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IMPACT OF RELATIONAL CAPITAL ON PERFORMANCE OF PUBLIC UNIVERSITIES IN NORTH CENTRAL NIGERIA

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Abstract
This study examines the impact of relational capital on the performance of public universities in North central Nigeria. This study employed secondary data and primary data collected concurrently, analyzed them separately and merged them during interpretation. The population for primary data include all full time professors totalled eight thousand, five hundred and eighty-nine (8,589) from which sample size of 382 was selected while population for secondary data include all the thirteen (13) public universities in north central Nigeria. Both data were collected using structured questionnaire and from annual reports respectively. The methods of estimation employed include OLS and GMM. The result of both analyses revealed that relational capital is significantly related with teaching and community service performance but conflicting result for research performance. The study concludes that relational capital positively influences the teaching and community service performance of public universities in north central Nigeria. Therefore, the study recommends that emphasis should be placed on the quality and relevance of the research to immediate environments of the universities. Also, the study recommends that all avenues to foster cross-university linkages and collaboration with host community should be pursued by the public universities in North central Nigeria.

Keywords: *Relational capital, Research, Teaching and Community Service Performance.*

JEL Classification Codes: *O34, L29*

1. INTRODUCTION

The global environment has witnessed gradual transition for several decades from industry based which focus on tangible assets to an advanced technology, information and innovation based which focus on intangible assets such as intellectual capital (IC) (Inyada 2018). IC has been considered to contain a set of indicators that contribute to the improvement of the quality of accounting information in organisations (Ramírez & Gordillo, 2014). Therefore, a standard such as the International Accounting Standard (IAS) 38 is set as regards intangible assets and it states that intangible assets should be recognized if there is an expected future economic value attributed to it and such benefit can flow the entity. Adherence to this standard helps to provide volatile information which will consequently increase the virility of their intangible assets.

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The concept of IC was initially developed for profit-oriented entities but it has presently extended to academic environment such as universities and research centers since universities are considered critical institutional actors in national innovation systems (Salman, Mansor, Babatunde & Tayib, 2012). Currently, enormous attention is being given to knowledge, ability, skills, expertise, experience and attitude of an entity which make up intellectual resources of the entity (Ekwe, 2014). Therefore, it is necessary to harness the existence of these intellectual resources and performance of universities, especially in this new era of knowledge based economy. Traditionally, the IC of universities used to be regarded as being wholly within the ambit of essential social services and hence, did not need much fanatical accounting scrutiny. However, IC is now being acquainted with modernized technology and environment because of it impacts on legitimacy and revenue streams of the universities (Ojo, 2016).

Intellectual resources of universities have not only gained the attention of the government and private organization like Nigeria University Commission (NUC) and Tertiary Education Trust Fund (TETFund)) and International Accounting Standard Board (IASB) but also researchers such as Cabrita and Bontis (2008); Nezam, Ataffar, Isfahani and Shahin (2014); Fazlagic (2016) among others. Development of an excellent information technology system which supports staff and students in their research and studies is a form of relational resources. The relational capital which is a major components of intellectual resources of universities assist the universities in the establishment of links with outside organizations that generate into the reputation and open a substantial number of opportunities (Feng, Chen, Wang, & Chiang, 2012).

The relationships established with the environment provide the universities with knowledge that increases throughout the life and finally become an asset of great potential that is difficult to quantify (Bontis 1998). The essence of all these attributes is to enhance the performance of the university system both at federal and state level. Performance of universities can be determined by the degree of achievement made of their goals, which is to generate knowledge through conduct of research, transmit such knowledge through teaching, conduct relevant research that translate into impactful innovation and development of the society through the production of a well-trained labour force. Performance of universities is very important for the development of any country since a well-trained labour force can only result into the best management of such country's resources.

It is therefore no coincidence that the most industrialized and consequently, wealthiest countries in the world today are those with the top-performing universities. The United States of America (USA) and the United Kingdom (UK) are amongst the top five countries with the highest industrial output and so are their universities amongst the top five universities in the world ranking (Times Higher Education World Rankings 2019). The method of ranking the performance of universities today includes the use of university relational capital. The Times Higher Education (THE) World Rankings indicators include the teaching and research performance and also the quality of community services rendered by the universities. The overall performance is adjudged by the learning environment; the volume, income and reputation of their researches; the international outlook of staff and students and the amount of knowledge transfer to industries.

However, the report on the poor performance in the Nigerian university system is no longer news in our dailies and the near bottom position in the global universities ranking has not helped matters. The report, being in terms of quality of teaching, innovation, research

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output and the quality of graduates being produced (Halidu, 2015) has been blamed on the continued lack of commitment by the government and poor utilization of available resources. The issue of frequent interruption of the universities' activities (strikes) create unfavourable for Nigerian public universities which in turn negatively impacting on their performance. This was evident with FGN Needs Assessment Report that most Nigerian public universities (NPU) are in a very sorry state and are under-performing. Therefore, this study explores the impact of relational capital on performance of the Nigerian public universities. The following research hypotheses were developed with regards to each type of performance recognised in university environment.

H_{01}: relational capital has no significant influence on teaching performance of Nigerian public universities

H_{02}: relational capital has no significant influence on research performance of Nigerian public universities

H_{03}: relational capital has no significant influence on community service performance of Nigerian public universities

This study focused on relational capital component of intellectual capital and performance of the Nigeria Public Universities as previous studies were mostly conducted in other sectors of economy and other countries. The universities' business is all about teaching, learning as well as presenting their graduate to community to employ, the study therefore focused on performance within the scope of research, teaching and community services performance. The level of disparity in the North Central Zone of Nigeria regarding ethnicity and religion motivate the researcher to focuses on Nigeria public universities in the North Central Zone of Nigeria. This study is of importance to policy makers so as to regulate and monitor university education in Nigeria. The findings of the study will also be of significance as concerned practice through provision of useful information on how best to leverage on relational capital in universities so as to improve their performance.

2. LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 Intellectual and Relational Capital

Intellectual Capital (IC) was firstly described by John Kenneth Galbraith in 1969, and has since been redefined by different researchers in many ways. However, Awan and Saeed (2015) are of the opinion that there is no single universal definition that is accepted by every scholar. Among the definition consider in this study is the definition by Ramirez, Merino and Manzaneque (2019) who defined IC as the knowledge acquired and utilized by organizations, which is held in the minds of its members, embodied in its procedures and processes, and stored in its digital and non-digital media. Based on new interpretations, IC can be regarded as a set of knowledge assets that are acquired and controlled by the business and are then important mechanism for value creation (Alipour, 2012). This study emphasized the IC definition by Gavious and Russ (2009) who defined IC as the enhanced value of a firm attributable to assets, generally of an intangible nature, resulting from an entity's organizational function, processes and information technology networks, the competency and efficiency of its employees and its relationship with its customers.

