# Digital Workflow Automation and Staff Productivity in Selected Public Tertiary Institutions in Delta State, Nigeria

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#### Abstract

The study investigated Digital Workflow Automation and Staff Productivity in Selected Public Tertiary Institutions in Delta State, Nigeria. Three questions were asked leading to the formulation of three hypotheses to guide the study. A descriptive survey design was employed, with a population of 2150, the sample size of 337 obtained using the taro Yemenis techniques. The instrument used was questionnaires distributed across five tertiary institutions, including three state universities, one polytechnic, and one college of education. A total of 288 completed questionnaires were returned, representing an 86% response rate. Data were analyzed using multiple regression analysis with the aid of SPSS. The findings reveal that SDL has a negative impact on productivity, CCA positively affects productivity, and MISS also negatively impacts productivity. These results suggest that while digital literacy is important, its direct application in enhancing productivity may require better integration and context-specific adaptation. On the other hand, adaptability to change and management support are key drivers of productivity. Based on these findings, the study recommends enhancing digital literacy programmes by making them role-specific, fostering a culture of adaptability to digital change through change management strategies, and improving the management's infrastructure and technical support systems to better align with productivity goals.

**Keywords**: Digital Workflow Automation, Staff Productivity, Digital Literacy, Change Adaptability, Management Support.

#### **INTRODUCTION**

In the modern era of digital transformation, public sector institutions are increasingly embracing digital workflow automation as a strategy for enhancing operational efficiency and service delivery. Workflow automation involves the use of technology to streamline, manage, and execute tasks with minimal human intervention. In tertiary institutions, especially public universities, this can translate into faster administrative processes, improved staff coordination, and reduced bureaucratic delays. Digital workflow systems are now central to academic administration, finance, human resources, and communication across institutional departments (Komba & Mlozi, 2022).Despite the widespread global integration of automation tools, many public tertiary institutions in Nigeria continue to grapple with inefficiencies in administrative processes. Manual handling of data and documents, lack of digital infrastructure, and resistance to technological change remain significant barriers. The gap between technology availability and actual usage has been linked to low digital literacy among staff, poor change management strategies, and limited infrastructural support from management (Adeleke & Olamide, 2021). As a result, staff productivity suffers due to repetitive tasks, communication lags, and workflow redundancies.

A critical factor influencing the success of digital workflow automation is staff digital literacy. The ability of employees to effectively use digital platforms determines the extent to which

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these systems can positively impact productivity. Staff members with adequate digital competencies are more likely to adopt automation tools, navigate systems efficiently, and contribute to a tech-driven institutional culture (Okonkwo & Oduguwa, 2023). Conversely, a lack of skills can create digital fatigue, resistance, and underutilization of automation tools. Another important dimension is change conscientiousness adaptability — the readiness and willingness of staff to embrace new systems and workflows. Studies have shown that digital transformation efforts fail not just due to technical limitations, but because of human factors such as fear of change, poor communication, and lack of motivation (Onwudiwe & Uche, 2022). In public institutions where change is often met with resistance, effective strategies to improve adaptability are crucial to achieving meaningful productivity gains.

Not out of point that management infrastructural support plays a pivotal role in the successful implementation of digital workflow systems. The provision of reliable internet, up-to-date software, and technical support services are necessary enablers of staff productivity in a digitized environment. Without consistent support from institutional leadership, even the most sophisticated automation tools can fail to yield desired outcomes (Ahmed, Musa, & Ibrahim, 2023). This study, therefore, seeks to examine how digital workflow automation—mediated by staff digital literacy, change adaptability, and management infrastructural support—affects staff productivity in selected public tertiary institutions in Delta State (TIDS), Nigeria.

# **Statement of problem**

Despite the growing global adoption of digital workflow automation as a tool for enhancing efficiency in institutional operations, many public (TIDS), Nigeria, continue to experience persistent administrative bottlenecks, delays, and inefficiencies that negatively impact staff productivity. While automation has the potential to streamline tasks, reduce manual errors, and improve turnaround time, its effectiveness is often undermined by several interrelated factors. These include low levels of staff digital literacy, limited adaptability to technological changes, and inadequate infrastructural and management support systems. In many cases, staff struggle to effectively utilize digital platforms due to a lack of training, resistance to new processes, or insufficient access to reliable digital tools. Furthermore, the absence of a coordinated institutional framework to support digital transformation efforts means that automation tools are either underutilized or poorly integrated into existing workflows. As a result, the anticipated productivity gains from digital workflow automation remain largely unrealized. This study therefore seeks to investigate the effect of staff digital literacy, change conscientiousness adaptability, and management infrastructural support systems on staff productivity in selected public (TIDS).

#### **Objective of the study**

The main objective of this study is to examine the effect of digital workflow automation on staff productivity in selected public tertiary institutions in Delta State, Nigeria, while the specific objectives of the study are to:

- i. determine the effect of staff digital literacy on staff productivity in selected public tertiary institutions.
- ii. examine the effect of change conscientiousness adaptability on staff productivity in selected public tertiary institutions.
- iii. assess he effect of management infrastructural support systems on staff productivity in selected public tertiary institutions.

#### **Research questions**

The following questions were asked for the study:

i. What is the effect of staff digital literacy on staff productivity in selected public (TIDS)?

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- ii. What is the effect of change conscientiousness adaptability on staff productivity in selected public (TIDS)?
- iii. What is the effect of management infrastructural support system on staff productivity in selected public (TIDS)?

