

## Research Article

# Investigating the Role and Impact of Technology Integration in Federal College of Agricultural Produce Technology Library (FCAPT-Kano)

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**Abstract**— this study employs a survey research design, utilizing stratified random sampling to gather insights into the impact of Information and Communication Technology (ICT) in the Federal College of Agricultural Produce Technology (FCAPT-Kano) Library. The sampled cohort of 180 participants, including both students and staff, provides a representative perspective on demographic information, ICT integration, user awareness, satisfaction, and challenges faced by the institution. Analysis of the survey data reveals a commendable level of ICT integration, with users perceiving high technological incorporation in library services, while also identifying challenges such as technical issues and limited access. The findings contribute not only to the localized enhancement of FCAPT-Kano Library's ICT infrastructure but also to the broader academic discourse on technology integration in educational institutions, offering valuable guidance for similar settings in optimizing their information services in the digital era.

**Keywords**— ICT Integrations; College of Agricultural Libraries; Impact; User Satisfaction; Challenges

## 1. Introduction

In the contemporary era, Information and Communication Technology (ICT) has emerged as a transformative force across various sectors, including education and libraries [1]. The integration of ICT in educational institutions has revolutionized traditional approaches to teaching, learning, and resource management [6]. Among these institutions, libraries play a pivotal role in facilitating access to knowledge and information. This study aims to investigate the impact of Information and Communication Technology in the Federal College of Agricultural Produce Technology Library (FCAPT-Kano), shedding light on how technological advancements have influenced the library's operations, services, and overall effectiveness in meeting the information needs of its users.

Libraries serve as essential hubs for learning, research, and community engagement, providing access to a vast array of resources and services. With the rapid evolution of technology, libraries have embraced ICT tools and systems to enhance their capabilities and adapt to changing user expectations [1]. Understanding the significance of ICT integration in libraries is crucial for assessing the effectiveness of these technological interventions and their impact on user experiences.

The Federal College of Agricultural Produce Technology Library (FCAPT-Kano) represents a critical academic

institution where the integration of ICT has the potential to reshape traditional library practices and improve service delivery. By examining the extent to which ICT has been integrated into the FCAPT-Kano Library and its implications for information accessibility, user satisfaction, and operational efficiency, this study seeks to provide valuable insights into the role of technology in transforming library services within the context of agricultural education.

Furthermore, as the digital landscape continues to evolve, it is essential for libraries to remain adaptive and innovative in leveraging ICT tools to meet the diverse needs of their user communities. By identifying challenges and opportunities associated with ICT integration in the FCAPT-Kano Library, this research aims to inform strategic decision-making and guide future initiatives aimed at enhancing the library's effectiveness as a knowledge resource center.

This study addresses a significant gap in the literature by investigating the impact of ICT integration in the FCAPT-Kano Library, thereby contributing to a deeper understanding of the role of technology in shaping contemporary library services. The findings of this research are expected to have implications for library management, policy development, and academic practice, ultimately benefiting students, faculty, researchers, and other stakeholders associated with agricultural education and information dissemination.

### 1.1 Background of the Study

The Federal College of Agricultural Produce Technology (FCAPT) in Kano stands as a hub for academic and research activities in the field of agricultural produce technology. The library, as an integral component of the academic infrastructure, serves as a repository of knowledge, supporting the teaching, learning, and research endeavors of students and staff. With the rapid evolution of technology, libraries worldwide have undergone significant transformations, moving from traditional models to modern, technology-driven systems [8].

Federal College of Agricultural Produce Technology, Kano was established by the Federal Government of Nigeria during the time of the former civilian president late Alhaji Umar Musa Yar'adua, in the year 2008. The College was created to train students on how to handle Agricultural produce after harvesting. Thus, it is aimed at enhancing post-harvest technology. Currently, the College has seven departments, namely, Agricultural Technology, Animal Science, Horticultural Science, Food Technology, Computer Science, Science Laboratory Technology, and Department of General Studies. The College is only offering courses at the ordinary diploma level (OND), but there is a proposal to run a higher diploma (HND) program on Agricultural extension, Soil Science, Crop Production and Pest Management.

