INFORMATION AND COMMUNICATION TECHNOLOGY APPLICATIONS AND SERVICE QUALITY OF FEDERAL UNIVERSITIES IN NIGERIA

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ABSTRACT: *The study examined the correlation between information and communication technology applications and service quality in federal universities in Nigeria. In line with the objectives of the study, three null hypotheses were formulated to guide the research. The theoretical foundation is on the resource-based theory which emphasises the role of organisations' resources as a foundation for its strategy. The study adopted the descriptive survey research design. The population size was six hundred and fifty-five Senate members from the five federal universities in Nigeria. A sample size of 250 university senate members was used while sample size for the study was statistically calculated using Taro Yamane formula. A purposive random sampling technique was further used to distribute the sample size across the five federal universities selected. A structured questionnaire based on the five-point Likert scale was used in data collection. Frequency tables were used in analysing both the demographic data of the respondents and to answer research questions, while Kendall tau_b was employed in testing the three hypotheses formulated. All the null hypotheses formulated were rejected. The findings, therefore, revealed that; a significant relationship exists between web portal services and academic performance in universities, e-registration significantly affects academic performance in universities and a significant relationship exist between e-learning and academic performance in universities in Nigeria. Also, it was agreed by the university senate that e-registration is effectively used to reduce the time spent on the registration and payment of fees, maintains efficient database of students' payments, and helps to speed up students' payment and registration process, students are now able to access materials for study through the internet, and that the web portal services of their institution has enhanced the academic learning processes of students. It was concluded that it enables students to register from any location, improves the efficiency of data captures and saves time, minimises error and can allow extended periods of registration; it is cost efficient and self-sustaining. It was, therefore, recommended amongst others that, E-registration should be highly encouraged and embraced by universities, as it enhances the academic performance of students, and E-learning should be practised by both teaching staff and students as to enhance learning, as well as to encourage the use of information technology in Universities.*

KEYWORDS: Information Communication Technology; Service Quality; marketing; academic performance

INTRODUCTION

Information Technology has revolutionised the world; it has changed the way societies work, do business, learn, train and even entertain. It is important to understand and underline the critical roles played by information technology (IT) in driving and shaping societies today, and in determining its future. The importance of Information and Communication Technology (ICT) in

the marketing of education has been highlighted.

Nwabueze and Ozioko (2011) observed that the development of any nation can be measured by the degree and extent of the socio-cultural, socioeconomic and political improvement that are brought to bear through the application of science and technology. Education, on the other hand, is fundamental to the development of a dynamic workforce capable of accessing and integrating knowledge into social and economic activities and participating in today's global economy (World Bank Report, 2003). OECD (1996) refers to these as the "knowledge-based economy" which gives a fuller recognition of the place of knowledge and technology in the global economy.In Nigeria, a significant milestone in the development of information technology was the formulation of a National Information Technology Policy (NITP) in March 2001 which was geared towards the promotion of growth and development in the IT industry (Nwabueze and Ozioko, 2011). It was reported by Nwabueze and Ozioko (2011) that the vision of Nigeria's IT policy is to make it an IT-capable country in Africa and a key player in the information society by the year 2015.

The National Universities Commission (NUC), the government agency responsible for registering and regulating universities had prescribed personal computer (PC) ownership for universities as follows: one to every four students, one personal computer (PC) to every two lecturers below the grade of Lecturer 1, one personal computer(PC) per senior lecturer and a notebook per Professor/Reader (Agyeman, 2007).Many universities in Nigeria have hardly met this target.
Information Technology is used to improve productivity through improved service quality, cost efficiency, revenue effectiveness and capacity utilisation (Kowalkowski, 2008). Information technology is defined as consisting of hardware, software, networks and media for collection, storage, processing, transmission and presentation of information (voice, data, text, and image). Education, especially at the tertiary level, has long been linked to commercial services (Rasul and Sahu 2011), opined that managers of higher education should necessarily consider students as their primary customers. They concluded that there is a direct relationship between service quality and customer satisfaction in the Universities. However, there seems to be a paucity of studies on service quality in public institutions in Nigeria as the focus is mostly on firms and SMEs. Therefore the major objective of this research is to examine how the application and usage of information and communication technology relate to service quality in Federal Universities in the South-East zone of Nigeria.

Statement of the problem
Wendy (2004) after reviewing the quality of service rendered by public institutions in Nigeria concluded that service firms are not serving people well. They are inaccessible; provide poor quality service and indifferent to customer needs. Obriki (2012) avers that corruption and service failure in Nigerian universities are responsible for the poor quality of graduates produced by higher institutions of learning in the country. He identifies an 'ideal academic environment as one where students are given efficient services (empathy, ease of use, information quality and accessibility) that enable them to build a positive mindset which will help them intervene and contribute to national growth and development'.

Several researchers have found that information technology presence and intensity can predict higher productivity and profits on hotel performance, service delivery and customer satisfaction

(Yousaf and Steen, 2011). Musa et al., (2010) also concluded that information technology has enhanced the quality of service of firms in Nigeria's construction industry.

In the light of the above, it is likely that the benefits of the application of information and communication technology in the marketing of services could also improve the quality of educational services, especially at the tertiary level. Incidentally, empirical literature in the area of information and communication technology application in tertiary institutions in Nigeria is very scanty as this has not been extensively researched. As a result there is a knowledge gap in literature which needs to be filled. Firdaus (2006) carried out a study on Measuring Service Quality in Higher Education using e-registration and e-learning, the researchers thus intends to build on this framework by introducing the web portal base dimension in filling the gap in literature.
It is against this backdrop that the researchers intend to investigate information and communication technology application and service quality in federal universities in the south-east zone of Nigeria.