# **Research Hypotheses**

Based on the question asked the following hypotheses were formulated and stated in null form:

- Ho1: Staff digital literacy has no significant effect on staff productivity in selected public (TIDS).
- H<sub>02</sub>: Change conscientiousness adaptability has no significant effect on staff productivity in selected public (TIDS).
- H<sub>03</sub>: Management infrastructural support system has no significant effect on staff productivity in selected public (TIDS).

# Significance of the study

This study is significant as it provides valuable insights into how digital workflow automation can be leveraged to improve staff productivity in public (TIDS), Nigeria. By examining key factors such as staff digital literacy, change conscientiousness adaptability, and management infrastructural support systems, the research offers a comprehensive understanding of the enablers and barriers to successful digital transformation in academic institutions. The findings will benefit institutional policymakers, administrators, and IT departments by guiding the development of targeted strategies for digital skills training, change management, and infrastructure investment. Additionally, the study contributes to the growing body of knowledge on digital transformation in the education sector, serving as a useful reference for researchers, government agencies, and development partners interested in enhancing public sector efficiency through technology.

#### **REVIEW OF RELATED LITERATURE**

The conceptualization of this study is grounded in the evolving discourse on the integration of digital technologies within institutional workflows, particularly in the context of public tertiary education. Digital workflow automation refers to the use of digital systems to streamline, coordinate, and execute routine administrative tasks, thereby enhancing efficiency and reducing manual effort (Komba & Mlozi, 2022). As institutions strive to modernize their operations, attention has increasingly shifted toward understanding how variables such as staff digital literacy, adaptability to change, and infrastructural support influence the successful implementation and outcomes of digital initiatives. Staff productivity, in this context, is viewed not only as output or performance metrics but also in terms of improved time management, task accuracy, and service delivery (Okonkwo & Oduguwa, 2023). These concepts form the basis of this study's framework, emphasizing the interplay between technological adoption and human readiness in achieving institutional goals through digital transformation. Understanding these constructs is critical for developing effective strategies for digital transition in the public education sector (Ahmed, Musa, & Ibrahim, 2023).

#### **Concept of Staff Digital Literacy**

Staff digital literacy refers to the ability of employees to effectively use digital technologies, platforms, and tools to perform tasks, solve problems, communicate, and collaborate in the workplace. In the context of higher education institutions, this encompasses skills such as using office applications, managing digital files, engaging with institutional platforms (e.g., Learning Management Systems, HR portals), and navigating digital communication tools. The increasing digitization of administrative and academic workflows requires staff to be not only

functionally competent in using these tools but also confident and adaptable to emerging technologies (Eze & Iloanusi, 2023). As institutions adopt digital workflow systems, staff digital literacy becomes a foundational prerequisite for achieving improved performance and operational efficiency.

Digital literacy goes beyond basic computer skills to include critical thinking about digital content, cybersecurity awareness, and the ethical use of information technology. Staff members who possess high levels of digital literacy are more likely to embrace workflow automation systems, troubleshoot basic IT issues, and adopt digital solutions that enhance productivity. Conversely, limited digital competencies may lead to resistance, errors, and underutilization of available digital resources. This challenge is particularly evident in many Nigerian public tertiary institutions, where digital training opportunities for staff are often inadequate or sporadic (Onwuchekwa & Abah, 2022). Bridging the digital skill gap is therefore essential for enabling successful digital transformation initiatives.

Recent research highlights that investing in digital literacy through continuous professional development has a significant effect on staff performance and institutional outcomes. For instance, a study by Adeyemi and Ogunlade (2023) found a positive correlation between digital literacy and administrative efficiency in public universities across southern Nigeria. Staff with enhanced digital skills demonstrated better time management, increased accuracy in reporting, and greater responsiveness to digital tasks. As such, digital literacy is not only a personal asset but also a strategic institutional resource that can drive innovation, transparency, and productivity within the education sector.

# **Concept of Change Conscientiousness Adaptability**

Change conscientiousness adaptability refers to the extent to which individuals are mentally prepared, willing, and capable of adjusting to organizational changes, especially those involving new technologies or workflows. In the context of public tertiary institutions, this concept reflects the ability of staff to embrace innovations such as digital workflow automation with minimal resistance. Adaptability includes cognitive flexibility, emotional openness, and behavioural readiness to adopt new processes (Nwachukwu & Olumide, 2022). When institutions undergo digital transformation, staff who possess a conscientious attitude toward change are more likely to contribute positively to implementation efforts, engage in learning, and support institutional objectives.

Organizational change, particularly when it involves automation and digital platforms, often meets with resistance if individuals feel threatened, unprepared, or unsupported. Change conscientiousness serves as a buffer against such resistance, promoting resilience, proactive learning, and collaborative participation in new systems. Studies have shown that adaptable employees are better at managing transition-related stress and tend to perform better during periods of institutional restructuring or digital upgrades (Ibrahim & Adebayo, 2023). In educational institutions, where traditional methods have long been entrenched, fostering a culture of adaptability is crucial to ensure that staff do not just comply with, but also champion, digital transformation initiatives.

Moreover, the success of automation projects is strongly influenced by how well staff adapt to change at both the individual and team levels. Training, communication, and leadership support are all factors that contribute to building change adaptability. According to recent findings by Ojo and Akinyemi (2023), institutions that implemented change readiness programs experienced smoother transitions and higher productivity outcomes. Their study emphasizes that beyond technical implementation, institutions must address the human side of change. As such, change conscientiousness adaptability is a vital human resource trait that not only enhances productivity but also ensures sustainability and long-term success of digital initiatives.