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The definition of Gavious and Russ (2009) states clearly the three most accepted dimensions of IC are: organizational function, processes and information technology networks (*structural capital*), competency and efficiency of its employees (*human capital*) and relationship with its customers (*relational capital*). However, all the three component of intellectual capital are important but the focuses of this study was on relational capital. Relational capital was considered as establishment of relationships between an organization and its environment. Such relationships can be established with customers, intermediaries, suppliers, inter-organizational alliance partners, regulators, institutional figures, pressure groups, communities, creditors, and investors (Feng, Chen, Wang & Chiang, 2012). This type of relationship provide the organization with knowledge that increases throughout the life of the organization itself, becoming an asset of great potential that is difficult to quantify.

The concept of relationship is very relevant in the network of academic social interactions as it associated to a greater productivity in terms of economic, political, and institutional developments (Ramirez, Santos & Tejada, 2011). The internal and external mobility of researchers, non-academic partners, enterprises, local governments, and society in general in and out of universities open a substantial number of opportunities to enlarge the university relational capital (Ramírez, 2010). Thus, these improving the research, teaching and community service performance of the university.

2.1.2 Performance in University System

The performance of a university system could also be considered as a determinant of economic growth of any country especially a developing one like Nigeria. Therefore, the universities, despite not being profit oriented entities, have been involved in the competition for performance in value-generating processes (Gonzalez-Loureiro & Dorrego, 2011). Universities are expected to perform the function of economic growth and development (Shehzad, Fareed, Zulfiqar, Shahzad & Latif, 2014) and required to become increasingly competitive in order to valorize their capital. So, they are expected to generate knowledge through conduct of research, transmit knowledge through teaching, and solve societal problems through the production of well-trained labour force and--the conduct of relevant research and impactful innovation-- providing community services.

Performance of universities can be determined by the degree of achievement made of their goals, which is to generate knowledge through conduct of research, transmit such knowledge through teaching, conduct relevant research that translate into impactful innovation and development of the society through the production of a well-trained labour force. Performance of universities is very important for the development of any country since a well-trained labour force can only result into the best management of such country's resources. It is therefore no coincidence that the most industrialized and consequently, wealthiest countries in the world today are those with the top-performing universities. Universities as "citadels of knowledge" are involved in three major activities which are the conduction of research, transmitting knowledge through teaching and training their products to perform services to the society through community services.

Therefore this study centres the university performance on research, teaching and community services. The first, which is the research performance focused on the quality and relevance of researches done in the universities. The second, teaching performance is focused on how the universities succeed in bringing their students to their final goal. The third

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performance is in respect of community service which is about the educative services rendered in the community.

2.2 Theoretical Review

2.2.1 Stakeholder's Theory

Freedman promoted the theory of stakeholder's in1984 and believed that the stakeholders are all groups or individuals that may influence or have an effect on the organization's goals. As Freeman (2006) pointed out, the organisation's goal should be to unite stakeholders and balance stakeholders' desires, needs and perspectives. As a result, organization administrators have the duty to satisfy stakeholders' needs, desires and opinions. It includes the management of the institution, in order to guarantee its rights and its involvement in decision-making, to administer the institution for the good of the interested parties. In order to ensure the survival of the institution to preserve the long term stakes of each team, institution managers must, however, act as stakeholder agents.

In addition, Freeman (2006) notes that stakeholders are the communities that is essential to the company's existence and growth. Stakeholders are every community or person that can influence or be impacted by the fulfilment of the mission of an organization (Freeman, 1984). Hillman and Keim (2001) see participants in the education process as pupils, culture and governments. Stakeholders can be classified internally and externally where the external stakeholders are organizations within the university system that have an interest in the quality and outcomes of education provided by learners.

Freeman (2004) argued that the concept of redress of stakeholders is integrated into organizational company management. The main principle of the remedy of stakeholders is that stakeholders should bring complaint against managers for non-compliance with the requisite care duties. Freeman (2006) defined as normative, descriptive and instrumental three stakeholder theory forms. The regulatory theory is at the core of the philosophy of the players (Donaldson and Preston, 1995). The moral theory encompasses how administrators or stakeholders will behave and should look at an ethical basis for the good of the company (Friedman and Miles, 2006). The theory of norms is connected. The theory of the descriptive stakeholder focuses on how managers and stakeholders actually behave and how they look at their actions and roles while the theory of the instrumental stakeholder is that managers should work in order to maximize their profits and maximize shareholder value if they want to gain and operate in the interest of their company.

The business stakeholders, Friedman and Miles (2006), are: consumers, employees, community, suppliers and distributors, shareholders, the media, the general public, generations to come, past generations, scholars, rivals, non-governmental organisations, politicians, trade union or trade association organizations, financial institutions, government authorities, policy makers and regulators. Freeman's Strategic Management (1984) approach to stakeholders indicates that managers need to design and implement processes that accommodate all groups involved in the business. The main task of this partnership consists of controlling, incorporating and ensuring the long-term success of the company in the interactions and desires of the shareholders, staff, clients, suppliers, communities and other classes.

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The theory of participants notes that many stakeholders are critical for corporate success and development and therefore should be integrated into the decision-making process of companies (Simionescu, 2015). The following are stakeholders; owners, creditors, rivals, vendors, clients, staff, public regulatory authorities, educational and financial institutions, Freeman (1984) reports. CSR operations are carried out voluntarily by the businesses. CSR improve business relationships with key stakeholders by delivering CSR (Barnet & Solomon, 2006). As stakeholder theory underlines, the more a company can relate to many stakeholder groups which have some interest in the company, the more effective the company can be over time (Freeman, 1984). The key player theory therefore considers that companies are capable of enhancing their competitive benefits by reducing contracting costs as a connection between contracts, and states (Jensen and Meckling, 1976; Jones, 1995).

Wicks, Berman and Jones (1999) also note that companies that build trustworthy ties with their key players will reduce the cost of contracting. Barnett and Solomon (2012) suggest that companies involved in socially responsible initiatives and continuing their business strategies not only improve the partnership between the organization and its members but also increase stakeholder power by building and maintaining the allegiance of stakeholders. Stakeholders are divided in internal (employees, administrators, domestic and control bodies) and external (customers, external shareholders, suppliers, investors, media, representatives, societies, government agencies, etc). Instrumental theory of stakeholders – an essential element in stakeholder theory – emphasizes the importance of management of stakeholders, namely of the major stakeholders of businesses that can help improve society and company economic and financial performance (Jones, 1995).

