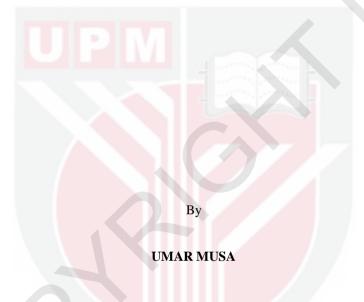*INFLUENCE OF SELECTED FACTORS ON ICT USAGE AMONG EDUCATION COLLEGE LECTURERS IN KANO STATE, NIGERIA*

**UMAR MUSA**

**FPP 2020 10**

**INFLUENCE OF SELECTED FACTORS ON ICT USAGE AMONG EDUCATION COLLEGE LECTURERS IN KANO STATE, NIGERIA**

By

**UMAR MUSA**

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy**

**October 2019**

# INFLUENCE OF SELECTED FACTORS ON ICT USAGE AMONG EDUCATION COLLEGE LECTURERS IN KANO STATE, NIGERIA

By

**UMAR MUSA**

**October 2019**

**Chairman  : Associate Professor Habibah Ab Jalil, PhD**
**Faculty    : Educational Studies**

Nigerian studies confirms that ICT lecturers in the country have low levels of ICT usage due to a lack of computers in the departments and inaccessibility to the Internet. Furthermore, poor information infrastructure accounts for low ICT development and application. Although a few studies have focused on selected factors of ICT usage, not much is known about the extent of ICT usage. This study determined the level of ICT usage and selected factors of ICT usage, such as Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), Technological Pedagogical Content Knowledge (TPACK), and attitudes towards ICT (ATTIC).

The study is a quantitative descriptive research. The research instrument was a set of questionnaires—the population of the study comprised 1775 college lecturers in Kano State, Nigeria. The minimum sample size for this study was 232 lecturers. The respondents were selected based on a proportionate stratified random sampling technique. The data was collected using an adapted questionnaire containing the respondent profile, ICT usage, and the six selected factors above. Descriptive statistics, including frequencies, percentages, mean, and standard deviation were applied to describe the respondent profile and their ICT usage level, as well as and the related factors of ICT usage. Meanwhile, inferential statistics including Analysis of Variance (ANOVA), correlation analysis, and logistic regression were employed to compare the mean scores, to determine the relationship between the variables, and to identify the extent of the influencing factors of ICT usage.

The findings revealed that more than half of the lecturers had a low ICT usage level; therefore, relevant stakeholders are recommended to take all the possible means to improve ICT usage among Kano State lecturers, as this action could eventually impact the teaching and learning processes in various institutions in Nigeria. This step should

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be done while considering the factors that relate to the ICT usage of the lecturers surveyed in this study.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**PENGARUH FAKTOR-FAKTOR TERPILIH DALAM PENGGUNAAN TEKNOLOGI MAKLUMAT DAN KOMUNIKASI (ICT) DI KALANGAN PENSYARAH KOLEJ PENDIDIKAN DI NEGERI KANO, NIGERIA**

Oleh

**UMAR MUSA**

**Oktober 2019**

**Pengerusi** : **Profesor Madya Habibah Ab Jalil, PhD**
**Fakulti** : **Pengajian Pendidikan**

Kajian di Nigeria mengesahkan bahawa pensyarah ICT di negara ini mempunyai tahap penggunaan ICT yang rendah kerana kekurangan komputer di jabatan-jabatan dan akses ke Internet. Tambahan pula, infrastruktur maklumat yang lemah menyumbang kepada pembangunan dan aplikasi ICT yang rendah. Walaupun beberapa kajian telah menumpukan pada faktor terpilih penggunaan ICT, namun masih tidak banyak yang diketahui mengenai sejauh mana penggunaan ICT berlaku. Kajian ini bertujuan menentukan tahap penggunaan ICT dan faktor terpilih dari penggunaan ICT, seperti Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), Technological Pedagogical Content Knowledge (TPACK), dan sikap terhadap ICT (ATTIC).

Kajian ini merupakan kajian deskriptif kuantitatif yang menggunakan satu set soal selidik. Populasi kajian ini terdiri daripada 1775 pensyarah kolej pendidikan di Kano State, Nigeria. Saiz sampel bagi kajian ini adalah 232 pensyarah. Responden dipilih berdasarkan teknik pensampelan rawak berstrata. Data dikumpulkan menggunakan soal selidik yang telah disesuaikan, yang mengandungi profil responden, penggunaan ICT, dan enam faktor yang dikenalpasti. Statistik deskriptif termasuk kekerapan, peratusan, min dan sisihan piawai digunakan untuk menggambarkan profil responden dan tahap penggunaan ICT dan factor-faktor yang berkaitan, manakala statistik inferens termasuk *Analysis of Variance* (ANOVA), analisis korelasi dan regresi logistik digunakan untuk membandingkan cara, menentukan hubungan dan faktor-faktor yang mempengaruhi untuk kegunaan ICT masing-masing.

