	17	4
	Agree	36	8	39	8	38	8
	Strongly agree	398	87	398	87	396	87
	Total	456	100.0	456	100.0	456	100.0

Questions 50 to 52 are used to gather information regarding the contribution of funding (FD), and the result is presented on Table 67 where over 95% of the participants agreed that funding contributes to KM effectiveness in tertiary institutions but 5% disagreed.

Table 67: Response to questions 50-52

Question 50-52		Q50		Q51		Q52	
		Freq.	%	Freq.	%	Freq.	%
Responses	Strongly disagree	5	1	4	1	2	0
	Disagree	3	1	18	4	14	3
	Agree	37	8	36	8	44	10
	Strongly agree	411	90	398	87	396	87
	Total	456	100	456	100	456	100

Process Capability (PC)

Since the literature review in section 2.4.2 did not specify a precise variable for KM process capability, this study adopted the popular factors (knowledge capture, storage, sharing and reuse) that are commonly mentioned by the researchers and deployed them as independent variables against dependent variable - KM success.

Questions 55 to 58 gathered information regarding contribution of knowledge capture. The results depicted on Table 68 suggest that over 94% of the participants agreed that knowledge capture as a process capability contributes to KM implementation success and less than 6% disagreed, this conforms with Bharadwaj, Chauhan and Raman (2015) findings that knowledge capture has a significant impact on KM effectiveness.

Table 68: Response to questions 55-58

Questions 55-58		KCP2		KCP3		KCP	
		Frequency	**%**	**Frequency**	**%**	**Frequency**	**%**
Responses	Strongly disagree	7	2	8	2	4	1
	Disagree	16	4	15	3	6	1
	Agree	34	7	36	8	35	8
	Strongly agree	399	87	397	87	411	90

Questions 59 – 62 collected information on the impact of knowledge sharing, and the results are as summarised on Table 69 where over 94% of the participants agreed that knowledge sharing contributed to the successful implementation of KM. The finding is in line with Bharadwaj, Chauhan and Raman (2015) findings which declare that knowledge sharing has a positive effect on KM effectiveness.

Table 69: Response to questions 59-62

Questions 59 – 62		KSHQ2		KSHQ3		KSH	
		Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**
Responses	Strongly disagree	8	2	4	1	3	1
	Disagree	12	3	17	4	7	2
	Agree	42	9	34	7	25	5
	Strongly agree	394	86	402	88	421	92

Questions 63 – 66 helped to collect details on the contribution of knowledge storing to successful KM implementation. The results depicted on Table 70 shows that over 95% agreed while less than 5% of respondents disagreed with the claim that knowledge storing as a process capability contributes to successful KM implementation supporting the findings of Bharadwaj, Chauhan and Raman (2015) that knowledge storage actually has a significant positive influence on KM effectiveness.

Table 70 Response to questions 63-66

Questions 63 – 66		KSTQ2		KSTQ3		KST	
		Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**
Responses	Strongly disagree	5	1	6	1	5	1
	Disagree	11	2	15	3	6	1
	Agree	31	7	40	9	32	7
	Strongly agree	409	90	395	87	413	91

Questions 67 to 70 are used to assess the impact of knowledge reuse where Table 71 discloses that majority of the participants (97%) accepted knowledge reuse as a good contributor to KM success just as was stated by Bharadwaj, Chauhan and Raman (2015) where knowledge application is considered significant to KM effectiveness.

Table 71: Response to questions 67-70

Questions 67-70		KRUQ2		KRUQ3		KRU	
		Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**
Responses	Strongly disagree	5	1	4	1	3	1
	Disagree	9	2	11	2	9	2
	Agree	41	9	48	11	42	9
	Strongly agree	401	88	393	86	402	88

RQ4 (Section 1.4)

In investigating the effect of KM on academic performance, KM success was considered as an independent variable against the following key academic performance indicators: performance increase, increase research output, grounded graduate and innovativeness as dependent variables. The variables and performance indicators are discussed in this section.

KM Success (KMSU)

Questions 73 to 77 were designed to capture information regarding KM success and the results are displayed on Table 72 where almost every participant (98%) agreed that successful implementation of KM has a great effect on academic performance in tertiary institutions. This is in line with the findings of Rašula, Vukšić and Štemberger (2012) and Olaima, Issam and Al-Makhadmah (2015) that KMP has a positive influence on organisational performance.