Objectives of the Study
The main purpose of this study is to examine the effect of information and communication technology application on the service quality of universities in Nigeria. The study specifically addressed the following sub-objectives:
(i)   To examine the influence of web portal on academic performance of federal universities in Nigeria,
(ii)   To determine the effect of e-registration on academic performance of federal universities in Nigeria,
(iii)   To examine the effect of e-learning on academic performance of federal universities in Nigeria.

Research Questions
To guide the study, the following research questions were asked;
i.)   To what extent does web portal affect academic performance of federal Universities in Nigeria?
ii.)   To what extent does e-registration enhance academic performance of federal Universities in Nigeria?
iii.)   What is the relationship between e-learning and academic performance of federal Universities in Nigeria?

Research Hypotheses
Based on the research framework, the following hypotheses are formulated.
Ho_1: There is no significant relationship between web portal services and academic performance of federal universities in Nigeria
Ho_2: There is no significant relationship between e-registration and academic performance of federal universities in Nigeria
Ho_3:   There is no significant relationship between e-learning and academic performance in federal universities in Nigeria.

REVIEW OF RELEVANT LITERATURE

Information Technology Applications
Patil (2009) explains that the concept of information is associated with knowledge derived from study, experience or instruction. This can otherwise be interpreted by saying knowledge can be

acquired through education. Technology, on the other hand, he argues 'refers to the application of knowledge to practical aims of human life or to changing and manipulating the human environment.

Information technology has been defined as "the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware" (ITAA, 2005). Information technology is the capability to electronically input, process, store, and output, transmit and receive data and information including text, graphics sound and video as well as the ability to control machines of all kinds electronically (Patil, 2009). Cook (2008) in explaining information technology application advocated a four-category classification model make up of communication which refers to platforms that allow people to converse with others, either by text, image, voice or video or a combination of these. Secondly,cooperationrelates to showing software which enables people to share contents in structured and unstructured ways. While collaboration refers to tools that encourage people organisations to work with each other to solve problems. Furthermore, connections are networking technologies that make connections between people and content possible. These explain how computer applications are used to foster communication, cooperation, collaboration and connections between individual and organisation and vice versa.

The Influence of Information Technology on Education
To underscore the importance of information technology in education, UNESCO and several other world agencies in June 2004 formed 'the Partnership on Measuring ICT for development'. It further went on to define a core list of indicators for measuring the impact of IT on education. These basic lists of indicators are referred to as information communication technology (ICT) in education concepts which focus on the primary and secondary impacts of ICT on Educational management and policies, ICT use in education (students and teachers), ICT infrastructure access and ICT support. As earlier stated, Millennium Development Goals (MDGs) have been adopted by the United Nations as the key development targets for the first part of the 21st century. Improvement in education and increased access to Information Communication Technology (ICT) are two prominent objectives of these internationally supported MDGs.

Condie and Munro (2007) in their study of the impact of ICT on the school sector in the United Kingdom also focused on examining the infrastructure to support the use of ICT, the impact on learning and teaching as well as on the extent to which ICT support communication within the school and with the wider community. They further stated that only the existence of a school level e-strategy could address future development and sustainability can lead to efficient use of ICT in education. Having pointed out the general agreement by international agencies as per the catalytic effect of ICTs on schools. Condie and Munro (2007) concludes that evidence of the impact on learning, teaching and the management process indicates that, where the use of ICT is most effective in enhancing the learning experience, teachers and school management have been able to integrate a number of Information Technology (IT) applications such as laptops, interactive whiteboard and the internet. These combined with hardware, software and connectivity allow for the development of innovative approaches to learning and teaching. These studies emphasise the importance of Information Technology in improving educational services and therefore provide the impetus for us to assess how the said information technology has affected service quality of

Universities in Nigeria.

The Concept of Service Quality
In Parasuraman et al., (1985), Lewis and Booms defined service quality as a

"Measure of how well the service level delivered matched customer expectation. Delivering quality service means conforming to customer expectations on a consistent basis ".
Parasuraman *et.al* (1985) further explains that quality evaluation involves both looking at outcomes and processes that lead to the outcome. Different researchers identify several types of service quality. Technical and functional quality, physical, cooperate, and interactive quality are various classifications of service quality. Parasuraman *et al* (1985) also came up with determinants of service quality which are Access, communication, competence, courtesy, credibility reliability, responsiveness, security, tangibles and understanding/knowing the customer.

Firdaus (2006) avers that service quality has since emerged as a pervasive strategic force and a key strategic issue in management agenda. He identifies various instruments used in measuring service quality in the last decade ranging from SERVQUAL (Parasuraman*et. al,* 1988) SERVPERF to evaluated performance (EP). SERVQUAL operationalizes service quality by comparing the perceptions of the service received with expectations while SERVPERF maintains only the perception of service quality (Firdaus 2006). On the other hand, EP scales measure the gap between perceived performance and the ideal amount of a feature rather than the customer's expectations.

Firdaus (2006) while relating service quality to higher education states that student experience in a tertiary education institution should be the fundamental issue of which performance indicators need to address. Therefore critical factors of service quality should be determined from the standpoint of students being the primary customers. He proposed the HEdPERF (Higher Education Performance-only) which is a performance-based measuring instrument that attempts to capture the authentic determinants of services quality within higher education sector.

