

Impact of Information and Communication Technology (ICT) Adoption on Staff Productivity in Federal University of Kashere, Gombe State, Nigeria (2012 – 2022)

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Abstract:- The study examines the impact of Information and Communication Technology (ICT) adoption on Staff Productivity in Federal University of Kashere, from 2012 to 2022. Whereas some studies have examined the impact of ICT across various sectors of human endeavors including the academia, the case of Federal University of Kashere has not been examined. This leaves a gap in the available knowledge which should guide the modalities of ICT adoption for improved staff productivity in Federal University of Kashere and other higher institutions of learning in Nigeria as a whole. To examine the case of Federal University of Kashere, a quantitative method of research was utilized, with the use of a Chi Square to ascertain the significance of ICT adoption on staff productivity in the study area, which proved positive. However, some recommendations are made for the university and other institutions of higher learning to take into consideration in the adoption of ICT to enhance staff productivity across job roles found in academic institutions.

Keywords:- ICT Adoption, Staff Productivity, Job Roles, Research and Learning, Administration, Support Services, Federal University of Kashere.

I. INTRODUCTION

In the world of the twenty-first century, technological advancements have had a profound impact on all human endeavours (Bueechl, Harting, and Schroder, 2021). The technological innovations and transformations that define the information and communication technology era have established a digital technology with commendable effects on business, corporations, industries, and organisations (Oni and Koko, 2020). The importance of digital technology in educational institutions cannot be overstated. In the pursuit of efficient service delivery, the adoption of information technology has become crucial for all businesses and organisations (Okey-Colbert and Ukandu, 2019). This holds true for all institutions of higher education, including colleges, polytechnics, and universities.

It has been determined that the Nigerian education system requires more effective and efficient methods of employee performance and service delivery. While many educational institutions in Nigeria have adopted digital technology, the Corona Virus Disease of 2019 (COVID-19), which became a global pandemic in 2020 has necessitated additional digitization efforts in the country's education

sector. The events that characterised the COVID-19 lockdown as a containment measure for the pandemic and the events that occurred after the lockdown, such as the End-SARS nationwide protest highlights the need for Nigerian tertiary institutions, particularly universities to adopt digital technologies.

Although Nigerian universities have begun adopting digital technology to meet their needs and provide the expected services, the impact of the adoption of digital technology in Nigerian universities must be determined prior to the twenty-first century. While a number of studies, including Nwankwo (2022), Work Foundation (2022), Bueechl, Harter, and Schroder (2021), Wilburn and Wilburn (2018), and Rezaei, et al (2014), have attempted to examine the role of digital technology in business, work, work space, and performance, little is known about its role in Nigerian universities. Therefore, this study will investigate the adoption of digital technology at Federal University, Kashere, as well as the relationship between digital technology adoption and University staff productivity.

II. STATEMENT OF RESEARCH PROBLEM

The implementation of digital technology has been met with considerable scepticism. This is a result of the Marxian argument regarding capital's adoption of technology, in which it is argued that capital's adoption of technology "is not for the benefit of the proletariat working class, but rather for the profit value the technology adds to the capitalist" (Marx, Zodiac and Baggins, and Blain, 2010). Furthermore, it is argued that the introduction of new technology replaces workers in the industry because the machine that represents the technology performs more tasks at a lower cost than a human worker. This argument stems from the belief that the adoption of digital technology will result in the loss of many jobs (Larson and Teigland, 2020). In order to determine whether or not the Marxist theory's arguments are valid, Nigerian Universities must examine their Marxist arguments regarding the adoption of technology within an organisation.

Nevertheless, the benefits of adopting digital technology for a University system cannot be overstated. While some studies have examined the impact of digital technology adoption on Universities in North America, Asia, and Europe, others have investigated the relationship between digital technology adoption and University Staff Productivity. However, there is a dearth of information regarding the impact of Universities' adoption of information

technology in Nigeria. Therefore, it is necessary to collect data and empirically examine the impact of the adoption of digital technology on the productivity of University staff in Nigeria. Therefore, Federal University, Kashere will be used as a case-study.

To this end, the objectives of the study include assessing the level of digital technology adoption in Federal University, Kashere; examining the relationship between digital technology adoption and Staff productivity in Federal University, Kashere; ascertaining the impact of digital technology adoption on Staff productivity in the selected University; and suggesting ways through which digital technology adoption in the University can be utilized for effective and efficient staff productivity in a sustainable manner.