Table 72: Response to questions 73-77

Questions 73-77		KMSQ1		KMSQ2		KMSQ4		KMSQ5		KMSQ6	
		Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
Responses	Strongly disagree	4	1	1	0	2	0	4	1	5	1
	Disagree	4	1	3	1	4	1	5	1	4	1
	Agree	70	16	81	18	80	18	77	17	74	16
	Strongly agree	378	83	371	81	370	81	370	81	373	82

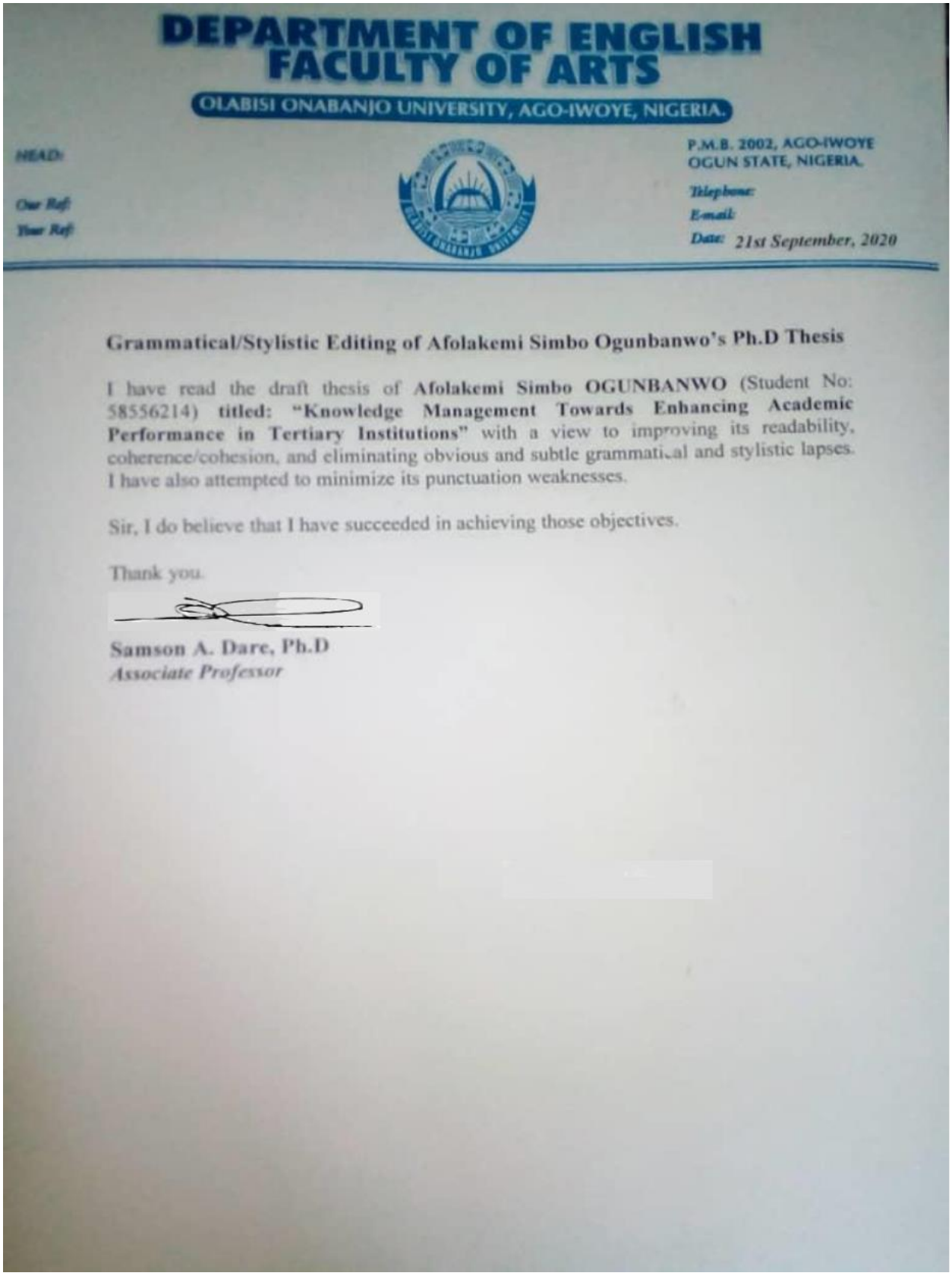
Academic Performance (AP)

Towards measuring academic performance, performance increase (Zaied, Hussein and Hassan, 2012), increase research output (Shih and Tsai, 2016), grounded graduate (Mushtaq and Khan, 2012), and innovativeness (Zaied, Hussein and Hassan, 2012) were all considered as key performance indicators. Questions 80-83 were specifically meant to gather information on academic performance and the results are as depicted on Table 73 where over 95% agreed with the indicators.

Table 73: Response to questions 80-83

Questions 80-83		AP Increase research output		AP grounded graduate		AP Increase academic performance		AP Innovativeness	
		Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
Responses	Strongly disagree	10	2	3	1	4	1	10	2
	Disagree	8	2	10	2	11	2	7	2
	Agree	25	5	33	7	27	6	27	6
	Strongly agree	413	91	410	90	414	91	412	90

Appendix G: Language Editors Letter



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Grammatical/Stylistic Editing of Afolakemi Simbo Ogunbanwo's Ph.D Thesis

I have read the draft thesis of **Afolakemi Simbo OGUNBANWO** (Student No: 58556214) **titled: "Knowledge Management Towards Enhancing Academic Performance in Tertiary Institutions"** with a view to improving its readability, coherence/cohesion, and eliminating obvious and subtle grammatical and stylistic lapses. I have also attempted to minimize its punctuation weaknesses.

Sir, I do believe that I have succeeded in achieving those objectives.

Thank you.

Samson A. Dare, Ph.D
Associate Professor