Academic Performance
Cretsinger (2003) believes that academic competition is impacting the students in all educational systems. This brings about pressure in three different areas of focus namely
(1)   Real competition, which means the competition between peers
(2)   Perceived competition, which refers to the competition a person believes is occurring between themselves and others.
(3)   Self-competition, which refres to the way a person continuously pressures himself to become better than others.

He further stated that the pressure to succeed academically has driven students to commit academic dishonesty. The aim of this study is to examine the correlation between application of information technology and student's academic performance. Academic performance is the extent to which a student has achieved his or her educational goals. Kuncel *et.al* (2004) carried out a research to establish the degree to which general cognitive ability can predict academic and job performance. Their findings, however, contradicted the notion that intelligence at work is wholly different from

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intelligence at school thereby extending the volumes of literature that support the immense importance of general cognitive ability.

Furthermore, various developed countries have devised ways of measuring Academic performance. The state of California in the United States of America uses the Academic performance index (API) and also identified individual differences and parents academic socialisation as major factors influencing students' academic performance.

Information Technology Application and Service Quality

A plethora of research have been carried out in the area of information technology adoption, diffusion and usage. These studies cut across a wide variety of sectors and industries. These include information technology adoption in Academic, Health Centers, and in Emerging Economies (Qureshi and Vogel, 2005). Awa et al., (2012) reviewed and synthesised the constructs of different adoption and diffusion models by integrating the construction company mission, individual difference factors, perceived trust, and perceived service quality to improve existing knowledge of electronic commerce acceptance and provide the basis for informed decisions.

Buabeng-Andoh (2012) opined that global investment in ICT to improve education in many countries has been huge. However, ICT adoption, and integration in teaching and learning have been limited. He identifies lack of teacher ICT skills, limited access to ICT, rigid structure of traditional education system, restrictive curricula as major barriers.Egwuonwu (2012) focused on the impact of ICT education on SME's adoption and use of ICT. The study carried out in the Northern part of Nigeria showed that the low educational capabilities of entrepreneurs significantly affects their approval and use of the internet as they preferred to use cell phones as their mode of communication.Iwasokun(2012) statistically evaluated the impact of ICT on Nigerian Universities by analysing four factors namely communication and feedback, study aid, processing and administration as well as management and relationships. However, they were unable to research such performance indices as the impact of ICT on students' assessment and grading, adequacy of the university curriculum on ICT based courses. These gaps are expected to be covered by our current efforts.

Rasul and Sahu (2011) examined the use of IT and its impact on service quality in an academic library. They defined library service quality as the difference between user expectations and perceptions of service performance. Their findings showed that the overall assessment of service quality and user satisfaction is moderate indicating wide scope for improvement .it was also found that adequacy of print resource, electronic resources and IT service are especially low. From the prior reviews, various service quality models have been adopted in different sectors of the economy. The impact of the use and application of service quality on banking service, health care, library service, quantity surveying, education and so on have all been paid attention. Adoption and diffusion of information Technology by SME$_S$, at a sound level, were also reviewed.

Web Portal/Sites and Service Quality

A web portal is a website that brings information together from diverse sources in a uniform way. Apart from the standard search engines feature, web portal offers another service such as e-mail, news, information, data bases and entertainment

Ivan (2012) adds that internet portals can be seen as gateways to information and services provided on the web. He further identified web portal properties to include Mission, Depth of content and Target users. He further splits portals into two groups namely transaction-based internet portals (mission is to make a profit) and the information-based portals (mission is to distribute information).

Ivan (2012) examined measurements for information-based portal service and found out that customers are most satisfied with the quality of information provided on faculty/University web portals and are least satisfied with web design.

Kuo and Chen(2005) avers that to deliver superior quality service, managers of companies with web presences must first understand how customers perceive and evaluate online services. They, therefore, used the SERVQUAL model to analyse user-perceived Portal quality and found out customer satisfaction is related to four factors namely Empathy, Ease of use, Information quality and Accessibility

Zeithaml *et. al.,* (2002) had already stated that evidence exists that service quality delivery through Web sites is an essential strategy to success, possibly more important than low price and Web presence. In their study of perceived web portal service quality, they conclude that e-service quality is multifaceted and include dimensions such as ease of use, privacy/confidentiality, reliability and site design. Also, that Empathy (personal service) seems to be an important dimension for service recovery not as a core dimension of a core service.

E-Registration/Payments and Service Quality
Amaral (2007) reveals that in the academic world quality assessment has traditionally assumed two major objectives namely quality improvement and accountability. Universities mostly strive for quality improvement in terms academic and administrative service delivery. However, governments and regulatory bodies pay special attention to accountability aiming at providing quality service.

E-registration/payments otherwise called on-line registration/payments came up due to the need to minimise paper-based transactions and to improve the accuracy of operations (Djoleto, 2008). His work found out that the use of e-business solutions such as e-payments and registration led to increased enrolments, efficiency (i.e. reduction of paperwork), effectiveness in tuition and bills payments as well as flexibility in events scheduling, Kalakota and Robinson (2000) cited in Djoleto (2008) defined e-registration/payment as the execution of transactions between two or more parties using interconnected networks

Iwasokun (2012) reported that Adeyegbe while accessing the e-registration in the education institutions said that Information Technology holds immense effectiveness and efficiency. He opines that information Technology has been applied to streamline the educational testing process in the following areas: Registration Data capture, Item banking and analysis, online assessment (computerised Test Administration), Electronic marking and Results checking/verification.
The benefits of e-registration include that it enables students to register from any location, enhances the efficiency of data captures and saves time, it minimises error, and it can allow

extended periods of registration, it is cost efficient and self-sustaining. Finally, it adds values to services provided by the school as stakeholders are encouraged to acquire it skills.