Companies that have good links with their stakeholders can also recruit, retain and improve workers, thereby improving efficiency and income (Moskowitz, 1972). According to Hillman and Keim (2001), good management in stakeholders is increasing CFP through the distinguishing activities of the organization and its help in providing responsible products and quality services and / or in inviting responsible investors to socially sensitive customers or economic resources. CSR increases customer satisfaction, while increasing sales or minimizing cost operations by delivering quality and safety products and services (Waddock and Graves, 1997). The main reason for the decline of the CFP, litigation, the company's bottom line, the reputation and name (Berman, Wicks, Kotha & Jones, 1999) has been found to be the opposite of businesses acting irresponsibly.

Quality university education in Nigeria needs continuous, holistic improvement that means sharing costs both internally and externally among stakeholders. Collaboration between stakeholders is about forming collaborations with a particular organization or group due to a lack of resources or expertise (Jackson, 2009). Research must contribute to the development of the network of universities. This cooperation may be accomplished through a university which has a close relationship or association with workers / industries and other external stakeholders or through the use of technology and environmental knowledge to perform research that does not involve employees.

2.3. Empirical Review

This section of the chapter discusses the empirical studies that are previously done on relational components of intellectual capital and performance of Universities. These entails related studies from developed developing countries and on Nigeria. These are sequenced in

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terms of general studies on intellectual capital and narrowed down to relational capital. Studies on intellectual capital are becoming frequent and still upcoming evident with the following recent studies. One of such studies was study of Inyada (2018) who examined salient issues on the impact of intellectual capital on the financial performance of corporate establishments in Nigeria. Secondary data was gathered for five (5) years five (5) quoted banks purposively sampled. Multiple regressions analysis was employed to analyze the data and the result shown that intellectual capital positively and significantly impacted on the financial performance of banks.

In university environment, Cricelli, Greco, Grimaldi and Llanes (2018) explored the relationship between IC and performance of public universities in Colombia. For the purpose of analysis, the data were clustered based on five performance variables and three IC variables. The results generally revealed that different aspects of IC are associated with University performance. The study also shown that achievement of outstanding research and innovation results is related to the size of university, while education-oriented results are less related to size. This was further corroborated by Ramirez, Merino and Manzaneque (2019) who investigated the intellectual capital web reporting by Spanish universities. Content analysis was employed to analyse the websites of 50 universities in the year 2016. The secondary data which was analysed with a regression analysis found that human capital was the most disclosed category with relational capital being the least frequently disclosed. However, the quality of structural capital disclosures was higher than relational and human capital.

Also in 2019, Kweh, Ting, Hanh and Zhang (2019) carried out a study on Intellectual capital, governmental presence, and firm performance of publicly listed companies in Malaysia. Secondary data on the leading 200 companies listed on the Malaysian Stock Exchange from 2010 to 2015 are employed to estimate the value added intellectual coefficient (VAIC) model. The result of regression analysis revealed that firms with and without government ownership are not the same in term of firm performance and IC. Capital employed efficiency (*CEE*), human capital efficiency (*HCE*), and total IC have significantly positive effect on firm performance. However, the significantly positive impacts of *CEE* and *HCE* on firm performance are only found in firms without government ownership. The significantly negative effect of government presence is confirmed in the pooled data analysis, whereby only *CEE* is significantly related to firm performance for firms with government ownership.

However, the finding from the study of Khalique, Ramayah, Shah and Iqbal (2019) contradict the conclusion from above. They examined the impact of intellectual capital on the financial performance of banking sector operating in Sialkot Pakistan. The study employed structured questionnaire to obtain data from the targeted respondents which were chosen through purposive sampling technique. Smart PLS 3.0 was used to test the research hypotheses and result revealed that customer capital, social capital and technological capital appeared as the significant contributors in the intellectual capital model. Customer capital was appeared as the most significant predictor and it reflects that banking sector considered it as the most crucial for financial performance. However, human capital, structural capital and spiritual capital were seemed to be insignificant contributors in model. The findings of all these studies contributed to the mixed conclusions with earlier studies on intellectual capital. Narrowing it down to relational capital, the following studies were also reviewed.

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One of the early studies on relational capital is the study of Tumwine, Kamukamu and Ntayi (2012) who examined the impact of relational capital components on the performance of tea manufacturing firms in Uganda. The study was carried out on 59 managers representing 17 tea manufacturing firm using a correlation matrix and multiple regression models to test the hypotheses. The study revealed that relationship existed between relational capital components and firm performance. Using Tumwine *et al* (2012) questionnaire, Emmanuel (2012) examined the effect of relational capital components on firms' performance of selected small-scale enterprises in South-western geo-political zone of Nigeria. The result of the analysis depicted that relationship with suppliers, customers and internal networks among the employees were found to be positively and significantly related to firm performance.

Also in 2012, Abdulai, Kwon and Moon (2012) empirically examined intellectual capital and firm performance of software firms in West Africa. The study used primary data and the data was gathered through survey questionnaires. The data collected was then analyzed using the Partial Least Square method. The survey results showed significant relationship between intellectual capital (human, structural and relational capital) and competitive capabilities of firms and between competitive capabilities and firm performance. A similar study of this nature was also conducted by Dorrego, Costa and Fernández (2013) in Portugal but on small and medium enterprises. They examined the influence of relational capital on product innovation performance of small and medium enterprises in Portugal. A questionnaire was administered to a network of Portuguese innovative SMEs and the findings suggested that relational capital does have a positive effect on product innovation performance.

This finding was also confirmed by Datta and De (2017) who examined the role of relational capital and firm performance by analyzing a cluster of bell-metal enterprises in a rural region in West Bengal, India. Eight components of relational capital indicators were considered and they were combined into a single overall index by using principal component method. Results show that the overall index of relational capital was found to be strongly associated with profitability performance. However, all these studies were not related to universities environment. From the foregoing, one can deduce that studies that examined the relationship between relational capital components of intellectual capital on universities performance are yet to be in public domain as compared with other sectors such as banking industry, manufacturing industry and other listed firms in Nigeria. Therefore, the present study intends to fill the gaps in the literature.

3. METHODOLOGY

3.1 Research Design, Population and Sample Size

This study employed cross-sectional survey and ex-post facto research design which involved the collection of primary data through questionnaire in order to achieve better understanding of relationships between the variables. This was achieved using convergent parallel mixed method approach which involve the collection of secondary and primary data concurrently, analyzed them separately and merged them during interpretation. The secondary data on all the variables was gathered from annual reports of the selected Nigerian public universities in the northern central zone for the period of five (5) years starting from 2014, which is about the period concerted multi-faceted efforts initiated by the Federal

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Government of Nigeria and other national agencies such as National University Commission (NUC) and the Tertiary Education Trust Fund (TETFund), to revitalize the public universities to 2018, as the certainty of availability of 2019 university annual reports could not be guaranteed.