III. RESEARCH HYPOTHESES

The study has the following hypotheses to be tested:

- H_0 : There is significant relationship between digital technology adoption and Staff productivity in Federal University, Kashere.
- H_1 : There is no significant relationship between digital technology adoption and staff productivity in Federal University, Kashere.

IV. CONCEPTUAL/THEORETICAL FRAMEWORK AND EMPIRICAL REVIEW

A. Conceptual Framework

- **Digital Technology:** The study contextualises collaborative online learning tools, information and communication technology (ICT) systems, and general computer devices as digital technology. Online collaborative learning in the context of online constructivism encourages users to share, participate, contribute, and interact synchronously with colleagues and peers (Kumi-Yeboah, Kim, Sallar and Kiramba, 2020). Numerous digital technologies support the pedagogical, research, administrative, and financial aspects of the University work environment, taking into account the academic and non-academic roles of University Staff. These technologies include, among others, computers, iPads, and smart phones. According to Chao, Roblyer & Doering (2010) in (Kumi-Yeboah et al 2020) these tools are effective in learning environments because they serve a variety of functions for students, instructors, and support staff in academic institutions.
- **Staff Productivity:** The concept of staff performance has been elaborated upon by numerous academics in a variety of disciplines. Boyne, Farrell, Law, Powell & Walker (2003:32) equate staff productivity and performance, implying that performance is essential in the administration and management of any organisation, regardless of its sector. This is due to the fact that it helps management determine whether their organisations are improving, declining, or remaining stagnant. Therefore, organisational performance is determined by efficiency. While staff productivity is sometimes interpreted as efficiency, Dalap (2020: 11-12) defines it as an input-output relationship in which the most work is

accomplished with the least amount of energy or resources. This concept emphasises getting the most out of employees, even if it means requiring them to put the organization's interests and needs ahead of their own. Therefore, it is task-oriented and, as such, requires that the worker be well-trained and qualified in the field and the necessary equipment.

B. Empirical Review

In their article, "Influence of Digitization on Employee Satisfaction in Small and Medium-Sized Enterprises," Bueechl, Harting, and Schroder (2021) examine the relationship between digital technology and employee satisfaction in companies. The work utilised a qualitative empirical methodology, with data gathered from expert focus group interviews and analysed using the Grounded Theory method. The work argues that the acceptance and changes of digital technology, the risk of digital technologies, the core drivers of digitization, the improved work-life balance of digital technologies, and their impact on employee satisfaction are influential determinants of digital technology adoption and employee performance. In addition, it hypothesises that there is a multidimensional correlation between the degree of digitization and employee satisfaction (Bueechl, Hartl, and Schroder, 2021: 2759). Nonetheless, other factors and causes are decisive for employee satisfaction in organisations, as the adoption of digital technology cannot explain it alone.

Akwu, Duke, and Victoria (2021) examined the impact of ICT on Nigerian politics, administration, education, security, and business. Using the theory of social change, it is argued for progress and change because no society is static. Thus, national development is enhanced through ICT, and recommendations are made to address visible challenges. It is believed that technology is one of the prerequisites for social change as a means to an end. Therefore, ICT is a means of transforming Nigeria's politics, administration, security, businesses, education, and employment from their current inactive state to a stage of effective activity for the nation's overall development.

In Productivity, Technology, and Working Anywhere, Work Foundation (2022) examined the relationship between productivity, technology, and the work environment. The treatise asserts that the adoption of new technologies increases employee productivity and the employee's capacity to acquire new technology-related skills. The treatise argues, however, that the adoption of new technologies and the skills to utilise them require appropriate organisational practise, flexibility, identification of enablers and barriers, organisational leadership, and creativity. In addition, adequate policies, procedures, evaluation, and planning are required for the achievement of the desired objective. At the centre of this are effective management and employee engagement, as everyone would be able to take advantage of technological advancements to perform at their peak (Working Foundation, 2022).

Rezaei et al. (2014) observe in "The Effects of Information Technology (IT) on Employee Productivity in Shahr Bank (Case Study of Shiraz, Iran)" that studies conducted on the adoption of information technology's effect on organisational productivity indicate that some have improved over time. Several studies evaluated the impact of information technology on productivity using conventional methods. This indicates that information technology and productivity are positively related. Diversity, quality, time, and timely delivery are among the potential causes of the productivity paradox in the relationship between information technology and productivity, along with intermediate measures.