In Olasina (2007), Strauss said that electronic registration, e-registration, web-based registration or even online registration is a secure website that students enter to indicate that they will attend classes in the upcoming session.

To highlight the growing importance of IT, the National Universities Commission (2015) and other international bodies in tertiary education have come up with the Webometrics of universities across the world to highlight the growing importance of the web to the running and administration of universities. Olasina (2009) examine the acceptance and use of e-registration at Ladoke Akintola University of Technology (LAUTECH) Ogbomoso, Nigeria. He found out that there is a high perception of the use of e-registration by users, but this can be complemented by the provision of institutional access to the internet for the students and a whole lot more of a feature such as access to the portal to results, chat facility.

Electronic payment systems according to Kazeem (2012) refers to payments that are completed using some form of electronic communication with a range of payments instruments such as debit and credit cards, internet payments, direct debiting of accounts and the use of mobile phones or set-top boxes

E-Learning and Service Quality

OECD (2005) in a policy brief on e-learning in tertiary education asserted that e-learning is becoming increasingly prominent in tertiary education, with universities increasing provision and more students signing up. E-learning is changing teaching and learning.They defined e-learning as the use of information and communication technology (ICT) to enhance and support learning. Oliver (2005) cited in the TDU (2012) quality framework for e-learning explain the "quality agenda" in the following terms.

"As more and more universities seek to use e-learning as a mode of delivery for their units and courses and as more and more they are being held accountable for the quality of the service they provide; the need grows for accepted standard and benchmarks against which performance can be judged".

The TDU (2012) outlines three basic e-learning framework which consists of Basic standard (which consists of organisation and appearance, consistency and compliance, appropriate use of tools, and learning resources and supports), Staff development Tool kit and Advance standards

Barker (2002) describes the term e-learning as using both a computer and the internet to learn. The document comprehensively describes the quality framework for e-learning in Canada regarding Quality outcome from e-learning product and services Quality processes and practices of e-learning products and services as well as Quality input and resources for e-learning products and services.

Agariya and Singh (2012) tried to develop a reliable and valid e-learning framework or quality measurement scale from the learning as well as faculty perspectives in the Indian context. They

found that e-learning quality is a multidimensional construct and serves as a critical success factor. In India, efficiency and effectiveness of e-learning practices will enhance economic development.

THEORETICAL FOUNDATION

This study is based on the resource-based theory which emphasises the role of organisations resources as a foundation for its strategy. The theory explores the relationships between resources, capabilities, competition and profitability (David and Teece, 1988). Grant (1991) examine the resources based theory about the appropriateness of returns on innovation such as technology.

The study further draws from the various adoption and diffusion of Innovation theories such as the technology acceptance model (TAM) developed by Davis in 1989 which is an information systems theory which explains how people come to accept and use technology. The model identified perceived usefulness (PU) and perceived ease of use (PEOU) as the two major influences of technology adoption.

The technology acceptance model (TAM) is one of the most important extensions of the theory of reasoned action (TRA) developed by Martin Fishbein and leek Arzen (1975, 1980). This theory is a model for prediction of behavioural intention in the prediction of attitude and behaviour (Ajzen, 1991). The theory of reasoned action (TRA) composes of three general constructs namely behavioural intention (BI), attitude (A) and Subjective Norm (SN) (Fishbein and Ajzen, 1991). Other theories of adoption include the Theory of Planned Behavior (TPB) which is essentially an extension of the theory of Reasoned Action (TRA) that includes additional measures of control beliefs and perceived behavioural control (PBC) to its other constructs (Armittage and Connor, 2001).
Oliveria and Martins (2011) also studied IT adoption models at firm level by relying on two prominent models namely the diffusion of innovation (DOI) theory, and the technology, organisation and environment (TOE) framework. The Technology, Organization, Environment (TOE) framework (Tornatzty and Fleischer 1990) suggests that adoption is influenced by technological development, organisational contexts and the industrial environment. TAM proposed perceived usefulness (PU) and perceived ease of use (PEOU) as fundamental determinants of IT adoption (Oliveria and Martins, 2011)

Other theoretical foundations used to explain Information Technology acceptance and utilisation is the technology adoption model (TAM) which posits that perceived usefulness and perceived ease of use are major determinants of IT usage (Amoako-Gyampah and Sala 2003). The study evaluated the impact of one belief construct (shared beliefs in the benefits of technology) and two widely recognised technology implementation success factors (training and communication) on perceived usefulness and perceived ease of use during technology implementation. Their study further provided empirical and theoretical support for the use of managerial interventions such as training and communication to influence acceptance of technology,

Review of Empirical Studies
Olaniyi (2012), in a study entitled "the diffusion of information and communication technology in primary schools in Nigeria; critically examine the efforts of the Nigerian government to integrate information and communication technology (ICT) into education. The study aim was to; assess

the availability of ICT facilities and infrastructure; investigate whether students have the skill needed for ICT utilisation and also assessed the factors that affect the diffusion of ICT in education. The study was geared towards providing practical information to the extent of achieving the vision and objectives of the national policy for ICT in Nigeria. The study adopted the exploratory research design. One way analysis of variance (ANOVA) was employed in the statistical analysis. The analysis revealed that information and communication technology (ICT) was not universally available. It was also found that internet services are not fully provided in all government institutions in Nigeria. One of the most important recommendations that emerged from the study was the need to provide information and communication technology to all public institutions in Nigeria.