Regarding the population, there were ninety (90) of the Nigeria public universities as at 2020: forty-seven (47) of them were owned by the Federal government and forty-three (43) were owned by the State government. However, this study was being restricted to the North Central zone of Nigeria which had thirteen universities, seven (7) of which are owned by the Federal Government and six (6) by the States government. The study employed two type of data set from questionnaire and annual report of these universities. The population for secondary data were all the annual reports of these 13 public universities in North central Nigeria from 2014 to 2018 resulting to 65 observations. The total population for primary data obtained through questionnaire include all the full time academic staff of the selected universities in North central Nigeria totalled Eight thousand, five hundred and eighty-nine (8,589). The sample size of the respondents for questionnaire was determined by employing Yamane (1967) approach. This approach was chosen to assist in selecting appropriate sample size from population size of eight thousand, five hundred and eighty-nine (8589) academic staff of the Nigerian public universities.

$$n = N/[1 + N(e)^2] \quad (1)$$

Where:

n is the sample size
N is the population size
e is the level of precision

$$n = 8{,}589/[1 + 8{,}589(0.05)^2]$$
$$n = 8{,}589/[1 + 8{,}589(0.0025)]$$
$$n = 8{,}589/[1 + 21.4725]$$
$$n = 8{,}589/[22.4725] = 382.2$$

Based on this formula with 5% level of precision, the sample size of ninety-eight (382.2) respondents was arrived at. Hence, three hundred and eighty-two (382) academic members of staff were served with the self-administered structured questionnaire. In order to allow for attrition and even distribution among all the universities, the three hundred eighty-two were prorated to determine the number of each and every of the selected universities and were presented in Table.1.

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Table 1 Distribution of Questionnaire Population and Sample Size

NAME OF UNIVERSITY	POPULATION	SAMLE SIZE
University of Abuja, Gwagwalada	631	28
University of Agriculture, Makurdi	811	36
Benue State University, Makurdi	538	24
Federal University, Lokoja, Kogi State	183	8
Kogi State University,	720	32
University of Ilorin. Kwara State	1506	67
Kwara State University, Malete	460	20
Federal University, Lafia, Nasarawa State	274	12
Nasarawa State University, Keffi	550	25
Federal University of Technology, Minna,	893	40
Ibrahim Badamasi Babangida University, Lapai,	246	11
University of Jos, Plateau State	1605	71
Plateau State University	172	8
TOTAL	**8,589**	**382**

Source: Author's computation (2020)

3.2 Method of Data Collection and Analysis

The data type required for this study involves both secondary and primary data. The secondary data which include information on the components of intellectual capital and other relevant secondary data were extracted from the annual reports of each and every selected public university. The primary data was sourced through a structured questionnaire administered to three hundred and eighty two top full time professors of the selected public universities as mentioned earlier. Both data sets was analysed with descriptive and inferential statistics. The descriptive statistics include mean, minimum, maximum and standard deviation. The secondary data was analysed using a system Generalized Methods of Moment (GMM) panel regression method. The GMM is useful in dealing with short-sample periods, heteroskedasticity, autocorrelation and heterogeneity while the primary data from questionnaire was analysed with ordinary least squares (OLS) method. However, some preliminary test such as normality, correlation and multicollinearity test was conducted prior to OLS regression estimation. The OLS was estimated in line with robust estimates of standard errors in order to correct for likelihood of heteroscedasticity problem.

3.3 Model Specification

The empirical models of this study to analyze the relationship between relational capital and performance in Nigerian public universities are specified adapting the model of Cricelli *et al*. (2018). The model specification of the Cricelli *et al*. (2018) could be written as follows.

$$P_{it} = f\,(RC_{it}) \quad (2)$$

where:

P = Performance of university i at time t

RC = Relational Capital of university i at time t

Disintegrating university performance into research performance, teaching performance and community performance, the following functional equations are derived.

$$RP_{it} = f\,(RC_{it}) \quad (3)$$

$$TP_{it} = f\,(RC_{it}) \quad (4)$$

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$$CP_{it} = f\ (RC_{it}) \quad (5)$$

The models of this study therefore modifies that of Cricelli et al (2018), by incorporating control variables which are equally important in determining the performance of public universities, these variables include the size (measured by total assets), the age of the university (in years) and ownership (state or federal). As argued by Gonzalez et al. (2011), the age of the university is important factors that influence its performance. Also, in line with the submission of Gonzalez et al. (2011), university ownership matters a lot in the determination of its performance. By controlling for age and ownership, the empirical models of this study are, therefore, specified as follows.

$$RP_{it} = \alpha_0 + \alpha_1 RC_{it} + \alpha_2 Age_{it} + \alpha_3 Own_{it} + \mu_{it} \quad (6)$$
$$TP_{it} = \beta_0 + \beta_1 RC_{it} + \beta_2 Age_{it} + \beta_3 Own_{it} + £_{it} \quad (7)$$
$$CP_{it} = \Omega_0 + \Omega_1 RC_{it} + \Omega_2 Age_{it} + \Omega_3 Own_{it} + e_{it} \quad (8)$$

Where:
RP= Research Performance of university i at time t
TP= Teaching Performance of university i at time t
CP= Community Performance of university i at time t
SC= Structural Capital of university i at time t
Age = Age of university i at time t
Own = ownership of university
The α, β and Ω are the parameters to be estimated in the respective models
The μ, £ and e are the respective white noise error terms

3.4 Definition and Measurement of Variables

Definition of variables is conceived as a statement of a particular dimension or elements through which certain variable is measured. Operationalization gives room for specificity and to decisively defining variables into quantifiable factors. In other words, the procedure explains ambiguous concepts and permits them to be assessed quantitatively and empirically. Therefore, all variables employed in this research are defined in line with the intent of the study (Sekaran & Bougie, 2014). The variables (relational capital, research performance, teaching performance and community service performance) are adopted from the previous studies as stated in the previous chapter of the study.