Similarly, there are studies devoted to identifying the additional investments necessary for organisations to adopt information technology in order to achieve higher levels of productivity. This is comparable to the impact of information technology on labour productivity and efficiency. Alipour (2009) concluded in "The effects of using automation systems on human resource productivity (Case study of Mazda Yadak Comapay)" that there is a logical connection between effectiveness and efficiency. T. Zadeh (2006) examined the impact of information technology on the organisational effectiveness of *The Organization of Libraries, Museums, and Documents Center of Astan Quds Razavi*, in accordance with Alipour (2009). The treaties contend that the adoption of information technology systems increases an organization's efficiency. In addition, the application of information technology tools expedites data recovery and facilitates rapid information accessibility. This is in stark contrast to the situation before the introduction of information technology tools.

Studies have shown that human capital and investment in information and communication technology have a significant effect on labour productivity. According to Jahromi (2005) in Rezaei .M. et al (2014) investigated the impact of information technology on organisational productivity from the perspective of Kosar Financial Corporation managers. The impact of information technology on the components of productivity that studies indicate are work rate, work procedures, and organisation costs was examined. The findings of the studies indicate that the adoption of information technology tools increases the rate of work, improves work practises, reduces organisational costs, and boosts the staff's overall productivity. Aghaei (2005) in Razeai.M et al (2014) examined the relationship between information technology and productivity at the South Pars Gas Complex Company, confirming Farahani (2004)'s assertion that the application of information technology empowers employees at the Qom Social Security Department.

C. Theoretical Framework

In the analysis of technological adoption and productivity, various theories have been utilised. (Onabanjo, 2007) and Technology Acceptance Model (Nwankwo, 2022: 158). The Technology Acceptance Model proposed by Fred Davis (Davis, 1989) was adopted for the purposes of this study. The Technology Acceptance model is comprised of two constructs that explain how users accept and employ new

technological systems and tools. The two constructs are perceived usefulness and perceived ease-of-use, respectively. Perceived usefulness is essentially an employee's belief that the adoption of a specific machine or technology would improve their performance. Perceived ease-of-use is the degree to which employees believe they could use a new machine or technology with little or no effort, and that the use of these new machines or technologies would necessitate fewer efforts to complete a task than was previously required. The significance of perceived ease of use and perceived usefulness, benefits, or comparative advantage in the adoption of digital technology has been identified as a driver of innovation adoption (Nwankwo, 2022). As with other academic theories, the theory has its detractors, despite its valid propositions regarding the adoption of digital technologies within organisations. It suffices to say that the adoption of digital technologies in an organisation is influenced by a variety of other factors besides user perception. Among the factors are internal organisational requirements and structure, external environment and forces, and government policies (Adenekan and Jimoh, 2021).

V. METHODOLOGY

Utilising questionnaires to collect primary data, the study employed a quantitative research methodology. Utilising statistical tools (STATA/SPSS) in addition to charts, diagrams, and tables, among others, the data collected were examined and interpreted.

A. Description of Study Area

The area of study is Federal University in Kashere. The university was founded in 2011 and is located in Nigeria's Gombe State, Kashere Akko Local Government Area. According to the university's website, it has five faculties: The Faculty of Agriculture, the Faculty of Education, the Faculty of Humanities and Social Sciences, the Faculty of Management Sciences, and the Faculty of Science (Federal University, Kashere, 2022). There is also a School of Postgraduate Studies at the University.

B. Data Collection

The primary data for that study was collected via questionnaires distributed to employees of Federal University, Kashere. The questionnaires were distributed at random to academic and non-academic university staff. The academic staff include teaching personnel of all cadres. The university's non-academic staff include Registry and Bursary staff members.

The study adopted the Proportionate Stratified Random Sampling using Yaro Yemen's Formula, $n = \frac{N}{1+N(E)^2}$ to determine the sample size for this study (Emaikwu, 2012: 88). Using the formula will saved the researcher the tendency of manipulating the procedure, thereby allowing an objective outcome of the study.

$$\text{The adopted formula is } n = \frac{N}{1+N(E)^2}$$

Where:

n = the sample size required

N = the study population size

E = the level of significance = 5% (0.05)

$$\text{Hence, } n = \frac{798}{1+798(0.05)^2} \quad n = \frac{798}{2.995} \quad n = 266$$

Therefore, 266 questionnaires were distributed for the study.