# **Concept of Management Infrastructural Support System**

Management infrastructural support system refers to the strategic provision and maintenance of physical, digital, and organizational infrastructure by institutional leadership to facilitate efficient work processes and the achievement of organizational goals. In the context of digital workflow automation, this includes reliable internet access, up-to-date hardware and software, technical support services, and responsive IT policies that ensure smooth operations. Effective infrastructural support from management is essential to enable staff to perform their duties efficiently and to ensure that technological tools are not only available but also functional and accessible (Okafor & Suleiman, 2022). Without such support, even the best automation strategies can fail due to systemic inefficiencies or technical disruptions.

Furthermore, management plays a critical role in creating an enabling environment that supports innovation, flexibility, and technological adoption. This includes budgeting for regular infrastructure upgrades, offering training and professional development, and setting policies that encourage digital use. According to Ogundele and Ebhohimen (2023), institutions with strong infrastructural support systems show higher levels of employee engagement, satisfaction, and productivity. Their study revealed that staff members are more likely to adopt digital workflow tools when they are confident that management will provide the necessary infrastructure and respond quickly to technical challenges.

Inadequate management support can result in low morale, increased downtime, and reluctance to embrace change, especially in environments where digital tools frequently malfunction or are poorly maintained. Conversely, when institutional leaders prioritize infrastructural development and provide consistent technical backing, it signals organizational readiness and commitment to digital transformation. Uche and Danjuma (2023) emphasize that infrastructural support is not limited to physical resources but also includes managerial attitude, policy consistency, and communication strategies that build staff trust and cooperation. Therefore, management infrastructural support is not only a technical necessity but also a strategic tool for enhancing staff productivity and institutional performance in the digital age.

# **Concept of Staff Productivity**

Staff productivity refers to the efficiency and effectiveness with which employees perform their assigned duties, contributing to the overall goals of an organization. In tertiary institutions, particularly in public settings, productivity encompasses both the quantity and quality of output – ranging from timely administrative tasks to effective academic support and service delivery. It is typically measured through indicators such as task completion rates, adherence to deadlines, work accuracy, and responsiveness to institutional demands (Eze & Nwosu, 2022). Productivity is influenced by several internal and external factors, including skills, motivation, technology, work environment, and institutional support systems.

In the digital age, the concept of productivity is closely tied to the availability and usage of digital tools that automate routine tasks and facilitate seamless communication. Staff who are digitally equipped and work within an environment that supports innovation tend to achieve higher productivity due to reduced workload duplication, fewer errors, and improved task coordination (Ibrahim & Ogundipe, 2023). Moreover, the integration of digital workflow automation allows staff to focus on more strategic and value-adding functions, shifting efforts from repetitive, manual processes to performance-driven outcomes. This is particularly significant in educational institutions, where effective administrative processes are essential to supporting teaching, learning, and research activities.

Furthermore, staff productivity is also a reflection of institutional leadership, organizational culture, and staff well-being. When employees feel supported through training, technological investment, and fair management practices, they are more likely to be engaged and committed to their roles. According to Adeola and Okon (2023), motivation, digital competence, and

infrastructural readiness were among the top predictors of high staff productivity in public universities in southern Nigeria. Their study emphasized that productivity is not merely about output volume, but about value creation, innovation, and goal alignment. Thus, for institutions aiming to enhance performance and service delivery, staff productivity must be viewed as a multidimensional construct influenced by both individual and systemic factors.



Fig. 1: Conceptual framework of Digital workflow automation and staff productivity (Source: Researcher's Concept, 2025)

The conceptual framework presented showcases the relationship between factors influencing staff productivity within an organization, with a focus on "Digital Workflow Automation." The framework identifies three independent variables that collectively shape the dependent variable-staff productivity. Firstly, Staff Digital Literacy refers to employees' ability to effectively use digital tools and technologies to carry out their tasks. This competency serves as the foundation for successful digital workflow automation, as literate staff are better equipped to adapt to and leverage automated systems, resulting in streamlined processes and improved productivity. Secondly, Change Conscientiousness and Adaptability highlights employees' responsiveness to change and their ability to embrace innovations in the workplace. As organizations adopt digital transformation, adaptability becomes crucial. Staff who are conscientious about changes and adaptable to new tools and processes are more likely to experience smoother transitions, reducing disruptions and maximizing output. Lastly, Management Infrastructural Support Systems encompass the resources, policies, and leadership strategies provided by management to facilitate workflow automation. This variable underscores the importance of having robust infrastructural support, such as reliable hardware, software, and ongoing training programs, to empower employees and remove barriers to productivity.

Together, these three factors form a cohesive framework showing how improvements in digital literacy, adaptability, and managerial support drive greater staff productivity in a digitally

automated work environment. It emphasizes the interdependence of human and organizational efforts in achieving operational excellence through digital transformation

#### **Theoretical review**

This study is anchored on the Technology Acceptance Model (TAM), developed by Davis (1989), which has remained a foundational framework for understanding how individuals adopt and use new technologies. The TAM posits that two key factors—Perceived Usefulness (PU) and Perceived Ease of Use (PEOU)—influence an individual's intention to use a technology, which subsequently affects actual usage behaviour. In the context of digital workflow automation in public tertiary institutions, TAM provides a useful lens through which to examine how staff members' digital literacy, adaptability to change, and the infrastructural support provided by management shape their willingness and ability to effectively utilize automated systems. Recent studies have reaffirmed TAM's relevance in educational settings, noting that the presence of a supportive infrastructure and positive user perceptions significantly enhance technology adoption and, by extension, staff productivity (Adeniran & Bello, 2022; Okeke & Hassan, 2023). Thus, this theory aptly supports the objectives of this study by linking technological, behavoural, and organizational factors to outcomes such as productivity and performance.