Penemuan ini menunjukkan bahawa lebih daripada separuh daripada pensyarah mempunyai tahap penggunaan ICT yang rendah, oleh itu adalah dicadangkan bahawa

pihak berkepentingan yang relevan perlu memberi penekanan kepada semua cara yang mungkin untuk meningkatkan penggunaan ICT di kalangan pensyarah yang akhirnya memberi kesan kepada proses pengajaran dan pembelajaran di pelbagai institusi. Ini perlu dilakukan dengan mengambilkira faktor yang berkaitan dengan penggunaan ICT di kalangan pensyarah seperti yang diperolehi dari kajian ini.

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This thesis was submitted to the Senate of the Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the supervisory committee were as follows:

**Habibah Ab. Jalil, PhD**
Associate Professor
Faculty of Educational Studies
Universiti Putra Malaysia
(Chairman)

**Aminuddin bn Hassan, PhD**
Associate Professor
Faculty of Educational Studies
Universiti Putra Malaysia
(Member)

**Abdullah Mat Rashid, PhD**
Associate Professor
Faculty of Educational Studies
Universiti Putra Malaysia
(Member)

**ZALILAH MOHD SHARIFF, PhD**
Professor and Dean
School of Graduate Studies
Universiti Putra Malaysia

Date:

**Declaration by graduate student**

I hereby confirm that:
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Signature: _____          Date: _____

Name and Matric No.: <u>Umar Musa, GS39873</u>

**Declaration by Members of Supervisory Committee**

This is to confirm that:
- the research conducted and the writing of this thesis was under our supervision;
- supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) were adhered to.

| | |
|---|---|
| Signature: | |
| Name of Chairman of Supervisory Committee: | Associate Professor Dr. Habibah Ab. Jalil |

| | |
|---|---|
| Signature: | |
| Name of Member of Supervisory Committee: | Associate Professor Dr. Aminuddin bn Hassan |

| | |
|---|---|
| Signature: | |
| Name of Member of Supervisory Committee: | Associate Professor Dr. Abdullah Mat Rashid |

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| | |
|---|---|
| A | Attitude |
| AKCILS | Aminu Kano College of Legal Studies |
| BI | Behavioural Intention |
| C-TAM-TPB | Technology Acceptance Model and Theory of Planned Behaviour |
| COE | College of Education |
| DV | Dependent Variable |
| EDA | Exploratory Data Analysis |
| EE | Effort Expectancy |
| EGS | Educational Computer Games |
| ETF | Education Trust Fund |
| FC | Facilitating Condition |
| FC | Facilitating Condition |
| FCE | Federal College of Education (Technical) Bichi |
| FCEKN | Federal College of Education, Kano |
| FRN | Federal Republic of Nigeria |
| FRN | Federal Republic of Nigeria |
| ICT | Information and Communications Technology |
| IDT | Innovation Diffusion Theory |
| IT | Information Technology |
| IV | Independent Variables |
| MM | Motivational Model |
| NCE | Nigerian Certificate of Education |

| | |
|---|---|
| NCE | Nigerian Certificate of Education |
| NICTP | National Information and Communication and Technology |
| NITDA | National Information Technology Development Agency |
| NPC | National Population Commission |
| NRI | Networked Readiness Index |
| NUMIS | Nigerian University Management Information System |
| PE | Performance Expectancy |
| SAS | School for Arabic Studies |
| SCT | Social Cognitive Theory |
| SI | Social Influence |
| SPSS | Statistical Package for the Social Sciences |
| TAM | Technology Acceptance Model |
| TETFUND | Tertiary Education TRUST FUND |
| TPACK | Technological Pedagogical Content Knowledge |
| TPB | Theory of Planned Behaviour |
| TRA | Theory of Reasoned Action |
| UNESCO | United Nations Educational, Scientific, and Cultural Organisation |
| USAID | United States Agency for International Development |
| UTAUT | Unified Theory of Acceptance and Use of Technology |
| WWW | World Wide Web |

# CHAPTER 1

# INTRODUCTION

## 1.1        Background of Study

In these modern times, the fast development of Information and Communications Technology (ICT) has affected various aspects of human life. Furthermore, education is now inclusive. ICT offers a diverse chance for institutions to develop existing instructional systems and set new and old agendas to meet the needs of learners in the future (Mahmood & Bokhari, 2012). The term 'ICT' relates to any process that can store, collect, receive, manipulate, and transmit information or data (Onwuagboke, Singh, & Fook, 2015). Teachers are the key players in the effective integration of technology into teaching and learning (Ismail, Norbaya Azizan, & Azman, 2011).