C. Data Analysis

Statistical tools such as frequency counts and percentages were used for the analysis of the data from the questionnaires. These tools included frequencies, tables, and simple percentages in the presentation and analysis of the data collected from the questionnaires. The analyses were carried out using the STATA and Statistical Package for Social Sciences (SPSS) software, for definite accuracy in the analysis.

The simple percentage formula used is as follows:

$$\frac{NR \times 100}{NP}$$

Where:

NR = total number of respondents

NP = population sampled

100 = percentage response

VI. DATA PRESENTATION AND ANALYSES

The Background information of the respondents is presented under this section.

Table 1: Gender Distribution of Respondents

Options	Percentage (%)	Count
Female	31.94	23
Male	68.06	49
No Answer	-	5

Source: Research data from distributed questionnaires, 2023.

The results on Table 1 indicate that a total of 23 female respondents representing 31.9% of the total response on gender distribution of respondents participated in the survey, while a total of 49 male respondents representing 68.1% of the total response on gender distribution of respondents

participated in the survey. However, 5 respondents did not indicate their age range. This implies that response include more of the experiences among male staff in Federal University Kashere, than those of female staff.

Table 2: Distribution of Respondents Job Roles

Options	Percentage (%)	Count
Academic Staff	31.94	23
Administrative Staff	34.72	25
Technical Staff	9.72	7
Others	23.61	17
No Answer	-	5

Source: Research data from distributed questionnaires, 2023

The results on Table 2 indicate that 23 respondents, accounting for 31.9% of all the response are academic staff. A total of 25 respondents accounting for 34.7% of all the response are administrative staff. A total of 7 respondents accounting for 9.7% of all the response are technical staff. A total of 17 respondents accounting for 23.6% of all the

response fall within other categories of staffing in Federal University, Kashere. However, 5 respondents did not indicate their work roles. This implies that majority of the data collected capture the experiences of academic and administrative staff of Federal University, Kashere.

Table 3: Distribution of Respondents Years of Work Experience

Options	Percentage (%)	Count
1 – 5 years	40.85	29
6 – 10 years	32.39	23
11 – 15 years	18.31	13
16 – 20 years	4.23	3
Above 20 years	4.23	3
No Answer	-	6

Source: Research data from distributed questionnaires, 2023.

The results on Table 3 indicate that 29 respondents, with 40.8% of total response have work experience with Federal University, Kashere for a range of 1 to 5 years. A total of 23 respondents, with 32.4% of total response have work experience with Federal University, Kashere for a range of 6 to 10 years. A total of 11 respondents, with 18.3% of total response have work experience with Federal University, Kashere for a range of 11 to 15 years. A total of 3 respondents,

with 4.23% of total response have work experience with Federal University, Kashere for a range of 16 to 20 years. A total of 3 respondents, with 4.23% of total response have work experience with Federal University, Kashere for over 20 years. However, 6 respondents did not indicate their years of work experience. This implies that the data staff of Federal University, Kashere who are actively in service with the university at the time the survey was conducted.

Table 4: Digital Technology Requirement for Work in Federal University, Kashere

Options	Percentage (%)	Count
Strongly Agree	46.75	36
Agree	53.25	41
Neutral	0.00	0
Disagree	0.00	0
Strongly Disagree	0.00	0

Source: Research data from distributed questionnaires, 2023.

The results on Table 4 indicate that 36 respondents making 46.8% of total response strongly agree that digital technology equipments and knowledge are required for their work. A total of 41 respondents making 53.2% of total response agree that digital technology equipments and

knowledge are required for their work. No respondent was neutral or did not accept that digital technology equipments and knowledge are required for his or her work in Federal University, Kashere.

Table 5: Digital Technology Equipments Usage for Work

Options	Percentage (%)	Count
Strongly Agree	37.33	28
Agree	49.33	37
Neutral	10.67	8
Disagree	2.67	2
Strongly Disagree	0.00	0
No Response	-	2

Source: Research data from distributed questionnaires, 2023.