In another study conducted by Atsumbe et. al., (2012) on availability and utilisation of e-learning infrastructures in Federal University of Technology Mina, the study was carried out to determine the level of ICT implementation in the Federal University of Technology Mina. The study used the survey design and data obtained from the study was analysed using mean and t-test. It was found that e-learning infrastructures are not adequate in the university for teaching and learning and management's efforts towards the development of information and communication technology (ICT) is mainly for administrative purposes.

It was also found that lecturers and students alike have computer and laptops and can access the internet but, they do not use them for teaching and learning. Based on the findings of the study, e-learning infrastructures was recommended to boost education and to learn in the university. The study also recommended in-house training for lecturers on the use of ICT for teaching and learning.

In a separate study Etim et. al., (2012) investigated the adoption of information and communication technology (ICT) and higher education; the study was conducted in four universities in Nigeria namely; University of Lagos, Cross Rivers University of Technology Calabar, Rivers State University of Technology, Port Harcourt and the American University of Nigeria, Yola Adamawa State. The study which was descriptive in nature also adopted the survey research design method. It was revealed that private university places greater emphasis on and has deployed ICTs more comprehensively than public universities. It was also found that public universities tend to pay more attention to administration than teaching and learning in their deployment of ICTs. The analysis also showed that only the private university demands laptop ownership - by staff and students – as a pre-requisite for adequate ICT deployment in teaching and learning. The study, therefore, recommended the deployment of information and communication technology in the area of higher education in Nigeria.

2.8 Study Variables and Research Framework
In this study, information communication technology application is our predictor variable while service quality in federal universities in Nigeria is our criterion variable. The attributes of these variables are E-registration, Web Portal Base, E-learning, and Academic performance respectively.

Research Framework
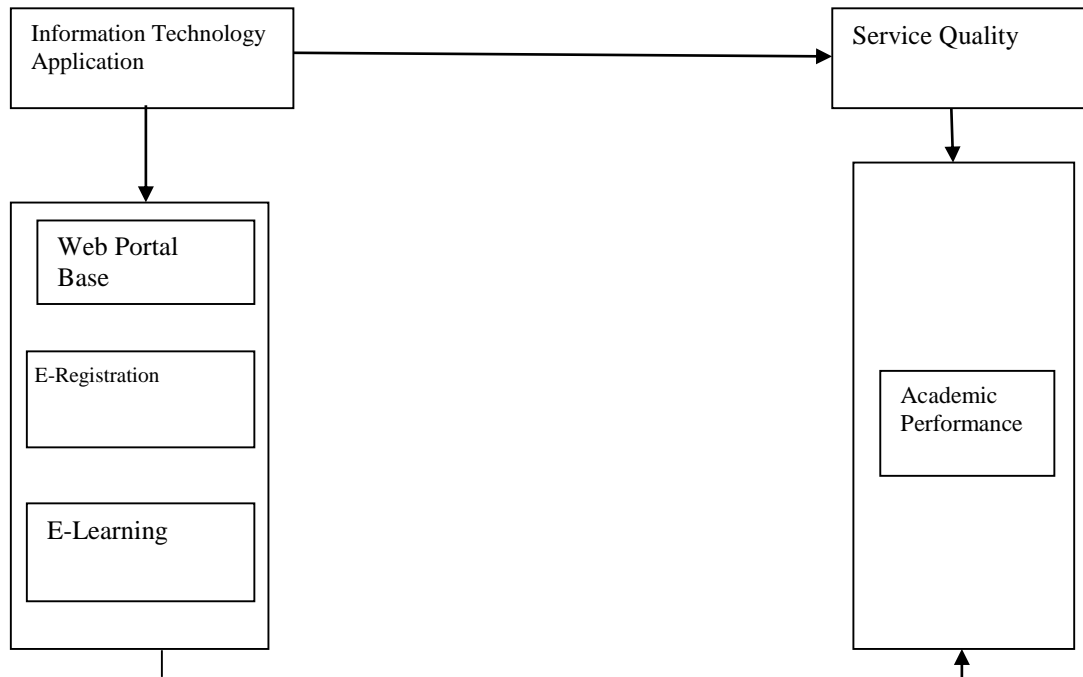
Fig. 1: Conceptual Framework of the Association between Information Technology Application and Service Quality.
Source: Adopted from Firdaus (2006) and Survey Data (2016).

RESEARCH METHODOLOGY

Research Design

This research study is a descriptive research study; this is informed by the type of phenomenon under study and also because the variables under study were not under the control of the researchers. Therefore the cross-sectional survey will provide us with the best opportunities in this study. The survey design offers a wide coverage and permits generalizability of research findings (Baridam 1999, and Ahiauzu, 2004).

This study focused on Senior Administrative officers of Federal Universities in the Nigeria. These includes; the University of Nigeria Nsukka in Enugu state, Micheal Okpara University of Agriculture Umudike in Abia state, Federal University of Technology Owerri in Imo state, Nnamdi Azikiwe University awka in Anambra state, and the Federal University of Ndufu-Alike Ikwo in Ebonyi.

The study further adopted a target and accessible population of members of the Senate of some Federal Government-owned Universities that are most likely to be more exposed to IT policy direction, compliance and performance and provides the necessary data.