Similarly, lecturer competence and having the right attitude regarding the role of modern technologies also determine the successful integration of ICT resources in school (Bamigboye, Bankole, Ajiboye, & George, 2013).

ICT continues to transform the world, vastly improving, facilitating, and effectively helping persons to perform certain tasks much faster than before (ITU, 2014). This transformation saves time and ensures efficiency and cost-effectiveness in most areas ICT is applied whilst also bringing long distances closer. With the world now connected by ICT, people are linked together as if all are in one universal village (Saeed & Zyngier, 2012). According to Valtonen, Kukkonen, Kontkanen, Sormunen, Dillon, and Sointu (2015), the advent of ICT has allowed people to make better decisions in every aspect of life, besides enabling information to circulate around the world at the speed of light, with global news and happenings becoming easily accessible and more transparent.

The impact of ICT on life in general and more specifically on education has become fundamentally revolutionary such that ICT has improved teachers' teaching and learning performance. Now, the skills of educators are linked to how they can integrate ICT into their teaching activities (Fullan & Langworthy, 2013). Similar to other developing nations in the world, the Nigerian educational system has also started incorporating ICT. The advent of ICT in the country's educational system has enhanced and revolutionised teaching concepts and the learning process as a whole (Mellul, 2018). ICT now influences the structure of the academic courses, the administration, and the management of institutions, as well as entire academic settings, together with the participant roles in the instructive process (Okwor, Mole, & Ihekwoaba, 2015).

From a Nigerian perspective, as a technology, computers are crucial. Per Nigeria's IT strategy, ICT is related to computer hardware, software, and affiliate facilities with

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comparable processes, utilities, and associated assets (FRN, 2001). The declaration issued by the National Policy for Nigeria Information Technology states the need for an IT commission based on credible and significant human assets in terms of equipment and systems, accounts for the vital apparatus, skills and capabilities, and a means for policy and liberal change and the management of steps to promote justifiable growth (Uyouko & Wong, 2013).

Before the year 2012, the Nigerian National ICT Policy, the 1988 and 2001 National Policies, had introduced software education into the local secondary education scheme. As a result, ICT literacy and ICT skills were made mandatory after the educational meeting of the 2004/2005 Academic Session for all lecturers in Nigerian Colleges of Education. Lecturers in these Colleges are required to incorporate ICT into their school operations. ICT skills refer to the capacity of lecturers to properly use ICT to incorporate, assess, handle, and access data, communicate with others, and create new knowledge, so that they can efficiently engage with the community (Hogarth, 2017).

Innovations in the ICT provision of the Nigerian education sector yield evident system changes that have allowed administrators, students, and academics to increasingly acquire ICT awareness. In this case, many capacity building programs have been established to enhance the ICT user understanding of on-going developments in various institutions. Some institutions have even inaugurated separate units to handle staff training in ICT (Mahmud, Ndomi, & Omodara, 2017).

Consequently, the development of ICT globally to meet the needs of the 21st century, through the easily accessible Internet, has caused great changes to human endeavours as a whole, followed by the trend of obtaining ICT knowledge that would enable a person to become a lifelong learner within a setting of collaborative learning with experts whilst progressing with peers, social communities, and the world at large (Mahmud et al., 2017). Additionally, Olayiwola and Alimi (2015a) stressed that the introduction of online technology in the teaching and learning process in higher education institutions has significantly improved the dissemination of knowledge. According to Harerimana, Mtshali, Hewing, Maniriho, Kyamusoke, Mukankaka, and Mugarura (2016), globally, the introduction of online methods of teaching in tertiary institutions and the use of blended learning—a combination of electronic media and conventional methods—are changing old methods of teaching and learning.

Moreover, previous research involving lecturers from various Colleges of Education in Kano State showed that ICT facilities are gaining more attention because of its relevance and facilitative functions. Studies have also shown that teaching using ICT facilities reduced labour-intensive work and increased student understanding of the learning content within the shortest possible time (Efuwape & Aremu, 2013). According to Goktas, Yildirim, and Yildirim (2009b), lecturers could benefit from ICT, as it helps them create an exciting and stimulating atmosphere inside and outside the classroom.