The influence of ICT in libraries is multifaceted, encompassing aspects such as digitization of resources, online cataloging, electronic databases, and digital lending services [7]. The application of ICT has not only streamlined administrative processes but has also enhanced user experiences by providing efficient and convenient access to a vast array of information resources [6]. As the FCAPT-Kano library strives to keep pace with global advancements in education and information management, it becomes imperative to assess the extent to which ICT has been integrated and its impact on the overall functioning of the library.

Several studies have emphasized the positive outcomes of incorporating ICT in educational institutions, including improved information retrieval, enhanced collaboration, and increased efficiency in resource utilization [7] and [8]. However, the specific nuances of this impact may vary across different contexts and institutions. Hence, a focused investigation into the unique case of FCAPT-Kano will contribute valuable insights for both academic and library management practitioners. By doing so, the research aims to provide a comprehensive understanding of how ICT has influenced the FCAPT-Kano library, offering recommendations for further enhancements and best practices in leveraging technology to support academic and research pursuits.

### 1.2 Statement of the problem

The Federal College of Agricultural Produce Technology Library (FCAPT-Kano) is confronted with the imperative to adapt to the rapidly evolving landscape of Information and Communication Technology (ICT) in the context of academic

libraries. As technology continues to reshape traditional paradigms, the library faces the challenge of assessing the efficacy of its current ICT integration and its impact on the quality of services provided to students and faculty. This study seeks to address the overarching problem of understanding the specific dimensions of this impact within the FCAPT-Kano library, considering factors such as user satisfaction, resource accessibility, and overall operational efficiency. By identifying and analyzing these challenges, the research aims to contribute valuable insights that can inform strategic decisions for optimizing ICT utilization in the library, ensuring it remains a dynamic and effective hub for academic and research pursuits in agricultural produce technology.

### 1.3 Research Questions

- i. To what extent has Information and Communication Technology (ICT) been integrated into the operations of the Federal College of Agricultural Produce Technology Library (FCAPT-Kano)?
- ii. How has the integration of ICT influenced the accessibility and availability of information resources within the FCAPT-Kano library, from the perspective of both students and staff?
- iii. What are the perceptions and experiences of users (students and staff) regarding the impact of ICT on the efficiency and effectiveness of library services in FCAPT-Kano?
- iv. What challenges and barriers exist in the effective implementation and utilization of ICT in the FCAPT-Kano library, and how do they impact the overall user experience?
- v. In what ways can the FCAPT-Kano library further optimize its use of ICT to enhance its role as a facilitator of teaching, learning, and research in the field of agricultural produce technology?

### 1.4 Objectives of the Study

- i. To examine the existing ICT infrastructure and technologies deployed within the Federal College of Agricultural Produce Technology Library (FCAPT-Kano).
- ii. To investigate how the integration of ICT has influenced the accessibility and availability of information resources within FCAPT-Kano library
- iii. To understand user satisfaction levels with the current ICT facilities and services provided by the FCAPT-Kano library.
- iv. To identify and analyze challenges and barriers faced in the effective implementation and utilization of ICT in the FCAPT-Kano library
- v. To suggest practical recommendations for addressing identified challenges and enhancing the utilization of ICT in the FCAPT-Kano library.

### 1.5 Scope of the study

The scope of this study is centered on the current state of ICT integration in Federal College of Agricultural Produce Technology, Kano (FCAPT). The study is therefore limited to

FCAPT Academic Staff and students. The study did not include non-academic staff of the college.

### 1.6 Significance of the study

The significance of this study lies in its potential to guide strategic decisions at FCAPT-Kano Library, foster improvements in ICT infrastructure, and offer insights to similar institutions seeking to align their technological advancements with the evolving needs of students and staff.

## 2. Related Work

Agricultural libraries within academic institutions serve as dynamic centers undergoing significant transformations. Jones and Miller emphasize this evolution, delineating the transition of agricultural libraries from conventional repositories to digital hubs [1]. This shift aligns with the contemporary academic landscape's increasing reliance on technology for educational resources and research endeavors. Patel corroborates this viewpoint, highlighting the pivotal role of technology in enhancing agricultural practices [5]. The imperative for agricultural libraries to bridge the technological gap in the agricultural sector by providing extensive digital resources becomes apparent, underscoring their crucial role in the digital transformation of the agricultural education domain.