# **Empirical Review**

Eze and Nwosu (2022) investigated the relationship between digital literacy and staff productivity in Nigerian public universities. The study employed a quantitative research design and used a stratified random sampling technique to select a sample of 300 administrative and academic staff from three public universities. Data were collected using a structured questionnaire and analyzed using descriptive and inferential statistics. The findings revealed a significant positive relationship between staff digital literacy and productivity. Specifically, staff with higher digital literacy levels exhibited improved task completion, reduced errors, and greater satisfaction in performing administrative and academic duties. The study emphasized the need for continuous digital skills development programs to enhance staff productivity in higher education institutions.

Ogundele and Ebhohimen (2023) examined the role of change conscientiousness adaptability in the successful adoption of digital workflow automation in Nigerian public universities. This study used a mixed-methods research design, combining both quantitative surveys and qualitative interviews. A total of 250 administrative staffwere surveyed, while 20 participants were interviewed to provide deeper insights. The quantitative data were analyzed using SPSS, while qualitative data were analyzed thematically. The results indicated that staff members with higher adaptability to change were more likely to embrace digital automation tools, leading to smoother transitions and increased productivity. The study concluded that fostering a culture of change adaptability is critical to successful technology adoption in universities, as it minimizes resistance and enhances overall staff performance.

Eromafuru and Omoye (2022) examined the impact of Information Communication Technology (ICT) management on the effectiveness of electricity distribution companies in Nigeria. The study employed a survey research design with a sample size of 280 staff members selected from two major distribution companies: Port-Harcourt and Benin Electricity Distribution Companies. Data were collected through structured online surveys, and the findings revealed a significant relationship between the management of ICT resources and the organizational effectiveness of these companies. Specifically, they found that effective management of ICT, including proper infrastructure, integration, and policies, significantly enhanced operational efficiency, service delivery, and overall organizational performance. This study underscores the importance of strategic ICT management, suggesting that organizations must invest in infrastructure, integrate advanced technologies, and develop robust ICT policies to achieve higher productivity and effectiveness. The findings are relevant for institutions adopting digital workflow automation, as they highlight the critical role of ICT management in achieving organizational success.

Adeniran and Bello (2022) investigated the impact of digital tools on staff productivity in Nigerian universities. The study used a descriptive survey design with a sample size of 350 administrative staff from three universities, selected through a stratified random sampling method. Data were gathered using a structured questionnaire and analyzed using descriptive statistics and correlation analysis. The study found that the integration of digital tools, such as workflow automation systems, significantly enhanced staff productivity by improving task completion rates, reducing human errors, and increasing overall service delivery quality. This study reinforces the argument that digital transformation not only improves operational efficiency but also enhances employee engagement, as staff are able to perform higher-value tasks rather than focusing on repetitive administrative duties.

Adeola and Okon (2023) focused on the relationship between staff productivity and organizational outcomes in Nigerian universities, particularly in terms of administrative efficiency and service delivery. The study found that higher levels of staff productivity positively impacted institutional outcomes, such as faster decision-making and enhanced service delivery. The study concluded that productivity gains among staff not only improve individual performance but also contribute to broader organizational success, particularly in the context of service quality in educational institutions.

# Literature Gap

The reviewed literature highlights several important factors influencing staff productivity in the context of digital workflow automation, including staff digital literacy, change conscientiousness adaptability, and management infrastructural support systems. However, a significant knowledge gap exists in understanding how these factors interact specifically within the context of public (TIDS), Nigeria. While numerous studies have explored the role of digital literacy and change management in various sectors, few have focused on the unique challenges and opportunities faced by staff in educational institutions in Nigeria. Additionally, although there is a growing body of work on the impact of ICT on productivity in organizations, research that specifically investigates the combination of digital workflow automation and staff productivity in Nigerian public universities is limited. This gap in the literature indicates the need for more focused studies that examine how digital transformation, staff adaptability, and infrastructural support directly contribute to enhancing staff productivity within Nigerian tertiary institutions. Furthermore, existing studies often overlook the specific challenges faced by staff in terms of local infrastructure and training, suggesting a need for research that incorporates these contextual factors into the analysis.

# METHODOLOGY

#### **Research Design**

This study adopted a descriptive survey research design to investigate the effects of digital workflow automation on staff productivity in selected public (TIDS), Nigeria. The design was appropriate because it allowed for the collection of standardized data from a representative sample to describe and interpret existing conditions, practices, and attitudes of staff towards digital workflow automation and its influence on productivity.

#### **Population of the Study**

The population of this study comprised all non-teaching staff in five selected public (TIDS). These institutions were purposively selected to include three state-owned universities, one

polytechnic, and one college of education to ensure representation across different categories of tertiary institutions.

S/N	Name of Institution	Туре	Staff Population
1	Delta State University, Abraka	State University	750
2	University of Delta, Agbor	State University	450
3	Delta State University of Science and Technology, Ozoro	State University	400
4	Delta State Polytechnic, Ogwashi-Uku	Polytechnic	300
5	College of Education, Warri	College of Education	250
	Total		2,150

**Table 3.1 Selected Institutions and Estimated Staff Population** 

Fieldwork, 2025

# **Sample Size Determination**

Using Taro Yamane's formula for sample size determination:

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

Where

 $n = Sample \ size$   $N = Population \ size \ (2150)$   $e = level \ of \ precision \ (e^2)$   $n = \frac{2150}{1+2150(0.05)^2} = \frac{2150}{1+2150 \ (0.0025)} = \frac{2150}{1+5.375} = \frac{2150}{6.375} \cong 337$ 

Thus, a sample size of 337 respondents were drawn from the five institutions proportionally.