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### 1.1.1    Background of ICT in Nigeria's Tertiary Institutions

In February 2007, Nigeria's Ministry of Education launched the ICT Department. The officials, organisers, and the Private Sector have adopted a number of distinct measures since the Department's founding to introduce and promote ICT into the national education system. Nigeria has acknowledged the ICT ability of the College Scheme, which was established as part of the educational reform policies for the Nigerian university system aimed at integrating the use of ICT, particularly laptops. The first domestic program was posited in a strategy paper from the Federal Government in 1988 called the National Computer Education Policy (FME, 1988).

The tertiary schools in the above paper were authorised to teach Computer Science as a topic or discipline and to incorporate it into the administration and training of the College. In the document, the tertiary institutions were also mandated to teach Computer Science as a subject discipline and to integrate it into the administration and instruction of the school. Following amendments in 1998 and 2004, the National Education Policy (FRN) further reemphasised the need to integrate ICT into the Nigerian Education Scheme. For instance, the fourth edition of the FRN in 2004 stressed once again the need for ICT to be introduced into the classroom. This action indicates an understanding of the need to reach an ICT usage stage beyond just the laptop, as well as the need for more ICT infrastructure.

### 1.1.2    Colleges of Education in Nigeria

As identified in Nigeria's National Education Policy, a College of Education is a post-secondary teacher education institution (Olusola, Olayiwola & Alimi, 2015a). According to Garba (2014), this higher education scheme includes all forms of education acquired in universities, Colleges of Education, and polytechnics following secondary education and involves organisations that provide correspondence courses. The College of Education is Nigeria's academic education department is charged with the obligation of training teachers, not to acquire non-degrees but rather qualitative certifications in education. The purpose of Colleges of Education in Nigeria is to provide three years of training to the candidates after senior secondary school education for the award of the Nigeria Certificate in Education (NCE). Graduates of Colleges of Education can teach at all levels of the Nigerian educational system, i.e., pre-primary school, primary school, and junior secondary schools.

In the 2004/2005 academic meeting of the Nigerian Colleges of Education, ICT literacy and skills were made mandatory for all lecturers and were underlined for incorporation into school operations. In October 2010, the learners' curriculum for pre-service programs in all Colleges of Education in Nigeria set minimum technology requirements as a compulsory element.

### 1.1.3    Nigeria's Policy on Information and Communications Technology

As a nation, Nigeria has acknowledged the opportunity that ICT could provide to its instructional structure. Additionally, the domestic software education policy has also highlighted the need to incorporate ICT into the Nigerian education system. The National Computer Education Policy (FME, 1988) highlighted the need for tertiary schools to include Computer Science as a discipline and to incorporate it into classroom administration, although its application up till now is still inefficient (Aworanti, 2016). The Federal Republic of Nigeria, FRN (2004), established the integration of ICT into the teaching/learning scheme as a key tool for enhancing national instructional goals and development.

In the year 2007, the Government of Nigeria supported numerous measures and legislation related to ICT with the primary objective of establishing the ICT sector and assisting its capacity to drive national development (Yusuf & Yusuf, 2009). To accomplish this goal, nine policies NICTP (2012) were established, namely, using ICT in long-distance teaching, providing research prizes and ICT teaching scholarships, making ICT mandatory at all stages of education, organising training workshops for ICT employees of the Nigerian Youth Corps, developing ICT modules for all the distinct stages of the education scheme, establish Private and Public ICT coaching Colleges in cooperation with global and local ICT knowledge transfer schemes, create centres for ICT skills, arrange training workshops for ICT employees of the Youth Corps, and encourage ICT firms to invest in education.

The 1988 and 2004 amendments to the Nigerian National Education Policy (FRN) stressed the need to incorporate ICT into the Nigerian education scheme. The Nigerian National Information Technology Policy (FRN, 2001) highlighted three significant goals, among others, including: to empower young people with ICT abilities to prepare them for worldwide competitiveness; to incorporate ICT into standard education; and to train multifaceted ICT organisations as centres of ICT competence. ICT has helped improve access to and educate people on the importance of education performance in the Nigerian education system. It has accelerated information gain and concentration prominently, providing developing countries with outstanding opportunities to enhance existing instructional systems, besides helping to develop and execute strategies, as well as extending more opportunities for both businesses and the needy. This creative communication tends to decrease the feeling of segregation and exposure to excess information. Besides, ICT has also improved access to funds for distant learning such that teachers and learners no longer have to depend solely on concrete media stored in libraries that often exist in limited quantities for instructional purposes.