These members of the Senate are Deans and Provosts, Professors, Heads of Departments, the senior management staff of the Information Communication Technology department as well as the Registrar. The major justification for selecting this population is that they are involved in policy making and also receive feedback from the system and are therefore very conversant with the issues at stake.

Population of the Study

One simple way to capture the concept of the population that all can relate to is the concept of the population from the perspective of demography (Onodugo et. al, 2010). The target population of interest estimated for this study is the entire members of Senate from five federal universities in Nigeria.This population according to the National University Commission(NUC, 2015) is six hundred and fifty-five Senate members from the five federal universities in Nigeria.

Table 1: Population Size

S/No	UNIVERSITY	DEANS/ PROVOST	PROFESSOR	HOD	SENIOR MANAGEMENT	ICT	TOTAL
1	University of Nigeria, Nsukka	22	80	46	12	10	170
2	Micheal Okpara University of Agriculture, Umudike	22	65	28	8	8	131
3	Federal University of Technology, Owerri	20	72	26	10	12	140
4	Nnamdi Azikiwe University, Awka	22	60	25	8	10	125
5	Federal University Ndufu-Alike: Ikwo	14	40	20	10	5	89
	Total	**100**	**317**	**145**	**48**	**45**	**655**

Source: NUC, 2015

Sample Size Determination

For the purpose of this research the target population was six hundred and fifty-five (655) senate members from the five federal universities in south-eastern zone of Nigeria. In order to arrive at an appropriate sample size, the Taro (1967) formula was employed, with 95% degree of freedom at 5% error tolerance. The sample size was calculated thus:

$$n = \frac{N}{1+N(e)^2}$$

n = Sample size

N = Population size

e = Level of significance

Applying the formula

$$n = \frac{655}{1+655(0.05)^2}$$

$$n = \frac{655}{1+ 655(0.0025)}$$

$$n = \frac{655}{2.6375}$$

n = 248.34

Approximately = 248

The sample size was, therefore, rounded off to 250, due to the large population size in the study.

Sampling Technique

A purposive random sampling technique was used in this study. At the second stage, fifty respondents were randomly selected from each of the five federal universities, making a total of two hundred and fifty (250) respondents as determined by the sample size above.

Analysis Technique

The mass of data collected from respondents on the field was subjected to series of treatment. They were presented, for simplicity, using appropriate tables, as well as texts. The SPSS (version 20) software package was used in analysing the statistics for the study. Frequency tables and percentages were used in analysing the demographic data of the respondents as well as research questions, while Kendall tau_b was employed in analyzing the hypotheses formulated. The questionnaire instrument was based on five-pointLikert scale, which is specified as follows; Strongly Agree (SA) = 5 point; Agree (A) = 4 points; Neutral (U) = 3 points, Disagree (D) = 2 points, and Strongly Disagree(SD)= 1

RESULTS/ FINDINGS

Out of the two hundred and fifty copies of questionnaires distributed, two hundred and ten (210) copies were returned filled. This represents 84% of the entire questionnaire distributed.

Demographic data of the respondents

Table 2: Percentage distribution of respondents by their Gender

	Frequency	Percent
MALE	150	71.4
FEMALE	60	28.6
Total	210	100.0

Source: SPSS Output, 2017

From the above table, 150 (71.4%) of the respondents were male Senate members of the selected universities, while 60 (28.6%) of them were females.

Table 3: Percentage distribution of respondents in the category of staff

	Frequency	Percent
ACADEMIC	130	61.9
NON-ACADEMIC	80	38.1
Total	210	100.0

Source: SPSS Output, 2017

From Table2, the result indicated that 130 (61.9%) of the respondents were the senior academic staff of the selected universities, while 80(38.1%) of them were senior administrative of non-teaching staff of the universities.

Table 4: Percentage distribution of respondents on their rating of the use of computer and information technology tools

	Frequency	Percent
VERY STRONGLY	60	28.6
STRONGLY	85	40.5
AVERAGE	50	23.8
LESS THAN AVERAGE	15	7.1
Total	210	100.0

Source: SPSS Output, 2017

From the Table above, 60(28.6%) of the respondents rated the use of computer and information tools very strongly, 85(40.5%) of them rated strongly, 50 (23.8%) of them rated average, while 15(7.1%) of the respondents had less than average on the rating of the use of computer and information technology tools in universities.

Table 5: Percentage distribution of respondents on the services provided to students by teaching and non-teaching staff

	Frequency	Percent
E-registration	90	42.9
E-learning	45	21.4
E-payment	55	26.2
Computer-based Test	15	7.1
Web Portal	5	2.4
Total	210	100.0

Source: SPSS Output, 2017

From the above table, 90(42.9%) of the respondents agreed that E-registration is provided for students, 45(21.4%) of them agreed on E-learning, 55(26.2%) of them agreed on E-payment, 15(7.1%) of them agreed on computer-based test, while 5(2.4%) of the respondents agreed on web portal as the services provided by teaching and non-teaching staff to university students.