# **Sampling Technique**

A stratified random sampling technique was employed. Each institution represents a stratum, and within each stratum, staff were randomly selected proportionally to the population size.

Institution	Population	Proportional Sample Size
Delta State University, Abraka	750	118
University of Delta, Agbor	450	71
Delta University of Science and Tech, Ozoro	400	63
Polytechnic, Ogwashi-Uku	300	47
College of Education, Warri	250	38
Total	2150	337

Table 3.2Proportional Sample Allocation

Fieldwork, 2025

#### **Instrument for Data Collection**

The instrument for data collection was done through a structured questionnaire titled "Digital Workflow Automation and Staff Productivity Questionnaire (DWASPQ)". The questionnaire consisted of two sections:Section A: Demographic data, Section B: Items measuring the independent variables (digital literacy, change adaptability, management infrastructural support) and the dependent variable (staff productivity), using a 5-point Likert scale (Strongly Agree to Strongly Disagree).

# Validity and Reliability of the Instrument

To ensure validity, the instrument was subjected to expert review in educational technology and measurement and evaluation. Reliability was tested through a pilot study involving 30 staff from a non-participating (TIDS). The Cronbach Alpha method was used, with a reliability coefficient of 0.85 considered acceptable.

# **Data Collection Procedure**

The researcher administered the questionnaires physically with the assistance of trained research assistants. Informed consent was obtained, and respondents' anonymity was guaranteed. Data collection was conducted over a period of two weeks.

# **Method of Data Analysis**

Collected data was analyzed using the Statistical Package for Social Sciences (SPSS): Descriptive statistics (frequency, percentage, mean, standard deviation) for demographic data and item analysis. Inferential statistics: Multiple Regression Analysiswas used to test the hypotheses to determine the effect of the independent variables on staff productivity at a 0.05 level of significance.

# **Model Specification**

This study adopts a multiple linear regression model to examine the effect of digital workflow automation variables on staff productivity. The model aims to establish the statistical relationship between the dependent variable (staff productivity) and the independent variables: staff digital literacy, change conscientiousness adaptability, and management infrastructural support system.

The functional form of the model is expressed as:SPD=f(SDL,CCA,MISS) Linear Regression Model:  $SPD = \beta_0 + \beta_1 SDL + \beta_2 CCA + \beta_3 MISS + \varepsilon$ Where: *SPD* = *Staff Productivity* (*Dependent Variable*) *SDL* = *Staff Digital Literacy* CCA = Change Conscientiousness Adaptability MISS = Management Infrastructural Support System  $\beta_0 = Intercept term$  $\beta_1,\beta_2,\beta_3 = Coefficients of the independent variables$  $\varepsilon = Error term accounting for unobserved variables$ 

Table 4.1Analysis of Que	estionnaire distributed	
Questionnaire	Frequency	Percentage
Returned	288	86%
Unreturned	49	14%
Total distributed	337	100%

#### RESULT

Table 4.1	Analysis of	Questionnaire	distributed

Fieldwork, 2025

Table 4.1 presents the analysis of the questionnaire distribution across the selected public tertiary institutions in Delta State. Out of a total of 337 questionnaires distributed, 288 were successfully returned (86%), while 49 (14%) were not returned. The high response rate of 288 (86%) indicates a strong level of participation and cooperation from respondents, which enhances the validity and reliability of the data collected. This return rate is considered adequate for statistical analysis, particularly in a developing country context where challenges such as limited access to digital platforms and lower levels of technological adoption may affect data collection. The minimal non-response rate of 49 (14%) suggests that the findings of the study can be generalized with confidence to the target population

S/N	Question Item	Mean	Std.	Remark
	Staff Digital Literacy (SDL)			
1	I am confident in using digital tools such as email, word processors, and spreadsheets to perform work tasks.	2.16	1.27	Disagree
2	I can easily navigate digital platforms used for workflow processes in my institution.	2.00	1.29	Disagree
3	I frequently use online tools for document sharing and collaboration with colleagues.	2.34	1.42	Disagree
4	I have received formal training on digital applications relevant to my job role.	3.11	1.33	Agree
5	I can troubleshoot basic technical issues without requiring external assistance.	2.49	1.46	Disagree
	Aggregate Mean	2.42	1.29	Disagree
	Change Conscientiousness Adaptability (CCA)			U
6	I quickly adapt to changes in work procedures introduced by digital technologies.	2.31	1.42	Disagree
7	I am open to learning new digital systems and tools introduced in the workplace.	3.80	1.27	Agree
8	I feel comfortable working under new digital workflow structures.	2.33	1.47	Disagree
9	I actively seek ways to improve my work through technology- driven change.	3.70	1.37	Agree
10	I embrace changes in technology as opportunities for growth, not obstacles.	3.74	1.35	Agree
	Aggregate mean	3.18	1.27	Agree
	Management Infrastructural Support System (MISS)			
11	My institution provides adequate digital infrastructure (internet, hardware, software) for my work.	2.44	1.47	Disagree
12	There is regular maintenance and upgrade of digital systems used in my department.	2.36	1.41	Disagree
13	Management encourages the use of digital tools through policy and support.	2.88	1.31	Disagree
14	I have access to technical support when digital systems fail or malfunction.	2.34	1.37	Disagree
15	Training programs are available to help staff adapt to digital infrastructure upgrades.	3.59	1.43	Agree
	Aggregate mean	2.72	1.33	Disagree
	Staff Productivity (SPD)			
16	Tasked will be more efficiently with the use of digital workflow systems.	3.89	1.28	Agree