### 1.1.4    Factors Influencing ICT usage

Past studies have categorised factors influencing the acceptability and use of ICT into performance expectancy, effort expectancy, social influence, and facilitating conditions based on the Unified Technology Theory of Acceptance and Use (UTAUT) (Venkatesh

et al. 2003). Other factors that have been proposed include technological pedagogical content knowledge (TPACK) based on the TPACK theory (Mishra & Koehler, 2006) and attitude towards ICT from the Technology Acceptance Model (TAM) (Davis et al., 1989).

Scholars such as Cohen, Bancilhon, and Sergay (2013) are convinced that a specific technology would be advantageous to a person. As part of this research, Colleges of Education lecturers must have a certain performance expectancy to embrace and use ICT devices for teaching in e-learning, mobile learning, and distance learning technologies, in comparison to the use of ICT as teaching instruments in conventional classrooms, to upgrade teaching performance and improve learner efficiency. However, many lecturers are fond of adopting the chalk-and-talk method to teach instead of using ICT. The increasing numbers of lecturers who do not accept or use ICT for teaching could deny their students (teacher trainees) the vast opportunities that ICT offers (Agbetuyi & Oluwatayo, 2012). Based on the above factors, this research is motivated to measure the performance expectancy of lecturers of Colleges of Education in Kano State, Nigeria, i.e., their belief in accepting and using technology for teaching and learning.

Effort expectancy is another variable in the UTAUT model that measures the user-friendliness associated with IT use, per Venkatesh et al. (2003). The expectation of effort required to use technology is based on the concept that the attempts made at the job, the results obtained, and the benefits earned are inter-connected (Ghalandari, 2012).

Social influence refers to a social status in which the interaction and expectation of family and friends institute social factors that can impact one's awareness of a specific behaviour. Social influence affects employee behaviour, as supported by many studies such as RejónGuardia, Sánchez-Fernández, and Muñoz-Leiva (2013). In addition, Jones and Wang's (2010) research, which involved 268 lecturers from three universities in Taiwan, examined the impact of social influence on behavioural intention to use ICT; the research found that social influence had a powerful impact on the use of ICT.

It is important to emphasise that facilitating conditions relate to the degree to which a lecturer thinks that there is an organisational and technical framework to promote system usage (Venkatesh, Morris, Davis, & Davis, 2003). Pieces of evidence have shown that when users feel that they are supported in a variety of ways, they will be more motivated to use the system (Al-Dalou & Abu-Shanab, 2013; San Martín & Herrero, 2012; Williams, Dwivedi, Lal, & Schwarz, 2009). The availability of ICT laboratories and well-equipped facilities in Colleges of Education will enable the lecturers to appropriately make use of ICT facilities.

Meanwhile, TPACK was formulated to describe the understanding of technology, pedagogy, and content as all-inclusive components necessary for effective instructional operation (Garrett, 2014). Moreover, TPACK combines technological information, content information, and pedagogical expertise into one structure. In sum, TPACK

interlinks technology, pedagogy, and content as an inclusive unit that could improve the teaching/learning process (Harris & Hofer, 2011).

Attitude is a tendency to respond to individuals, thoughts, items, and organisations negatively or positively (Preston, Cox, & Cox, 2000). The teacher's attitude towards ICT is one of the biggest problems hindering the use of ICT facilities for successful teaching and learning (Bauer, 2013). According to Kpolovie and Awusaku (2016), if a person's approach to a specified item is recognised, it may be used in combination with other situational factors to forecast and clarify the person's responses to that item.

Based on the above discussion, this research has identified the need to determine the impact of performance expectancy, effort expectancy, social influence, facilitating conditions, technological pedagogical content knowledge (TPACK), and attitude towards ICT on the ICT usage of lecturers in Colleges of Education in Kano State, Nigeria.

## 1.2 Problem Statement

Globally, the progress in technology, including ICT, is a considerable force driving the economic growth and development of a country, Nigeria notwithstanding (Oghogho, 2013). Orús, Barlés, Belanche, Casaló, Fraj, and Gurrea (2016) have shown that the application of ICT in education can significantly improve teaching and learning. To date, teachers at all levels understand the value of ICT and have the foresight to use them, even proposing ICT usage for academic improvement (Shinn, 2015). Now, ICT has become the centre of global efforts for education reform. However, developing countries, more specifically Nigeria and Northern Nigeria, are not yet able to benefit from the developments and advances of technology in education and research (Obayelu & Ogunlade, 2006).