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Table 2 Definition and Measurement of Variables

S/N	VARIABLES	SYMBOL	MEASUREMENT	SOURCE	A-PRIOR
1	**RELATIONAL CAPITAL**	RC	Number of foreign students enrolled ; Number of foreign academic staff;	Crecelie*t al,* (2018); Ramı´rez & Gordillo (2014) and Paloma (2009)	+
2	**RESEARCH PERORMANCE**	**RP**	Number of articles published; Number of research grants won. Ratio of the amount of public funds provided for Research and Development projects relative to total budget.	Crecelie*t al,* (2018); Ramı´rez & Gordillo (2014) and Paloma (2009)	+
3	**TEACHING PERFORMANCE**	**TP**	Number of first class students during graduation. Teaching facility and its accessibility	Crecelie*t al,* (2018); Ramı´rez & Gordillo (2014) and Paloma (2009)	
4	**COMMUNITY SERVICE PERFORMANCE**	**CP**	Proportion of university programs with extension services and/or community-based experience components for students relative to all programs. Relationship between universities within and outside Nigeria. Number of conferences	Ana & Edgar (2002)	+
5	**University Age**	Age	Year of establishment to date		
6	**University ownership**	Owner	Binary variable which takes 1 if university is owned by federal government and zero if otherwise.		

Source: Author's compilation (2020)

4. FINDINGS AND DISCUSSIONS

4.1 Assessment of Response Rate of respondents for questionnaire

The study also aimed at recruiting three hundred and eighty-two respondents from the thirteenth Nigerian public universities (NPU) within the North Central geo-political zone of Nigeria. The total number of the respondents was all the full time academic staff members of the NPUs. Out of 382 questionnaires distributed, 364 were returned and were properly answered. The analysis of questionnaires in accordance with universities was as described as follow.

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Table 3 Frequency and Percentage of Response Rate of Questionnaire

NAME OF UNIVERSITY	No. Distributed	No. Returned	%
University of Abuja, Gwagwalada	28	24	86%
University of Agriculture, Makurdi	36	35	97%
Benue State University, Makurdi	24	21	88%
Federal University, Lokoja, Kogi State	8	8	100%
Kogi State University,	32	31	97%
University of Ilorin. Kwara State	67	67	100%
Kwara State University, Malete	20	19	95%
Federal University, Lafia, Nasarawa State	12	12	100%
Nasarawa State University, Keffi	25	22	88%
Federal University of Technology, Minna,	40	40	100%
Ibrahim Badamasi Babangida University, Lapai,	11	10	100%
University of Jos, Plateau State	71	68	96%
Plateau State University	8	8	100%
TOTAL	**382**	**364**	**95%**

Source: Author's computation (2020)

4.2 Preliminary Test

Based on the nature of data sets employed in this study, preliminary test was conducted for primary and secondary data. The nature of the tests is peculiar to data peculiarities. The result of each preliminary test is presented under each category of the data.

4.2.1 Preliminary Test for primary data from Questionnaire

According Hair, Black, Babin & Anderson (2010), the study of this nature need to check the variables for normality, multicollinearity and heteroscedasticity to satisfy the basic and underlying assumptions of the multiple regression analysis in line with the suggestion. The result of each test is presented as follows:

i. Normality Test

In this study, the normality assumption was diagnosed by checking at both skewness and kurtosis at the same time looking at histogram residual plots. Table 4.2 show the result of the normality test.

Table 4: Normality Test (Skewness and Kurtosis)

Variables	N	Skewness	Kurtosis
Relational Capital	364	-1.517	0.975
Research Performance	364	-1.650	1.572
Teaching Performance	364	-1.710	1.438
Community Performance	364	-1.114	0.086

Source: Computation by Author (2020).

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Based on the analysis in Table 4, the residual appears to be normal and the values of skewness and kurtosis were close to zero. Therefore, the normality assumption was not violated (Afifi & Clark, 1998).

ii. Multicollinearity Test

The study checked for multicollinearity of the independent variable, structural capital using variance inflated factor (VIF) and tolerance value. Hair et al., (2010) asserted that any VIF exceeding 10 and tolerance value lower than 0.10 indicates a problem of multicollinearity. Table 5 below shows the VIF and the Tolerance value of independent variables.

Table 5 Multicollinearity Test (VIF and Tolerance)

Variables	Items	VIF	Tolerance
Relational Capital	5	1.166	.858

Source: Author's Computations, (2020).

The result in the table 5 above shows the absence of multicollinearity among the independent variables due to the fact that the VIF values are less than 10 while the tolerance values are more than .10. An examination of these results indicated that multicollinearity was not a problem.

iii. Heteroscedasticity Test

Relevant post-estimation diagnostics, particularly, the heteroskedasticity diagnostic was conducted. The result of this test is presented in Table 6.

Table 6: Heteroskedasticity Diagnostics for the OLS Estimations

Model	Chi-sq. statistic	p-value
Research Performance Model	9.88	0.002
Teaching Performance Model	1.73	0.188
Community Performance Model	0.04	0.839

Source: Author's Computations, (2020).

From the result presented in Table 6, it was clear that the research performance model has an unequal variance with its Chi-squared statistic value of 9.88 and p-value of 0.002, which indicates a significant test result and rejection of the test's null hypothesis that there was equal variance. For teaching and community performance models, on the other hand, the Chi-squared statistic values are 1.73 and 0.04 respectively, with respective p-values of 0.188 and 0.839. These indicated that the test results were not significant for both models and non-rejection of the test's null hypothesis that the models had equal variance.

4.2.2 Preliminary test for secondary data from Annual Report

Prior to the analysis of the data from annual report with GMM, pairwise correlation analysis was conducted and the results of pairwise correlation analysis are presented in Table 7 to show the relationship that exist among the variables of the model.

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Table 7: Results of Pairwise Correlation Analysis

Variable	RP	TP	CP	RC	AGE	OWN
RP	1					
TP	-0.1153	1				
	(0.360)					
CP	0.2409	0.295	1			
	(0.053)	(0.017)				
RC	0.2182	0.2804	0.4474	1		
	(0.081)	(0.024)	(0.000)			
AGE	0.0618	-0.309	0.4591	0.5309	1	
	(0.625)	(0.012)	(0.000)	(0.000)		
OWN	-0.2585	0.3216	0.3353	0.305	0.4868	1
	(0.038)	(0.009)	(0.006)	(0.013)	(0.000)	

Source: Author's Computations, (2020).*Note: p-values in parenthesis.*

From the pairwise correlation results presented in Table 7, research performance had a significant relationship with only ownership at 5% significance level and the relationship was negative, indicating that research performance and ownership move in opposite direction. Research performance also has significant positive relationship with community performance and relational capital but only at 10% significance level. Aside the above mentioned variables, research performance did not have a significant relationship with any other variable. Teaching performance has significant positive relationships with community performance, relational capital and ownership but has significant negative relationships with age. This indicates that teaching performance moves in the same direction with the former variables but in opposite direction with the latter variables. Community performance has significant positive relationships with relational capital, age and ownership. This indicates that community performance moves in the same direction with these variables. Also, relational capital has significant positive relationship with age and ownership and age has a significant relationship with ownership. From these results, it was verified that the models in which these variables were employed will not have a problem of severe multicollinearity as none of the correlation coefficients of the relationship among the explanatory variables (i.e. relational capital, age and ownership) are above the 0.8 threshold beyond with the problem of multicollinearity may arise in employing the variables in the same model.