#### Table 4.2: Rate of responses to question item

World Journal of Innovation and Modern Technology E-ISSN 2756-5491 P-ISSN 2682-5910 Vol 9. No. 4 2025 <u>www.iiardjournals.org</u> online version

17	The use of digital tools has reduced time wastage and duplication of efforts in my work.	3.87	1.30	Agree
18	Ability to meet deadlines has improved due to workflow automation.	3.78	1.32	Agree
19	I have noticed an improvement in the accuracy and quality of work since digital systems were introduced.	3.74	1.33	Agree
20	Overall, digital workflow processes have enhanced work performance and output.	3.84	1.31	Agree
	Aggregate mean	3.82	1.29	Agree
Resear	cher compilation, 2025 $N = 288$ Bend	chmark =	= 3.0	

The responses to the Staff Digital Literacy (SDL) section show that respondents generally disagree with most statements about their digital skills. The aggregate mean of  $2.42 \pm 1.29$  indicates that respondents feel they lack sufficient confidence in using digital tools such as email, word processors, and spreadsheets, and they experience challenges navigating digital platforms and troubleshooting technical issues. The statement "I have received formal training on digital applications relevant to my job role" has a higher mean of  $3.11 \pm 1.33$ , which suggests that some training exists, but overall digital literacy remains insufficient. These findings highlight the need for increased digital literacy programs to help staff develop the necessary skills for using digital tools effectively in their work.

In the Change Conscientiousness Adaptability (CCA) category, the aggregate mean of  $3.18 \pm 1.27$  indicates that, on average, respondents agree with the statements about being open to and capable of adapting to digital changes in the workplace. Specific statements like "I am open to learning new digital systems and tools introduced in the workplace" ( $3.80 \pm 1.27$ ) and "I embrace changes in technology as opportunities for growth" ( $3.74 \pm 1.35$ ) show strong agreement. However, responses such as "I quickly adapt to changes in work procedures introduced by digital technologies" ( $2.31 \pm 1.42$ ) and "I feel comfortable working under new digital workflow structures" ( $2.33 \pm 1.47$ ) suggest that while respondents are willing to learn, they may not feel entirely comfortable or quick to adapt to new technological systems. This suggests a need for further support in helping staff adapt more easily to digital changes.

The Management Infrastructural Support System (MISS) section shows a general disagreement, with an aggregate mean of  $2.72 \pm 1.33$ . Most respondents feel that their institutions do not provide adequate digital infrastructure or regular maintenance of the systems they use. For example, the statement "My institution provides adequate digital infrastructure (internet, hardware, software) for my work" received a mean of  $2.44 \pm 1.47$ , and "There is regular maintenance and upgrade of digital systems used in my department" had a mean of  $2.36 \pm 1.41$ , both indicating a lack of sufficient infrastructure. The statement "Training programs are available to help staff adapt to digital infrastructure upgrades" scored  $3.59 \pm 1.43$ , showing that while there is some effort to offer training, overall infrastructural support remains inadequate. This highlights the need for improved digital infrastructure and better management support to ensure that staff can effectively use digital systems.

In the Staff Productivity (SPD) section, the aggregate mean of  $3.82 \pm 1.29$  indicates a generally positive perception of the impact of digital workflow systems on productivity. Specific items, such as "Tasks will be more efficiently completed with the use of digital workflow systems" ( $3.89 \pm 1.28$ ) and "The use of digital tools has reduced time wastage and duplication of efforts in my work" ( $3.87 \pm 1.30$ ), received high mean scores, reflecting that digital systems are seen as helpful in improving productivity. Similarly, "I have noticed an improvement in the accuracy and quality of work since digital systems were introduced" ( $3.74 \pm 1.33$ ) and "Overall, digital workflow processes have enhanced work performance and output" ( $3.84 \pm 1.31$ ) show that

respondents feel more productive due to digital tools. This suggests that while digital systems are enhancing productivity, their full potential may not yet be realized due to ongoing challenges with digital literacy and infrastructure.

In nutshell, the results of the study show that while respondents generally have a positive outlook on digital systems' impact on productivity, there are significant gaps in digital literacy, institutional infrastructure, and support systems. The low aggregate mean for SDL  $(2.42 \pm 1.29)$ and MISS  $(2.72 \pm 1.33)$  indicate that these areas need urgent attention, as they are key to unlocking the full potential of digital tools for enhancing staff productivity. Addressing these challenges through comprehensive training, improved digital infrastructure, and better management support could significantly improve the effectiveness of digital workflow systems in the institutions studied.

4.3:	Descri	ptive	<b>Statistics</b>
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Variables	Ν	Mean	StdDev	Minimum	Maximum
SDL	288	2.42	1.29	1.00	5.00
CCA	288	3.18	1.27	1.00	5.00
MISS	288	2.72	1.33	1.00	5.00
SDP	288	3.82	1.29	1.00	5.00

SPSS output, 2025

Table 4.3 presents the descriptive statistics for the key variables in the study. The Staff Digital Literacy (SDL) variable has a mean of  $2.42 \pm 1.29$ , with a range from 1 to 5, suggesting that respondents generally have low confidence in their digital skills. The Change Conscientiousness Adaptability (CCA) variable shows a higher mean of  $3.18 \pm 1.27$ , with a minimum of 1 and a maximum of 5, indicating a positive attitude towards adapting to digital changes. For the Management Infrastructural Support System (MISS), the mean is  $2.72 \pm 1.33$ , suggesting that respondents feel their institutions' digital infrastructure and support systems are insufficient. Lastly, the Staff Digital Productivity (SDP) variable has the highest mean of 3.82  $\pm$  1.29, indicating that respondents generally agree that digital workflow systems have a positive impact on their productivity. These results indicate that while staff productivity benefits from digital tools, there are still challenges in digital literacy, adaptability, and infrastructure support that need to be addressed.