The failure among academicians to use ICT has become an issue of great concern in Nigeria (Okebukola, 2013). The Federal and State Governments, through the Ministry of Education, have invested huge sums to increase lecturers' pay and fringe benefits, renovate colleges, and provide ICT-related training and courses for the lecturers to acquire fundamental computing knowledge and skills. According to Mando (2016), the education policy has resulted in no measurable return from the enormous annual budget allocations spent on new facilities and systems dedicated to lecturers' ICT use for teaching and learning.

Hamza and Mabawonku (2018) investigated the effects of performance expectancy and facilitating conditions on digital library use among engineering lecturers in universities in Southwest Nigeria. The study highlighted only two predictors of ICT usage, namely performance expectancy and facilitating conditions. However, the literature related to this area of investigation reveals many other factors related to ICT usage. Therefore,

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there is a need to conduct an additional study to explore the other substantial variables that predict ICT usage in the country.

Nevertheless, not many studies have focused on the impact of performance expectancy, effort expectancy, social influence, facilitation conditions, TPACK, and attitude towards ICT, on the ICT usage of tertiary institution lecturers in Nigeria. Therefore, this study aims to examine the effect of these variables on the use of ICT in Nigeria's Colleges of Education.

The current study provides empirical evidence on the relationship between performance expectancy, effort expectancy, social influence, facilitating conditions, technological pedagogical content (TPACK) and attitude towards ICT, and the ICT usage among the lecturers in Saadatu Rimi College of Education, the Federal College of Education Technical Bichi, the Federal College of Education Kano, and the Aminu Kano College of Islamic Legal Studies, Nigeria.

## 1.3          Objectives of Study

The following objectives were formulated to guide the study:

1. To determine the impact of performance expectancy, effort expectancy, facilitating conditions, social influence, TPACK, and attitude towards ICT on the level of ICT usage among lecturers in Kano State Colleges of Education.
2. To compare the differences in ICT usage among the lecturers of Colleges of Education based on education level and specialisation.
3. To determine the relationship between performance expectancy, effort expectancy, facilitating conditions, social influence, TPACK, and attitude towards ICT, and the ICT usage among the lecturers of Colleges of Education.
4. To examine the top predictors of ICT usage among lecturers from Colleges of Education in Kano State, Nigeria.

## 1.4          Research Questions

Nine research questions were formulated based on the research objectives:

1. Does performance expectancy affect the level of ICT usage among the lecturers of Colleges of Education?
2. What is the perceived effort expectancy regarding ICT usage among the lecturers of Colleges of Education?
3. What is the perceived social influence regarding ICT usage among the lecturers of Colleges of Education?

4. What is the perceived facilitating conditions regarding ICT usage among the lecturers of Colleges of Education?
5. What is the perceived level of technological pedagogical content knowledge (TPACK) regarding ICT usage among the lecturers of Colleges of Education?
6. What is the effect of attitude toward ICTs on the ICT usage of lecturers of Colleges of Education?
7. Is there a significant difference in ICT usage among the lecturers of Colleges of Education based on education level and specialisation?
8. Is there a significant relationship between performance expectancy, effort expectancy, facilitating condition, social influence, TPACK, and attitude towards ICT usage, and ICT usage level among the lecturers of Colleges of Education?
9. What are the best predictors that influence the ICT usage among lecturers of Colleges of Education in Kano State?

## 1.5     Significance of the study

This study investigated the effect of selected respondent demographic factors (education level, specialisation, age, and ICT training) on ICT usage, as well as the effect of performance expectancy, effort expectancy, facilitating condition, social influence, Technological Pedagogical Content Knowledge (TPACK), and attitude towards ICT, on the level of ICT usage among lecturers in four Colleges of Education in Kano State, Nigeria. The findings of this study will help strengthen and improve the ICT usage quality among lecturers of Colleges of Education by making them realise the importance of ICT in teaching and learning. The findings of this study gained and provided beneficial information for the administrators of Colleges of Education in Kano State. Also, the findings encourage the lecturers in these Colleges to use ICT continuously to prepare for a successful career path and working environment. These aims could be achieved by encouraging the lecturers to fully use ICT for various purposes.

The findings of this study could help the lecturers in Kano State, and, by extension Nigeria, develop a positive attitude towards ICT use. The lecturers' answers to the questions will help other lecturers in the field obtain more knowledge of ICT usage. The research also serves as a guide and a source of new literature for potential scientists in the field to refer to. Lecturers across comparable contexts could also benefit from this study.

The findings of this study also contribute significant new knowledge to the existing body of work on ICT usage among lecturers in Colleges of Education in Kano State and Nigeria as a whole. It also serves as a guide or blueprint for strategies meant to increase ICT usage among lecturers in Colleges of Education in Kano State and Nigeria.