The results on Table 5 indicate that 28 respondents making 37.3% of total response strongly agree that digital technology is being used for their work. A total of 37 respondents making 49.3% of total response agree that digital technology is being used for their work. A total of 8 respondents making 10.7% of total response neutral on the

use of digital technology for their work. A total of 2 respondents making 2.6% of total response disagree that digital technology is being used for their work. No respondent strongly disagree that digital technology is being used for his or her work in Federal University, Kashere.

Table 6: Provision of Digital Technology Equipments by the Institution

Options	Percentage (%)	Count
Strongly Agree	16.00	12
Agree	34.67	26
Neutral	14.67	11
Disagree	32.00	24
Strongly Disagree	2.67	2
No Answer	-	2

Source: Research data from distributed questionnaires, 2023.

The results on Table 6 indicate that 12 respondents making 16.0% of total response strongly agree that digital technology equipments are provided by the institution. A total of 26 respondents making 34.7% of total response agree that digital technology equipments are provided by the institution. A total of 11 respondents making 16.7% of total response are neutral on the provision of digital technology equipments for

their work. A total of 24 respondents making 32.0% of total response disagree that digital technology equipments are provided by the institution. A total of 2 respondents making 2.67% of total response strongly disagree that digital technology equipments are provided by Federal University, Kashere.

Table 7: Availability of Digital Technology Equipments Usage Support Staff

Options	Percentage (%)	Count
Strongly Agree	9.33	7
Agree	24.00	18
Neutral	40.00	30
Disagree	16.00	12
Strongly Disagree	10.67	8
No Answer	-	2

Source: Research data from distributed questionnaires, 2023.

The results on Table 7 indicate that 7 respondents making 9.3% of total response strongly agree that there are support staff to help in the use of digital technology equipments at their work. A total of 18 respondents making 24.0% of total response agree that there are support staff to help in the use of digital technology equipments at their work. A total of 30 respondents making 40.0% of total response are neutral on the availability of support staff to help

in the use of digital technology equipments at their work. A total of 12 respondents making 16.0% of total response disagree that there are support staff to help in the use of digital technology equipments at their work. A total of 8 respondents making 9.3% of total response strongly disagree that there are support staff to help in the use of digital technology equipments at their work in Federal University, Kashere.

Table 8: Digital Technology Adoption and Increase in Work Performance

Options	Percentage (%)	Count
Strongly Agree	63.16	48
Agree	32.89	25
Neutral	2.63	2
Disagree	1.32	1
Strongly Disagree	0.00	0
No Answer	-	1

Source: Research data from distributed questionnaires, 2023.

The results on Table 8 indicate that 48 respondents making 63.2% of total response strongly agree that digital technology adoption increases their work performance. A total of 25 respondents making 32.9% of total response agree that digital technology adoption increases their work performance. A total of 2 respondents making 2.63% of total response are neutral on digital technology adoption

increasing their work performance. Only 1 respondent making 1.32% of total response disagrees that digital technology adoption increases his or her work performance. None of the respondents strongly disagrees that digital technology adoption increases their work performance in Federal University, Kashere.

Table 9: Digital Technology Adoption in Federal University, Kashere

Options	Percentage (%)	Count
Strongly Agree	28.95	22
Agree	50.00	38
Neutral	13.16	10
Disagree	5.26	4
Strongly Disagree	2.63	2
No Answer	-	1

Source: Research data from distributed questionnaires, 2023.

The results on Table 9 indicate that 22 respondents making 28.9% of total response strongly agree that digital technology has been adopted for work in the institution. A total of 38 respondents making 50.0% of total response agree that digital technology has been adopted for work in the institution. A total of 10 respondents making 13.2% of total response are neutral on digital technology being adopted in

the institution. A total of 4 respondents making 5.26% of total response disagree that digital technology has been adopted for work in the institution. A total of 2 respondents making 2.63% of total response strongly disagree that digital technology has been adopted for work in Federal University, Kashere.

Table 10: Knowledge of Operating Digital Technology Equipments

Options	Percentage (%)	Count
Strongly Agree	41.33	31
Agree	32.00	24
Neutral	22.67	17
Disagree	4.00	3
Strongly Disagree	0.00	0
No Answer	-	2

Source: Research data from distributed questionnaires, 2023.