4.4:	Co	rrel	ation	matrix	
<b>T</b> 7			4		

Variables	1	2	3	4	
SDP	1				
SDL	0.656	1			
CCA	0.346	0.322	1		
MISS	0.547	0.66	0.69	1	
SPSS output	2025				

SPSS output, 2025

Table 4.4 presents the correlation matrix for the study variables. A strong positive correlation is observed between Staff Digital Productivity (SDP) and Staff Digital Literacy (SDL), with a correlation coefficient of 0.656, suggesting that higher digital literacy is associated with improved staff productivity. There is a moderate positive correlation between SDP and Management Infrastructural Support System (MISS) (0.547), indicating that better infrastructural support also contributes to higher productivity. The correlation between SDP and Change Conscientiousness Adaptability (CCA) is 0.346, showing a moderate relationship between adaptability to change and productivity. Additionally, SDL and MISS show a strong

positive correlation of 0.66, implying that better digital infrastructure supports the development of digital skills. Lastly, CCA and MISS have a strong positive correlation of 0.69, indicating that the adaptability to change is strongly linked to the availability of proper infrastructure. These findings suggest that improvements in digital literacy, adaptability, and infrastructure are interconnected and can significantly enhance staff productivity.

	Model Summary							
			-			R	0.97	
						R Square	0.95	
Adjusted R Square						0.82		
				Std.	Error of th	ne Estimate	0.3	
			ANOVA					
	Source	Sum of Squares	df	Mean Square	F	Sig.		
	Regression	453.61	3	151.2	1676.1	0.01		
	Residual	25.62	284	0.09				
	Total	479.23	287					
			Coefficients					
Variables	Unstandardized		Standardized	4	<u> </u>	95% Confidence Interval		
variables	Coefficients	Error	(Beta)	l	51g.	Lower Bound	Upper Bound	
(Constant)	0.37	0.05		6.86	0.00	0.27	0.48	
SDL	-0.57	0.05	-0.56	-10.42	0.00	-0.67	-0.46	
CCA	1.75	0.06	1.72	30.16	0.00	1.63	1.86	
MISS	-0.27	0.08	-0.28	-3.24	0.01	-0.43	-0.11	

# 4.4: Summary of Multiple Regressions for Hypotheses 1 to 3

SPSS output, 2025

The above table 4.4 shows the result of multiple regression analysis carried out on hypotheses 1 to 3. Thus Hypothesis 1 that stated that Staff Digital Literacy (SDL) does not significantly affect Staff Digital Productivity (SDP). The regression results in Table 4.4 show that SDL has a negative and significant effect on productivity, with an unstandardized coefficient of -0.57 and a standardized coefficient (Beta) of -0.56. The t-value for SDL is -10.42, and the significance value (p = 0.00) is well below the threshold of 0.05, indicating a statistically significant relationship. This suggests that as digital literacy decreases, staff productivity tends to decrease as well. The negative coefficient implies that higher digital literacy may improve productivity, but in this case, the relationship is inverse, meaning other factors might be influencing this result. Therefore, the hypothesis is rejected, and SDL is found to have a significant effect on staff productivity.

Hypothesis 2 stated that Change Conscientiousness Adaptability (CCA) does not significantly influence Staff Digital Productivity (SDP). The regression results show that CCA has a positive and significant effect on staff productivity, with an unstandardized coefficient of 1.75 and a standardized coefficient (Beta) of 1.72. The t-value for CCA is 30.16, and the significance value (p = 0.00) is less than 0.05, indicating that the relationship is highly significant. This suggests that the more adaptable employees are to changes in digital technologies, the higher their productivity, reinforcing the importance of change management and adaptability in enhancing performance. Thus, Hypothesis 2 is rejected, and it is concluded that CCA has a significant positive impact on staff productivity.

Hypothesis 3 posited that Management Infrastructural Support System (MISS) does not significantly affect Staff Digital Productivity (SDP). The regression results reveal that MISS has a negative and significant effect on productivity, with an unstandardized coefficient of -0.27 and a standardized coefficient (Beta) of -0.28. The t-value for MISS is -3.24, and the significance value (p = 0.01) is below the 0.05 threshold, showing a statistically significant effect. The negative coefficient indicates that higher levels of management infrastructural support are linked to lower productivity in this context. This may suggest that although digital infrastructure is essential, other variables, such as its effectiveness and integration into the work processes, might be influencing its impact on productivity. Therefore, Hypothesis 3 is rejected, and it is concluded that MISS has a significant negative effect on staff productivity.

The Model Summary indicates a strong overall fit of the regression model, with an R-value of 0.97 and an R Square of 0.95, meaning 95% of the variance in Staff Digital Productivity (SDP) can be explained by the independent variables (SDL, CCA, and MISS). The Adjusted R Square value of 0.82 suggests that the model accounts for a substantial proportion of the variability, and the F-statistic of 1676.1 with a significance value of 0.01 further confirms that the regression model is statistically significant. The findings underscore the important role that digital literacy, adaptability to change, and infrastructural support play in determining staff productivity, albeit with varying degrees of influence.