It is hoped that the findings benefit the Nigerian education system, and subsequently lead to a more practical technological implementation, not only among lecturers of Colleges

of Education but also all lecturers from all disciplines. Finally, this study also opens new doors for future research related to this field.

## 1.6     Scope of study

This study aimed to determine the level of performance expectancy, effort expectancy, social influence, facilitating conditions, technological pedagogical content knowledge, and attitudes towards ICT usage among the sample population, which was restricted to 307 lecturers from four Colleges of Education in Kano State, Nigeria. In this study, the data was gathered using a questionnaire, which was designed to elicit the perception of lecturers of Colleges of Education in Kano State regarding the factors listed above. The population only consisted of lecturers from Colleges of Education in Kano State. It is assumed that these lecturers had enough experience in using ICT and had sufficient exposure in handling and working with a wide array of technologies, including computers, the Internet, and smartphones when imparting knowledge to students. The lecturers were also assured that their responses would remain confidential and that they would remain unidentified, with the hope that the lecturers would provide honest responses.

The results may not be generalisable to lecturers of other higher institutions because the sample population was limited due to time and financial constraints. This study is only limited to lecturers from Colleges of Education in Kano State, Nigeria. The researcher adopted the instrument from the Calouste Gulbenkian Foundation (CGF, 2016) to analyse ICT usage among the sample population. Meanwhile, performance expectancy, effort expectancy, facilitating conditions, and social influence were adopted from Venkatesh (2003). The data obtained from the questionnaire were analysed using both descriptive and inferential analyses. The results of this study could be extended to future research.

## 1.7     Delimitation

The study limited the sample to lecturers from four Colleges of Education in Kano State, Nigeria. A questionnaire was used as the instrument for data collection, so the researcher had to rely on the opinions of the respondents to assess their intentions, attitudes, and perceptions concerning ICT usage. Hence, the findings are based on the respondents' self-reports, which is an obvious limitation to this research. Hence, great caution must be taken when interpreting the results of this study. Another limitation to this research was that the sample was limited to only lecturers from Colleges of Education in Kano State, Nigeria; hence generalisation of the findings may only be limited to this scope. Similarly, this study was limited by time. Hence, some vital ICT indices that would have been very helpful for interpreting the results might have not been included because of the limited time frame assigned to the researcher to conduct the research.

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## 1.8 Definition of Terms

The key terms of the study were defined conceptually and operationalised according to the research scope. These key terms are defined in the following sections:

### 1.8.1 Information and Communications Technology (ICT)

According to Ubulom, Kayii, and Dambo (2016), ICT can be defined as the technologies that help people process, retrieve, record, transfer, receive, and store information.

In the context of this study, ICT is defined as all the techniques that enable the lecturers in Colleges of Education, Kano State, Nigeria, to retain, store, and handle computers and Web apps, electronic mail, and the World Wide Web for teaching and learning.

### 1.8.2 ICT Usage

The Calouste Gulbenkian Foundation (CGF, 2016) defined ICT as a mixture of IT and other associated techniques, namely communications technology. The use of ICT implies using the Internet together with computer networks, the World Wide Web, email, and search engines for information production and storage (Hair, Anderson, Babin, & Black, 2010). Accordingly, Saraf, Choudhury, Das, Singh, Borgohain, Baral, and Sharma (2016) defined the use of ICT as the use of a variety of technological instruments and assets to interact, disseminate, store, and handle data.

In the context of this study, ICT usage refers to the extent of the lecturers' perception of ICT facilities available for teaching and learning, which also facilitates the lecturers' electronic retrieval of teaching materials for imparting knowledge to learners.

This study used the Calouste Gulbenkian Foundation (CGF 2016) instrument on teachers' Digital Literacy and use of ICT. This instrument originally focused on the frequency, quality, and diversity of ICT use in teaching and learning (CGF 2016). It has now been used in almost five countries with high reliability and validity. This instrument measures 37 items that describe how often the respondent uses ICT. Therefore, the current research instrument has 37 items.

### 1.8.3 Performance Expectancy

Performance Expectancy is defined as the extent to which customers profit from the use of technology during their operations (Venkatesh, Thong, & Xu, 2012).

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In the context of this study, performance expectancy refers to the extent to which academic lecturers believe that using ICT will assist them to accomplish their academic tasks for teaching and learning. This variable was measured using a questionnaire developed by Venkatesh et al. (2003) with slight modifications. The questionnaire has been used in past studies, yielding high reliability and validity. The instrument measures nine items.