4.3 Descriptive Statistics

This section presents summary of descriptive statistics of data collected. The summary includes mean, minimum, maximum and standard deviation as revealed for each of the variables. The summary descriptive statistics for primary data is presented in Table 8 including dependent and independent variables while that of secondary data for independent and dependent variables were presented in Table 9 and 10 respectively.

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Table 8 Summary of Descriptive for Primary data from Questionnaire

Variables	N	Min	Max	Mean	Std. Dev.
Relational Capital	364	1	5	3.980	0.908
Research Performance	364	1	5	4.008	1.007
Teaching Performance	364	1	5	4.008	1.060
Community Performance	364	1	5	3.809	1.008

Source: Computation by Author (2020).

Table 8 shows that teaching performance recorded the highest mean (M = 4.008, SD = 1.060) and community performance the lowest mean (M = 3.809, SD = 1.008). The means of all the variables are above the average of three (3) implying that they are in the high level range.

Table 9: Summary Statistics Results for Relational Capital Indicators

Variable	Mean	Std. Dev.	Min	Max
Foreign students enrolled	29.389	59.696	0	272
Foreign staff	6.054	7.1593	1	26
Staff in local exchange programs	571.8	1143.015	2	4860
Programs involved in *IT/**SIWES	24.315	11.654	4	49

Source: Author's Computations, (2020). *Industrial Training, ** Students Industrial Work Experience Scheme

Table 9 reveals summary of statistics results for the indicators of relational capital employed in this study which include number of foreign students enrolled in the university, number of foreign staff currently working in the university, number of staff involved in exchange programs with other Nigerian universities and number of programs involved in IT/SIWES. The results show that total number of foreign students enrolled in the university has a mean value of 29.389, with standard deviation of 59.696, minimum of 0 and maximum of 272. This suggests that on the average a university in the North-central region got approximately 29 foreign students enrolled into the university. The universities are widely dispersed around this average by approximately 60 foreign students. To buttress these points, the university with the lowest number of foreign student enrolled had none while the university with the highest number of foreign students enrolled had 272.

The summary statistics results also showed that total number of foreign staff currently working in the university has a mean value of 6.054, with standard deviation of 7.159, minimum of 1 and maximum of 26. This suggests that on the average a university in the North-central region has about 6 foreign staff. The universities are widely dispersed around this average by about 7 foreign staff. The university with the lowest number of foreign staff has only one foreign staff while the university with the highest number of foreign staff has 26 foreign staff.

As to the number of staff in exchange programs with other Nigerian universities, the results show that it has a mean value of 571.8, with standard deviation of 1143.015, minimum of 2 and maximum of 4860. This indicates that the average number of staff in exchange programs with other Nigerian universities is approximately 572 staff, although, there is a wide disparity of 1143 staff among these universities in terms of the number of staff involved in exchange programs with other Nigerian universities. The university with the lowest

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number of staff in exchange programs has only 2 staff while the university with the highest number of staff in exchange program has 4.860 staff.

For the summary statistics of the number of programs involved in IT/SIWES, the results show that it has a mean value of 24.315, with standard deviation of 11.654, minimum of 4 and maximum of 49. This indicates that the average number of programs involved in IT/SIWES in universities in the North-central region is approximately 24 programs. A variation of 11 programs existed among these universities in this regard. The university with the least number of programs involved in IT/SIWES has 4 programs while the university with the highest number of programs in IT/SIWES has 49 programs.

Table 10: Summary Statistics Results for Performance Indicators

Variable	Mean	Std. Dev.	Min	Max
Researches that won grant	20.862	47.915	0	305
Number of researches done annually	67.415	66.577	3	278
Number of first-class students	16.329	20.421	0	103
Scientific conferences organized in the community	23.706	51.408	1	284
Student scholarship/employment to host community	77.985	69.500	5	282

Source: Author's Computations, (2020).

The summary statistics results for the indicators of university performance employed in this study are presented in Table 10. These indicators include the number of researches that won grant, number of researches done annually, number of students that graduated with first-class degree, number of scientific conferences organized in the community and number of student scholarship/employment granted to host community. The results show that total number of researches that won grant has a mean value of 20.861, with standard deviation of 47.915, minimum of 0 and maximum of 305. This suggests that on the average a university in the North-central region conducted approximately 21 researches that won grant. The universities are widely dispersed around this average by approximately 48 grant-winning researches. To buttress these points, the university with the lowest number of grant-winning researches had zero researches that won grant while the university with the highest number of grant-winning researches had 305 researches that won grant.

The summary statistics results also show that total number of researches done annually has a mean value of 67.415, with standard deviation of 66.577, minimum of 3 and maximum of 278. This suggests that on the average a university in the North-central region has about 67 researches done annually. The universities are widely dispersed around this average also by about 67 researches. The university with the lowest number of researches conducted annually has only 3 researches while the university with the highest number of researches done annually has 278 researches.

As to the number of graduates with first-class degree, the results show that it has a mean value of 16.329, with standard deviation of 20.421, minimum of 0 and maximum of 107. This indicates that the average number of graduates with first-class degree is approximately 16 graduates, although, there is a wide disparity of about 20 graduates among these universities in terms of the number of graduates with first-class degree. The university with the lowest number of graduates with first-class degree has only zero while the university with the highest number of graduates with first-class degree has 103 staff.

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For the summary statistics of the number of scientific conferences organized in the community, the results show that it has a mean value of 23.706, with standard deviation of 51.408, minimum of 1 and maximum of 284. This indicates that the average number of scientific conferences organized by the universities in the North-central region in the host community is approximately 24. A wide variation of 51 scientific conferences exists among these universities in this regard. The university with the least number of scientific conferences organized in the community had 1 scientific conference while the university with the highest number of scientific conferences organized in the community had 284 conferences.

For the summary statistics of the number of student scholarship/employment granted to the host community, the results show that it has a mean value of 77.985, with standard deviation of 69.500, minimum of 5 and maximum of 282. This indicates that the average number of student scholarship/employment granted to the host community by the universities in the North-central region is approximately 78. A wide variation of 69 students scholarship/employment exist among these universities in this regard. The university with the least number of student scholarship/employment granted to the host community had 5 while the university with the highest number of student scholarship/employment granted to the host community had 282.

4.4 Result of Analysis

The result of analysis is presented for each of the data separately. These were further categorized for each of the dependent variables which include research, teaching and community performance of Nigerian public universities.