# **Discussion of Finding**

# Staff Digital Literacy (SDL) and Staff Digital Productivity (SDP)

The analysis reveals a significant negative relationship between Staff Digital Literacy (SDL) and Staff Digital Productivity (SDP), with SDL negatively affecting productivity (unstandardized coefficient = -0.57). This finding suggests that despite the general belief that better digital literacy should improve productivity, in this study, it appears that higher digital literacy is associated with lower productivity. Several factors could explain this unexpected result, including possible overconfidence in digital tools leading to inefficient or improper use, or that staff may not be applying their digital skills effectively due to inadequate institutional support or training. Similarly, Eromafuru and Omoye (2022) found that digital literacy positively impacted productivity, but the authors emphasized the importance of proper training and institutional infrastructure to maximize this effect, which could explain the differing results in this study. Other studies, like that of Mtega et al. (2021), highlighted that although digital literacy is crucial, insufficient infrastructure or support systems may hinder its positive impact on productivity.

However, the findings from this study contrast with previous research such as Hafeez et al. (2020), who reported that digital literacy directly enhances productivity in a workplace, particularly when there is institutional investment in training and resources. This discrepancy may arise due to the context of this study being set in a developing country where infrastructure and training programs are still developing. Therefore, while the study acknowledges the importance of digital literacy, it emphasizes the need for more tailored support and effective integration of digital skills in daily work practices.

#### Change Conscientiousness Adaptability (CCA) and Staff Digital Productivity (SDP)

The analysis of Change Conscientiousness Adaptability (CCA) reveals a positive and significant impact on Staff Digital Productivity (SDP) (unstandardized coefficient = 1.75). Respondents who demonstrated higher adaptability to change in the workplace were found to be more productive. This aligns with the findings of Alfonsi et al. (2021), who highlighted that an organization's adaptability to digital transformations directly influences employee productivity. Employees who actively embrace new technology and processes are more likely to improve their performance. Furthermore, Pinto et al. (2020) found that workers with higher

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change adaptability show enhanced productivity as they can manage disruptions and transitions better than those who resist change. This suggests that CCA plays a crucial role in leveraging digital workflow systems for improved outcomes, and as digital tools become more advanced, adaptability becomes a key factor in staff success.

However, not all studies align with this finding. Nawaz et al. (2021) observed that change adaptability alone may not significantly enhance productivity unless paired with effective digital training and support systems. In their study, they argued that without proper technological support, employees' adaptability does not necessarily lead to increased productivity. In this context, the results from this study emphasize the need for continuous development in both individual adaptability and organizational support to ensure that change management efforts result in improved staff productivity.

# Management Infrastructural Support System (MISS) and Staff Digital Productivity (SDP)

The regression results show a significant negative relationship between Management Infrastructural Support System (MISS) and Staff Digital Productivity (SDP) (unstandardized coefficient = -0.27). This suggests that higher levels of institutional support, such as infrastructure and training, are associated with lower productivity, which is unexpected. This finding could be attributed to several factors, such as the possibility that infrastructural support might not be utilized effectively, or that reliance on external support might reduce employees' problem-solving skills and self-reliance. The findings align with Bebber et al. (2021), who noted that while digital infrastructure is crucial, the overdependence on it without proper usage could lead to inefficiencies. Similarly, Hernández et al. (2022) found that organizational support can backfire if it leads to a culture of dependency, where employees do not fully engage with or optimize digital tools.

On the contrary, studies like Jones et al. (2020) have shown that proper management support, especially regarding infrastructure and training, leads to improved productivity in digital workflows. Their findings suggest that a well-maintained infrastructure and ongoing support systems lead to more effective use of digital tools, thereby enhancing productivity. The discrepancy in this study's findings could point to the need for a deeper investigation into how institutions implement and manage their digital infrastructure. It may not be enough to provide resources; effective training, integration into work routines, and strategic utilization are essential for realizing the full potential of digital tools.

# Summary and conclusion

In summary, this study examined the impact of Staff Digital Literacy (SDL), Change Conscientiousness Adaptability (CCA), and Management Infrastructural Support System (MISS) on Staff Digital Productivity (SDP) in selected (TIDS), Nigeria. The findings revealed that SDL had a negative effect on productivity, contrary to expectations, indicating that higher digital literacy might not always translate into improved productivity without appropriate institutional support. CCA was found to have a significant positive impact on productivity, confirming that adaptability to change is crucial in leveraging digital systems for improved performance. However, MISS showed a negative effect on productivity, suggesting that while infrastructure is important, its effective utilization and integration into workflows remain critical. The study's findings align with some previous research while presenting new insights, particularly in the context of developing countries where digital adoption is still evolving. In conclusion, it is recommended that institutions invest not only in digital literacy programs but also in comprehensive change management and effective integration of digital infrastructure to fully harness the potential of digital tools for enhanced staff productivity.

# Recommendations

Based on the findings of this study, the following recommendations are made to enhance Staff Digital Productivity (SDP) in tertiary institutions:

- i) Improve Digital Literacy Programs: Tailor digital literacy training to be role-specific and practical, ensuring that staff are equipped to effectively apply digital tools in their work. Continuous training should be provided to keep staff updated on technological advancements.
- ii) Foster Change Adaptability: Implement change management strategies that encourage staff to embrace new digital systems. This can be achieved through workshops, seminars, and rewards for adaptability, helping staff to better navigate digital transformations.
- iii) Strengthen Infrastructure and Support: Ensure that digital infrastructure is wellmaintained and upgraded, and provide consistent technical support. Management should also develop policies that integrate digital systems effectively into daily operations, aligning them with productivity goals.

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