### 1.8.4 Effort expectancy

Effort expectancy according to Davis (1989), is the degree to which an individual thinks that it will be effortless to use a specific technology. In other words, effort expectancy is the degree to which a technology is easy to use (Jambulingam, 2013). In the context of this study, effort expectancy refers to the extent to which lecturers believe that using ICT is easy and effortless. This variable was measured using a questionnaire developed by Venkatesh et al. (2003) with slight modifications to suit this study. The instrument has been used in past studies, yielding high reliability and validity, and it measures 11 items.

### 1.8.5 Social Influence

Social Influence is the extent to which an individual recognises that other people accept that he should use a certain innovation (Venkatesh et al., 2003). It also explains the perception of the user regarding the amount of effort needed to use a system (Treem & Leonardi, 2013).

In the context of this study, Social Influence refers to the extent to which the lecturers believe that other people's views will influence them to use ICT. This variable was measured using a questionnaire developed by Venkatesh et al. (2003) with modifications to suit this study. It has also been proven to yield high reliability and validity. This instrument measures six items.

### 1.8.6 Facilitating Conditions

Facilitating conditions relate to the level to which a person thinks an organisational and technical framework is available to promote the use of a scheme (Venkatesh et al., 2003). In the context of this study, facilitating conditions are the extent to which the lecturers believe that technology (such as computers and networks) and other infrastructure such as ICT laboratories are available to maintain the use of ICT. This variable was measured and adapted for this study using a questionnaire developed by Venkatesh et al. (2003). The questionnaire has been proven to have high reliability and validity. This instrument measures five items.

Four variables were measured using the questionnaire developed by Venkatesh et al. (2003) with modifications to suit this study. The first is Performance Expectancy (9 items). The nine items were designed to examine the lecturers' perceptions of the benefits and usefulness of ICT usage. These items were adapted from Venkatesh et al. (2003), with permission. Next is Effort Expectancy (11 items). The eleven items were designed to examine the lecturers' perceptions of the ease and accessibility in using ICT facilities. The items were adapted from Venkatesh et al. (2003), from whom the permission to use the instrument was obtained prior to the actual study. The third variable is Social Influence (6 items). The six items were designed to investigate the lecturers' perceptions of the image and the influence of others in effecting their use of ICT facilities. The items were adapted from Venkatesh et al. (2003). The fourth variable is Facilitating Conditions (5 items). The five items were designed to identify the lecturers' perceptions of facilitating conditions in the form of technical and administrative support provided by the colleges for ICT usage. All items were adapted from Venkatesh et al. (2003).

### 1.8.7 Technological Pedagogical Content Knowledge (TPACK)

Technological pedagogical content knowledge (TPACK) refers to the compound interrelationship between understanding of the subject matter, instructional methods, and teachers' technology use (Mishra & Koehler, (2006). TPACK refers to the teacher's understanding of how to coordinate subject-specific operations or topic-specific operations with topic-specific depictions using modern techniques to better teach students (Cox & Graham, 2009).

In this study, a TPACK questionnaire was developed based on the instrument developed by Mishra and Koehler (2006). The questionnaire was used in the past and has proven to have high reliability and validity. This instrument measures nine items.

### 1.8.8 Attitude towards ICT

Attitude refers to a person's thoughts or feelings about a subject matter—whether favourable or unfavourable (Price, Ratke, & Moen, 1980). In short, it is an evaluation of a person's positive and negative predispositions towards an object, being or a thing, ranging from extremely negative to extremely positive (James & Christian, 2016).

In the context of this study, attitude towards ICT was measured using a questionnaire developed by Albirini (2006), modified to suit this study. The scale consisted of 17 items divided into three components: affective, cognitive, and behavioural (Albirini, 2006). This questionnaire has been used in the past and has proven to have high reliability and validity. This instrument measures 17 items.

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## 1.9        Chapter Summary

This chapter introduced the issue associated with the topic under study. It also briefly explained the current issue surrounding ICT usage among lecturers of Colleges of Education in Kano State, Nigeria. Henceforth, it highlighted the need to address issues relating to the factors affecting ICT usage in higher education. The significance of the study, the scope of the study, the operational definition, and the overall structure of this research were then outlined based on the discussion presented and the research objectives, as well as Nigeria's policy on ICT. Next, Chapter 2 presents a review of the existing literature and a more detailed explanation of the underpinning theories and issues surrounding the use of ICT, as well as the factors affecting ICT usage among the lecturers in Colleges of Education in Kano State, Nigeria.

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