Table 6: Percentage response of Senate members on E-registration

S/N	QUESTIONS	SA/A	%	N	%	D/SD	%	Total
Part I: E-registration/ Payment								
1.	E-Registration is now effectively used to reduce the time spent on registration.	110	53.38	55	26.19	45	21.43	210
2.	E-registration enables the school to maintain an efficient data base of student's payments and credential records.	115	54.76	60	28.57	35	16.67	210
3.	Online registrations help to speed up student's registration process as data are automatically documented.	118	56.19	68	32.38	24	11.43	210

The findings in the above table shows that the aggregate response of strongly agree (SA), and Agree (A) for the three questionnaire items is (343) 54.44% 183 (29.05%) indicated Neutral (N), while104 (16.51%) indicated Disagree (D) and strongly disagree (SD).This indicates that more than 50% of the Senate members support the use of e-registration by students. Therefore, it was agreed that e-registration are effectively used to reduce the time spent bt students on their registration, maintains an efficient data base of students' payments, and helps to speed up students' payment and registration process. Djoleto (2008) in his work found out that the use of e-business solutions such as e-payments and registration led to increased enrolments, efficiency (i.e. reduction of paperwork), effectiveness in tuition and bills payments as well as flexibility in events scheduling, Kalakota and Robinson (2000) cited in Djoleto (2008) defined e-registration as the execution of transactions between two or more parties using interconnected networks. This assertion agrees with the findings of this study on e-registration in universities.

Table 7: Percentage response of Senate members on E-learning

S/N	QUESTIONS	SA/A	%	N	%	D/SD	%	Total
	Part II: E-learning							
4.	Students are now exchanging communication, learning and assignments with lecturers and administrative staff through the internet.	120	57.14	65	30.95	25	11.91	210
5.	Students are now able to access materials for study through the internet.	130	61.91	60	28.57	20	9.52	210
6	The web portal services of this institution has enhanced the academic learning processes of students	115	54.76	70	33.33	25	11.91	210

The findings in the above table shows that the aggregate response of strongly agree (SA), and Agree (A) for the three questionnaire items is (365) 57.94% 195 (30.95%) indicated Neutral (N), while70 (11.11%) indicated Disagree (D) and strongly disagree (SD).This shows that more than 50% of the Senate members were in agreement of e-learning by students. Therefore, it was agreed

that students are now able to access materials for study through the internet and that the web portal services of their institution have enhanced the academic learning processes of students. OECD (2005) in a policy brief on e-learning in tertiary education asserted that e-learning is becoming increasingly prominent in tertiary education, with universities increasing provision and more students signing up. This brief confirms to what is ongoing in the universities in Nigeria

Table 8: Percentage response of Senate members on Computer based test

S/N	QUESTIONS	SA/A	%	N	%	D/SD	%	Total
	Part III: Computer Based Test							
7	Computer-based tests have been found to deliver consistently and accurate results acceptable by Students majority.	116	55.24	76	36.19	18	8.57	210
8	The computer-based test has enhanced the selection process of the school, thereby making admission accurate and	120	57.14	77	36.67	13	6.19	210
9	The computer-based test has made it possible for our school to check the increasing irregularities in student tests and	130	61.91	35	16.67	45	21.43	210

The findings in the above table shows that the aggregate response of strongly agree (SA), and Agree (A) for the three questionnaire items is (366) 58.10% 188 (29.84%) indicated Neutral (N), while76 (12.06%) indicated Disagree (D) and strongly disagree (SD).This shows that more than 50% of the Senate members were in agreement with the importance of information for students'computer-based test. Therefore, it was agreed that computer-based tests had been found to deliver consistent and trustworthy results acceptable by students, has enhanced the selection process of the school, thereby making admission worthwhile, and has made it possible for their school to check the increasing irregularities in students. OECD (2005) in a policy brief on e-learning in tertiary education asserted that e-learning is becoming increasingly prominent in tertiary education, with universities increasing provision and more students signing up. This brief confirms to what is ongoing in the universities in Nigeria.

Table 9: Percentage response of Senate members on Academic Performance

S/N	QUESTIONS	SA/A	%	N	%	D/SD	%	Total
	PART IV: Academic Performance							
10	E-registration can impact positively in improving students grades and performance	125	59.52	75	35.71	10	4.76	210
11	Computer-based tests has led to students improving their academic grades and performance, in their course of study	128	60.95	65	30.95	17	8.10	210
12	The web portal services of my institution enhance the teaching and learning supports and thus, improves student academic performance	119	56.67	55	26.19	36	17.14	210

The findings in the above table shows that the aggregate response of strongly agree (SA), and Agree (A) for the three questionnaire items is (372) 59.05% 195(30.95%) indicated Neutral (N), while63 (10%) indicated Disagree (D) and strongly disagree (SD).This indicates that more than 50% of the Senate members were in agreement with the importance of information technology for students' academic performance. Therefore, it was agreed that e-registration could impact positively in improving students grades, computer based tests have led students toenhance their grades in the cause of their study, and the web portal services of their institution enhance the teaching and learning supports, thereby improving students academic output. Kuncel *et al.,* (2004) carried out research to establish if the general cognitive ability was a correct measure for predicting academic performance and job performance. Their findings, however, contradicted the notion that intelligence at work is wholly different from intelligence at school thereby extending the volumes of literature that support the immense importance of general cognitive ability. This is true and can be further enhanced with the use of information technology by the students, as pointed out in the present study.

Hypotheses Testing

Ho[1]: There is no significant relationship between web portal services and academic performance in federal universities in Nigeria

Table 10: Kendall's tau_b Tests Output

Correlations

			Web Portal	Academic Performance
Kendall's tau_b	Web Portal	Correlation Coefficient	1.000	.717[**]
		Sig. (2-tailed)	.	.000
		N	210	210
	Academic Performance	Correlation Coefficient	.717[**]	1.000
		Sig. (2-tailed)	.000	.
		N	2100	210

[**]. Correlation is significant at the 0.05 level (2-tailed).