The results on Table 10 indicate that 31 respondents making 41.3% of total response strongly agree that they have knowledge of operating digital technology equipments at work. A total of 24 respondents making 32.0% of total response agree that they have knowledge of operating digital technology equipments at work. A total of 17 respondents making 22.7% of total response are neutral on having the knowledge of operating digital technology equipments at

work. A total of 3 respondents making 4.0% of total response disagree that they have knowledge of operating digital technology equipments at work. No respondent strongly disagreed that he or she does not have the knowledge of operating digital technology equipments at work. A total of 2 respondents did not provide any information on having the knowledge of operating digital technology equipments at work.

Table 11: Institutional Digital Technology Adoption Policy

Options	Percentage (%)	Count
Strongly Agree	10.53	8
Agree	36.84	28
Neutral	30.26	23
Disagree	21.05	16
Strongly Disagree	1.32	1
No Answer	-	1

Source: Research data from distributed questionnaires, 2023.

The results on Table 11 indicate that 8 respondents making 10.5% of total response strongly agree that the institution has a digital technology adoption policy. A total of 28 respondents making 36.8% of total response agree that the institution has a digital technology adoption policy. A total of 23 respondents making 30.3% of total response are neutral on

the institution having a digital technology adoption policy. A total of 16 respondents making 21.1% of total response disagree that the institution has a digital technology adoption policy. Only 1 respondent making 1.32% of respondent strongly disagreed that the institution has a digital technology adoption policy.

Table 12: Institutional Training on the Use of Digital Technology at Work

Options	Percentage (%)	Count
Strongly Agree	12.33	9
Agree	31.51	23
Neutral	19.18	14
Disagree	28.77	21
Strongly Disagree	8.22	6
No Answer	-	4

Source: Research data from distributed questionnaires, 2023.

The results on Table 12 indicate that 9 respondents making 12.3% of total response strongly agree that the institution trains its staff on the use of digital technology equipments. A total of 23 respondents making 31.5% of total response agree that the institution trains its staff on the use of digital technology equipments. A total of 14 respondents making 19.2% of total response are neutral on the institution

training its staff on the use of digital technology equipments. A total of 21 respondents making 28.8% of total response disagree that the institution trains staff on the use of digital technology equipments. A total of 6 respondents making 8.2% of respondent strongly disagree that the institution trains its staff on the use of digital technology equipments.

Table 13: Institutional Usage of Digital Technology since Inception

Options	Percentage (%)	Count
Strongly Agree	14.71	10
Agree	30.88	21
Neutral	20.59	14
Disagree	4.41	3
Strongly Disagree	0.00	0
No Answer	-	9

Source: Research data from distributed questionnaires, 2023

The results on Table 13 indicate that 10 respondents making 14.7% of total response strongly agree that the institution has been using digital technology since inception. A total of 21 respondents making 30.8% of total response agree that the institution has been using digital technology since inception. A total of 14 respondents making 20.6% of total response are neutral on the institution using digital

technology since inception. A total of 20 respondents making 29.4% of total response disagree that the institution has been using digital technology since inception. A total of 3 respondents making 4.4% of respondents strongly disagree that the institution has been using digital technology since inception.

Table 14: Level of Digital Technology Adoption in the Institution

Options	Percentage (%)	Count
Strongly Agree	10.39	8
Agree	61.04	47
Neutral	18.18	14
Disagree	10.39	8
Strongly Disagree	0.00	0

Source: Research data from distributed questionnaires, 2023.

The results on Table 14 indicate that 8 respondents making 10.4% of total response strongly agree that there is a significant level of digital technology adoption in the institution. A total of 47 respondents making 61.0% of total response agree that there is a significant level of digital technology adoption in the institution. A total of 14 respondents making 18.2% of total response are neutral on

the institution having a significant level of digital technology adoption. A total of 8 respondents making 10.4% of total response disagree there is a significant level of digital technology adoption in the institution. No respondents strongly disagree that there is a significant level of digital technology adoption in the institution.

Table 15: Relationship between Digital Technology Adoption and Staff Productivity

Options	Percentage (%)	Count
Strongly Agree	42.86	33
Agree	37.66	29
Neutral	12.99	10
Disagree	3.90	3
Strongly Disagree	2.60	2

Source: Research data from distributed questionnaires, 2023.