4.4.1 Result of Regression Analysis of Data from Questionnaire

The results of the OLS estimations are presented with references to each of the dependent variables used for university performance.

Table 11: OLS Estimation Result for Research Performance Model

Variable	Coefficient	Robust Std. Err.	T	p-value
RC	0.306	0.036	8.56	0.000
AGE	-0.049	0.034	-1.44	0.151
OWN	0.046	0.039	1.18	0.237
Constant	2.740	0.205	13.38	0.000
F-statistic	18.05			0.000
R-squared	0.213			

Source: Author's Computations, (2020).

From the result in Table 11, the F-statistic value of 18.05 and its p-value of 0.000 indicate that the overall model is statistically significant and the model is in good fit. The R-squared value of 0.213 indicates that 21.3% of variations in research performance are explained by the model at hand. The result showed that relational capital has statistically significant coefficients with p-values of coefficients being lower than 0.01. This implies that increasing relational capital by a point is favourable and will lead to an increase research performance of these universities by 0.306 points. The control variables, i.e. age and

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ownership (whether state or federal) are seen to be insignificant given that their p-values are greater than all conventional significance levels.
Table 12 shows the result of relational capital and teaching performance.

Table 12: OLS Estimation Result for Teaching Performance Model

Variable	Coefficient	Robust Std. Err.	T	p-value
RC	0.305	0.045	6.85	0.000
AGE	-0.056	0.036	-1.53	0.128
OWN	-0.009	0.047	-0.2	0.843
Constant	1.468	0.260	5.64	0.000
F-statistic	56.61			0.000
R-squared	0.472			

Source: Author's Computations, 2020.

From the result in Table 12, the F-statistic value of 56.61 and its p-value of 0.000 indicate that the overall model is statistically significant and the model is in good fit. The R-squared value of 0.472 indicates that 47.2% of variations in teaching performance were explained by the model at hand. The result shows that relational capital have statistically significant coefficients with p-values being lower than 0.01. Therefore, the result implies that increasing relational capital by a point is favourable and will lead to an increase teaching performance of these universities by 0.305 points. The control variables, i.e. age and ownership (whether state or federal) are seen to be insignificant given that their p-values are greater than all conventional significance levels. Finally, the result of OLS regression analysis is presented in Table 4.13

Table 13: OLS Estimation Result for Community Performance Model

Variable	Coefficient	Robust Std. Err.	T	p-value
RC	0.152	0.052	2.93	0.004
AGE	0.005	0.043	0.11	0.915
OWN	-0.031	0.051	-0.61	0.545
Constant	2.587	0.287	9.02	0.000
F-statistic	5.88			0.000
R-squared	0.075			

Source: Author's Computations, (2020)

The result of OLS regression in Table 13 reveals F-statistic value of 5.88 and its p-value of 0.000. This indicates that the overall model is statistically significant and the model is in good fit. The R-squared value of 0.075 indicates that 7.5% of variations in community performance are explained by the model at hand. The result shows that relational capital have statistically significant coefficients with p-values being lower than 0.01. Therefore, the result implies that increasing relational capital by a point is favourable and will lead to an increase teaching performance of these universities by 0.152 points. The control variables, i.e. age and ownership (whether state or federal) are seen to be insignificant given that their p-values are greater than all conventional significance levels.

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4.4.2 Result of Regression Analysis of Secondary data from Annual Report

The results of the system GMM estimation are presented here. This is presented under each of dependent variables such as research, teaching and community performance in Table 14, 15 and 16 respectively.

Table 14: System GMM Result for Research Performance

Variable	Coefficient	Robust Std. Err.	Z	p-value
RC	-0.100	0.020	-4.9	0.000
AGE	2.968	4.380	0.68	0.498
OWN	12.344	31.185	0.4	0.692
Constant	-64.477	116.192	-0.55	0.579
Wald Chi-sq.	1403			0.000
AR(1)	-1.036			0.300
AR(2)	1.156			0.248
Sargan	9.253			0.127

Source: Author's Computations, (2020).

From the result presented in Table 14, the result diagnostics in the lower part of the Table indicate a Wald Chi-squared value of 1403 with p-value of 0.000, which implies that the overall model is statistically significant and, hence, the model has a good fitness. The Arellano and Bond autocorrelation test in the first and second order (AR1 and AR2) show z-statistic values of -1.036 and 1.156 respectively, with respective p-values of 0.300 and 0.248. This indicates that the test null hypothesis of no autocorrelation in the first and second order could not be rejected and, hence, the model is free from autocorrelation problems. The Sargan test of over-identifying restriction shows a Chi-squared value of 9.253 with p-value of 0.127, indicating that the test null hypothesis of valid over-identifying restrictions could not be rejected and, hence, the restrictions placed on the instrument in order not to be over-identified are valid. The results of these diagnostics imply that this model is valid for relevant inference.

As for the result of the individual explanatory variables in the upper part of Table 4.11, the result shows that the coefficient of relational capital is significant at 1% significance level. This indicates that relational capital has significant impact on research performance of the public universities in the North-central region of Nigeria. Other variables such as age and ownership do not have significant impact on research performance of these universities. However, the negative coefficient indicates that increase relational capital will result to decline in research performance. With a negative coefficient of -0.100, a point increase in relational capital will induce a decline in the research performance of these universities also by 0.1 points.

The result of the system GMM estimation for teaching performance is presented in Table 15. The dependent variable is the number of graduates with first-class degree, used as proxy for teaching performance while independent variables are relational capital, age and ownership. The relational capital was computed as indexes from it indicators.

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Table 15: System GMM Result for Teaching Performance

Variable	Coefficient	Robust Std. Err.	Z	p-value
RC	0.000	0.000	2.62	0.009
AGE	0.000	0.000	0.54	0.592
OWN	-0.002	0.004	-0.52	0.601
Constant	0.002	0.005	0.42	0.676
Wald Chi-sq.	111.66			0.000
AR(1)	0.249			0.803
AR(2)	-1.213			0.471
Sargan	0.388			0.943

Source: Author's Computations, (2020).