Source: Author's calculations 2017

From the result of the above table, the correlation coefficient (r = 0.717) between web portal services and academic performance in federal universities in Nigeria is strong and positive. The coefficient of determination (r^2 = 0.51) indicates that 51% academic performance in universities in Nigeria can be explained by web portal services. The significant value of 0.000 (p< 0.05) reveals a significant relationship. Based on that, the null hypothesis was rejected. Therefore, there is a significant relationship between web portal services and academic performance in federal universities in Nigeria.

Ho2:   There is no significant relationship between e-registration and academic performance in fedearl universities in Nigeria

Table 11: Kendall's tau_b Tests Output

Correlations

			E-registration	Academic Performance
Kendall's tau_b	E-registration	Correlation Coefficient	1.000	.642[**]
		Sig. (2-tailed)	.	.000
		N	210	210
	Academic Performance	Correlation Coefficient	.642[**]	1.000
		Sig. (2-tailed)	.000	.
		N	2100	210

[**]. Correlation is significant at the 0.05 level (2-tailed).

From the result of the above table, the correlation coefficient (r = 0.642) between e-registration and academic performance in universities in Nigeria is strong and positive. The coefficient of determination (r^2 = 0.41) indicates that 41% academic performance in universities in Nigeria can be explained by e-registration. The significant value of 0.000 (p< 0.05) reveals a significant relationship. Based on that, the null hypothesis was rejected. Therefore, e-registration significantly affects academic performance in federal universities in Nigeria.

Ho3:   There is no significant relationship between e-learning and academic performance in federal universities in Nigeria

Table 12: Kendall's tau_b Tests Output

Correlations

			E-learning	Academic Performance
Kendall's tau_b	E-learning	Correlation Coefficient	1.000	.722[**]
		Sig. (2-tailed)	.	.000
		N	210	210
	Academic Performance	Correlation Coefficient	.722[**]	1.000
		Sig. (2-tailed)	.000	.
		N	2100	210

[**]. Correlation is significant at the 0.05 level (2-tailed).

Source: Author's calculations 2016

From the result of the above table, the correlation coefficient (r = 0.722) between e-learning services and academic performance in universities in Nigeria is strong and positive. The coefficient

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of determination (r^2 = 0.52) indicates that 52% academic performance in universities in Nigeria can be explained by e-learning. The significance value of 0.000 ($p < 0.05$) reveals a significant relationship. Based on that, the null hypothesis was rejected. Therefore, there is a significant relationship between e-learning and academic performance in federal universities in Nigeria.

DISCUSSION OF FINDINGS

Web portal services and academic performance in universities

The study revealed a significant relationship between web portal services and academic performance in universities. This was validated by the fact that respondents agreed that e-registration can impact positively in improving students grades, computer based tests have led students improving their academic performance in the course of their study, and the web portal services of their institution enhances the teaching and learning supports, thereby improving students' academic output. Kuncel *et al* (2004) carried out a research to establish if general cognitive ability was a correct measure for predicting academic performance and job performance. Their findings however contradicted the notion that intelligence at work is wholly different from intelligence at school thereby extending the volumes of literature that supports the broad importance of general cognitive ability. This is true, and can be further enhanced with the use of information technology by the students, as pointed out in the present study.

E-registration and academic performance in universities
The study revealed that E-registration significantly affect academic performance in universities. This was validated by the fact that the respondents agreed that e-registration are effectively used to reduce the time spent in the registration and payment of fees, maintains efficient data base of students' payments, and helps to speed up students' payment and registration process. Djoleto (2008) in his work found out that the use of e-business solutions such as e-payments and registration led to increased enrolments, (i.e. reduction of paperwork), efficiency in tuition and bills payments as well as flexibility in events scheduling, Kalakota and Robinson in (Djoleto, 2008) defined e-registration/payment as the execution of transactions between two or more parties using interconnected networks. This assertion agrees with the findings of this study on the relationship between e-registration and academic performance in universities.

E-learning and academic performance in universities
The study revealed a significant relationship between e-learning and academic performance in universities. This was validated by the fact that respondents agreed that students are now able to access materials of study through the internet, and that the web portal services of their institution has enhanced the academic learning processes of students. OECD (2005) in a policy brief on e-learning in tertiary education asserted that e-learning is becoming increasingly prominent in tertiary education, with universities increasing provision and more students signing up. This brief confirms to what is ongoing of the federal universities in Nigeria.

CONCLUSION

Summary of Findings
(i)   There is a significant relationship between web portal services and academic performance of federal universities in Nigeria.
(ii)   E-registration significantly affects academic performance of federal universities in Nigeria
(iii)   There is a significant relationship between e-learning and academic performance of federal universities in Nigeria.

Future Research
- E-registration should be highly encouraged and embraced by universities, as it enhances academic performance of students.
- E-learning should be practiced by both academic staff and students as to enhance learning, as this will encourage the use of information technology in Universities.
- University management should pay particular attention to its web sites as the study revealed a very strong impact on students' perception of their service quality. Issues such as ease and speed of use, privacy, responsiveness and reliability of websites should be of paramount importance
- Universities should improve the information and communication technology compliance of their top management to at least 95 percent to ensure policy makers understand the direction and impact   of these policies.
- Computer based exams should be initiated in degree exams, to make the use of ICT more effective in universities.
- Lecturers should always be encouraged to supervise their students' projects/thesis through emails, as this will enhance the use of ICT among students and lecturers.

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