The results on Table 15 indicate that 33 respondents making 42.9% of total response strongly agree that there is a relationship between digital technology adoption and staff productivity in the institution. A total of 29 respondents making 37.7% of total response agree that there is a relationship between digital technology adoption and staff productivity in the institution. A total of 10 respondents making 13.0% of total response are neutral if there is a relationship between digital technology adoption and staff productivity in the institution. A total of 3 respondents making 3.9% of total response disagree that there is a relationship between digital technology adoption and staff productivity in the institution. A total of 2 respondents making 2.6% of total response strongly disagree that there is a relationship between digital technology adoption and staff productivity in the institution.

VII. TEST OF HYPOTHESIS

The research hypothesis which will be tested by this study were given as follows:

- H₀: There is significant relationship between digital technology adoption and staff productivity in Federal University, Kashere.
- H₁: There is no significant relationship between digital technology adoption and Staff productivity in Federal University, Kashere.
- The hypothesis will be tested on the basis of question number 17 of the questionnaires distributed for the study, which says, “there is a significant level of digital technology adoption in your institution.

The data collected from the question is presented below:

Table 16: The data collected

	Affirmative	Negative	Undecided	Total
Number of respondents	62	5	10	77

From the data collected, 80.5 percent responded in the affirmative, 6.5 percent responded negatively, and 13.0 percent were undecided.

Equivalently, H₀: Distribution of responses is 0.805, 0.065, 0.130.

H₁: H₀ is false. α = 0.05

Test formula is:

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

The null hypotheses represents “no significance.”

H₀: p₁=0.805, p₂=0.065, p₃=0.130.

Decision rule for χ^2 test is determined by the level of degree of freedom defined as:

(df) = k-1, where k is the number of response category.

If null hypothesis is true, observed and expected frequencies will be close in value and the χ^2 statistic will be close to zero.

If the null hypothesis is false, the χ^2 statistic will be large.

Critical values can be found in the table of probabilities for the χ^2 distribution.

Therefore, df=k-1 = 3 – 1 = 2 and level of significance in 5%.

Appropriate critical value is 5.99.

Hence, decision rule is: Reject H_0 if $\chi^2 \geq 5.99$.

Table 17: Decision rule

	Affirmative	Negative	Undecided	Total
Observed frequencies (O)	62	5	10	77
Expected frequencies (E)	77 (0.805) = 61.99	77 (0.065) = 5.01	77 (0.130) = 10.00	77

$$\text{Therefore, } \chi^2 = \sum \frac{(O-E)^2}{E}$$

$$\chi^2 = \frac{(62-61.99)^2}{61.99} + \frac{(5-5.01)^2}{5.01} + \frac{(10-10.00)^2}{10.00}$$

$$\chi^2 = 0.0000016 + 0.00002 + 0 = 0.0000216$$

We accept H_0 because $0.0000216 \leq 5.99$.

Statistically, there is significant evidence at $\alpha = 0.05$ to show that H_0 is true.

Therefore, statistically it is true that there is significant relationship between digital technology adoption and staff productivity in Federal University, Kashere.

VIII. DISCUSSION OF FINDINGS

The debate on ICT adoption and employee performance has been an essential issue among scholars from various backgrounds. This has been an extension of the debate on employee performance. Earlier analyses have focussed on financial institutions for their keen interest in technology adoption in the search for enhanced employee performance. However, the academia is not left out in the adoption of ICT for the various task requirements therein. Hence, the role of ICT adoption on employees' performance in various institutions of learning has attracted scholarly examination, (Ghavifekr and Rosdy, 2015: 175 – 191). Existing analyses cut across various levels of academic institutions, from elementary to tertiary institutions. It is worthy to note that the academia is a distinct work environment due to the complex, diverse, and yet interrelated job roles found therein. Yet, existing treatises tended to pay attention to academic roles in the context of employee performance due to ICT adoption. Equally, a spatial gap existed in the body of literature on the subject matter, as the phenomenon in the northern part of Nigeria has not been given the required attention. Hence, this study attempted to fill the existing gap by examining the phenomenon in northern Nigerian institutions using the case of Federal University, Kashere.