From the result presented in Table 15, the result diagnostics in the lower part of the Table indicate a Wald Chi-squared value of 111.66 with p-value of 0.000, which implies that the overall model is statistically significant and, hence, the model has a good fitness. The Arellano and Bond autocorrelation test in the first and second order (AR1 and AR2) show z-statistic values of 0.249 and 11.213 respectively, with respective p-values of 0.803 and 0.471. This indicates that the test null hypothesis of no autocorrelation in the first and second order could not be rejected and, hence, the model is free from autocorrelation problems. The Sargan test of over-identifying restriction shows a Chi-squared value of 0.388 with p-value of 0.943, indicating that the test null hypothesis of valid over-identifying restrictions could not be rejected and, hence, the restrictions placed on the instrument in order not to be over-identified are valid. The results of these diagnostics imply that this model is valid for relevant inference. As for the result of the individual explanatory variables in the upper part of Table 15, the result shows that the coefficient of relational capital is significant at 1% significance level while age and ownership do not have significant impact on teaching performance of these universities. This indicates that relational capital has significant impact on teaching performance of the universities in the North-central region of Nigeria. Therefore, a point increase in relational capital will induce an increase in the number of first-class graduates of these universities by 0.000 individuals. The result of the system GMM estimation for community performance is presented in Table 16. The dependent variable is community performance index computed from the community performance indicators which are number of scientific conferences organized by the university in the community and number of student scholarship/employments granted to host community of university while the relational capital is computed as indexes from it indicators.

Table 16: System GMM Result for Community Performance

Variable	Coefficient	Robust Std. Err.	Z	p-value
RC	0.199	0.100	1.97	0.049
AGE	-0.075	0.106	-0.71	0.48
OWN	0.381	4.947	0.08	0.939
Constant	-4.545	3.227	-1.41	0.159
Wald Chi-sq.	261.26			0.000
AR(1)	-1.235			0.438
AR(2)	1.101			0.624
Sargan	5.320			0.149

Source: Author's Computations, (2020).

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From the result presented in Table 16, the result diagnostics in the lower part of the Table indicate a Wald Chi-squared value of 261.26 with p-value of 0.000, which implies that the overall model is statistically significant and, hence, the model has a good fitness. The Arellano and Bond autocorrelation test in the first and second order (AR1 and AR2) show z-statistic values of -1.235 and 1.101 respectively, with respective p-values of 0.438 and 0.624. This indicates that the test null hypothesis of no autocorrelation in the first and second order could not be rejected and, hence, the model is free from autocorrelation problems. The Sargan test of over-identifying restriction shows a Chi-squared value of 0.520 with p-value of 0.149, indicating that the test null hypothesis of valid over-identifying restrictions could not be rejected and, hence, the restrictions placed on the instrument in order not to be over-identified are valid. The result of these diagnostics implies that this model is valid for relevant inference.

As for the result of the explanatory variables in the upper part of Table 16, the result shows that the coefficient of relational capital is significant at 1% significance level while age and ownership do not have significant impact on community performance of these universities. Relational capital has a positive coefficient. This indicates that increase in relational capital will result to a rise in community performance. With a positive coefficient of 0.199, a point increase in relational capital will induce an increase in the community performance of these universities by 0.199 points. Therefore, only relational capital has significant impact on community performance of the universities in the North-central region of Nigeria.

4.5 Discussion of Findings

The focus of this study is to provide evidence whether on the impact of relational capital on the performance in the NPUs using data from questionnaire and annual reports. Three sub-hypotheses developed to be tested using result of OLS and GMM obtained from the two sets respectively. The result of OLS regression analysis revealed a positive and significant relationship between relational and all three performances of public universities in Nigeria. Meanwhile, the findings from the result of system GMM revealed that relational capital had positive and significant relationship with teaching and community services performances only. Therefore, the two analyses had conflicting results with regards to research performance.

The positive significant relationship established between relational capital and teaching and community performance is in line with a prior expectation of this study. There two null hypotheses relating to the two performance shall be restated that relational capital significantly influence the teaching and community service performance of public universities in North central Nigeria. The conflicting results on research performance imply that the belief of academicians on how they relate with host communities differ from the implication from the records. This implies that the total amount of researches that won grant and total amount of researches done annually does not positively impact on the environment where the university is located. This is evident with many studies and researches that have been conducted in Nigeria but does not see the light of the day in terms of implementation.
The positive significant relationship between the relational capital and teaching and community service performance is supported with findings of numbers of previous studies such as Tumwine, Kamukamu and Ntayi (2012); Emmanuel (2012); Abdulai, Kwon and Moon (2012) Dorrego, Costa and Fernández (2013); Awais and Asad (2014); Datta and De

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(2017). The conclusion of this study also in line with conclusion of Cricelli *et al*, (2018) who said that different aspects of IC are associated with University performance. This was further corroborated by Khalique, Ramayah, Shah and Iqbal (2019) who confirmed that customer capital, social capital and technological capital which are the components of relational capital significant contributors in the intellectual capital model which in turn enhance the performance of the entity. However, none of the studies reviewed against the positive impact of the relational capital.

The stakeholders' theory advance supports of the findings in this study which inferred that there is a significant positive relationship between relational capital and university performance. The philosophy of the stakeholder's theory emphasises that all groups or individuals that may influence or have an effect on the organization's goals should work as a team in other to achieve success. The stakeholders recognised and enumerated by this theory include the media, the general public, competitors and non-governmental organisations etc. this implies that it is important to keep a cordial relationship with all those involved the education sector and interact to improve performance.

5. CONCLUSION AND RECOMMENDATION

Based on the findings obtained from all the above results, the following conclusions were drawn.

i. The study concluded that research performance is by relational capital of public universities in North central Nigeria
ii. Based on the findings on primary data, the study conclude that relationship existed among public universities in north central Nigeria and other universities outside the country, thus improving research performance.
iii. Regarding the result based on the records from annual reports, relational capital negatively impacting on research performance of public universities in north central Nigeria.
iv. The conclusion was also drawn that teaching performance was influenced by relational capital. The evidence was provided by the members of staff and the records from the annual reports of the NPUs.
v. It was also concluded that relational capital is capable of influencing the community service performance.

In line with the aforementioned conclusions made from the findings of this study, the following recommendations were made also made:

i. It is, therefore, recommended since it is not the sheer number of research works by various staff that is critically important to research performance; emphasis should be on the quality and relevance of the research to immediate environments.
ii. Even though there were contradictory conclusions from both the questionnaires served on staff and the data from annual reports regarding the influence of relational capital on research performance, however, the study recommends that staff should be countenanced and greedily exploited by universities.
iii. The fact that teaching performance was positively influenced by relational capital informs the recommendation that all avenues for cross-university linkages and

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collaboration should generally be pursued by the public universities in North central Nigeria.

iv. Based on the conclusion on community service performance and relational capital, this study highly recommend that no efforts should be spared in fostering collaborations with the industries and host communities with a view to improving national development.

It is believed that a study of this nature contribute positively to knowledge and practice as regards the relevance of relational capital on performance of Nigerian public universities in north central Nigeria. The university's performance has not been considered under research, teaching, community service performance in the previous studies in Nigeria. However, it is suggested that a replication of this study can be made on a nationwide scale with view of using large scale of data to shed additional insights on the overall performance of Nigerian public universities.

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