The findings of this study indicate that ICT adoption has an effective significance on staff performance in Federal University, Kashere, regardless of gender composition. This extends the position of Ghavifekr and Rosdy (2015), who

observed that ICT-based teaching and learning is more effective in comparison with traditional classroom pedagogical processes. This is no doubt, due to the functions which using ICT tools and equipment “prepare an active learning environment that is more interesting and effective for both teachers and students” (Ghavifekr and Rosdy, 2015: 188). These findings correspond with the position of Macho (2005) that proved the use of ICT in education enhances students' learning. Students learning and learning outcomes are essential features of academic staff performance in Federal University, Kashere. Essentially, the situation buttressed the perceived usefulness and perceived ease-of-use of ICT tools as argued in the Technology Acceptance Model proposed by Fred Davis (Davis, 1989). As a theory, the Technology Acceptance Model opined that perceived usefulness as employee's belief that the adoption of a specific machine or technology would improve their performance on one hand, and on the other hand, perceived ease-of-use which employees believe they could use machines with little or no effort, to complete tasks effectively and efficiently, were the drivers for the adoption and utilisation of ICT in Federal University, Kashere. Hence, the findings of this research conformed to the Technology Acceptance Model.

However, achieving improved students learning with the use of ICT tools and equipment requires effective and efficient classroom management from academic staff on one hand, and on the other hand, good classroom and learning conduct among students. Findings by Zhang (2013) buttressed ICT use in EFL Teaching and Learning in Northwest China, showing that teachers have positive attitude for the use of ICT in teaching and research, as research is integral to their performance measurement. This is equally true of Federal University, Kashere, since inception as ICT usage has been adopted in the university since inception in 2012. The role of ICT in enhancing easy research, teaching, and learning cannot be over emphasised, expatiates Chapelle (2011).

Apart from the academic section of staff and work in Federal University, Kashere, non-academic staff also make use of ICT tools and equipment to carry out their various assignments effectively and efficiently. This is a common feature in tertiary institutions of learning, explains Ogba and Igu (2013). Specifically, non-teaching staff including Bursary Unit staff and registry staff use ICT tools and equipment to

perform their respective work for the progress of the university. The work performed by these staff include data processing and printing by administrative support staff; financial computation and administration by bursary staff; cataloguing and support by library staff; and programming and networking, among other work roles by ICT Unit staff. However, these staff as well as their academic colleagues need constant training and support to be able to perform beyond expectations on the job. It is pertinent to note that while other university staff like drivers, gardeners, and janitors do not necessarily need ICT tools in carrying out their assigned duties, some ICT skills are essential for enhancing their work both by themselves and by the institution. While the staff need surfing and networking skills for self-learning and easy communication, the institution needs the skills and tools of monitoring like CCTV camera and personnel logging in machines to monitor the punctuality of the staff for the purpose of higher staff performance.

Empirical findings by Shehu, Ibrahim, and Muhammad (2023: 1 - 17), indicate that the adoption and use of ICT in universities depend on many factors, including social influence, access to resources, effort expectancy, and technical support, among others. While these factors seemed to be addressed in Federal University, Kashere, there is the need for internal periodic assessment and evaluation for more effective outcome. There is also the need for the provision of more access to ITC tools and equipment by the university for its staff.

IX. CONCLUSION

University staff roles play determines the extent of staff utilisation ICT resources for various university work demand including teaching, research, financial computations, and records management in universities. The work roles and demands determine staff interaction with ICT tools in the university. While the adoption of ICT is mostly an institutional affair, the utilisation of ICT tools for effective and efficient staff performance. However, the contribution of lecturers' educational qualification, rank, gender and age in influencing the utilisation of adopted ICT resources in the university remains an issue of nuance debate among scholars. In the long run, this will lead to the actualisation of Nwankwo's position while expatiating Fred Davis' Technology Acceptance Model, when he observed that the significance of perceived ease of use and perceived usefulness, benefits, or comparative advantage in the adoption of digital technology is the driver of innovation adoption as well as ICT adoption at work (Nwankwo, 2022). Pertinently, this study has contributes to the continuous scholarly debate on the impact and influence of the utilisation of ICT resources on staff performance in institutions of higher education, using the case of Federal University, Kashere. Therefore, this study will serve as a reference material to support further related research.

X. RECOMMENDATIONS

Arising from the findings and conclusion of the study, the following recommendations are made.

- Adequate ICT tools, equipments and training should be made available for the staff of Federal University, Kashere.
- Adequate ICT support staff should be made available in Federal University, Kashere, as their services will always be needed by other staff members of the university.
- The staff of Federal University, Kashere should be conscientised on the ICT adoption and utilisation framework(s) of the university.
- Federal University Kashere should encourage and ensure ICT literacy and utilisation among its staff across levels.

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