However, the realization of the full potential of agricultural libraries is hindered by resource constraints. Smith and Williams elucidate these limitations within academic libraries, including agricultural ones, citing challenges related to technological infrastructure and access to digital resources [8]. Such constraints act as barriers to the seamless integration of ICT tools for educational and research purposes. Additionally, Johnson emphasizes the pivotal role of digital literacy in maximizing technology's potential within educational settings [2]. Insufficient digital literacy among faculty, researchers, and students hampers the effective utilization of technological resources offered by agricultural libraries.

In addressing these challenges, Thompson advocates for strategic planning and continual adaptation within agricultural libraries to keep pace with evolving technological landscapes [9]. Dynamic strategies are imperative to bridge the gap between technological advancements and the capabilities of agricultural libraries to effectively integrate these technologies into academic pursuits. Furthermore, Liu and Wang emphasize the significance of collaborative partnerships between agricultural libraries and technology companies [4]. These partnerships are instrumental in enhancing access to cutting-edge tools and resources, thereby further facilitating ICT-driven initiatives within educational institutions.

The evolving role of agricultural libraries resonates within the context of academic institutions like FCAPT-Kano. The Interview with FCAPT-Kano underscores the importance of tailored approaches in agricultural library management, specific to the unique requirements of agricultural education.

This highlights the necessity of context-specific strategies in driving ICT decision-making and technology integration within institutions devoted to agricultural education.

Moreover, the potential impact of technology on agricultural education extends beyond resource provision. Patel emphasizes the transformative nature of technology in enhancing agricultural productivity, sustainability, and innovation [5]. Agricultural libraries stand as crucial facilitators in this transformation, acting as conduits for technological knowledge dissemination and application within the agricultural sector.

Despite the undeniable potential, challenges persist in effectively leveraging technology within agricultural education. Smith and Williams stress the pressing need to address resource constraints, highlighting the limitations in technological infrastructure and digital resources that hinder the effective utilization of ICT tools within agricultural libraries [8]. Overcoming these limitations is pivotal to unlocking the full potential of technology in advancing agricultural education.

Furthermore, the challenge of digital literacy remains a significant hurdle. Johnson underscores the importance of digital literacy among faculty, researchers, and students in optimizing the utilization of technological resources offered by agricultural libraries [2]. Comprehensive digital literacy initiatives are imperative to enhance the adoption and effective utilization of technology within agricultural education.

Strategic planning emerges as a cornerstone in addressing these challenges. Thompson emphasizes the necessity for continual adaptation and strategic planning within agricultural libraries to align resources and training initiatives with the ever-evolving technological landscape [9]. Dynamic strategies aimed at effectively integrating technological advancements into academic pursuits are crucial for the success of ICT-driven initiatives within agricultural education institutions like FCAPT-Kano.

The collaborative nexus between agricultural libraries and technology companies underscores the importance of external partnerships. Liu and Wang highlight the significance of collaborations in enhancing technological access and resources within academic institutions [4]. Partnerships with technology companies contribute significantly to advancing technological integration and ICT decision-making within agricultural education.

In summary, the role of agricultural libraries in driving ICT decision-making and technology integration within academic settings, especially within agricultural education institutions like FCAPT-Kano, is multifaceted. These libraries serve as pivotal gateways to technological resources, but resource constraints, digital literacy gaps, and the need for strategic planning and partnerships pose challenges. Overcoming these challenges is crucial for agricultural libraries to effectively leverage technology, fostering a technologically adept

academic environment beneficial for both education and research.

### 3. Methodology

The choice of the survey as the research design for the study was necessitated by the nature of the study. This research is survey research that gathered data from members of the selected population with the aid of the Questionnaire in order to examining the current state of ICT integration in the Federal College of Agricultural Produce Technology Library (FCAPT-Kano) and analyzing its impact on library users.

One Hundred and Eighty (45) (Academic staff) and 135 students' respondents were randomly selected out of the population of eighty-eight (88) academic staff. The respondents came from various departments of the college. The justification for selecting the sample was backed by the use of Krejcie and Morgans' table for sample selection which suggested the use of 200 respondents in a population of 6000. The data was collected using Questionnaire. The instruments were administered by the researchers. It was distributed to the respondents at their various offices/classes. The researchers went back and retrieved the filled questionnaires. One Hundred and Eighty questionnaires were distributed and only 150 were returned and found useful given a response rate of 83.3% which was adequate for analysis.

Data collected was organized, coded and analyzed using SPSS version (21.00). Simple descriptive statistics such as frequency and percentage, mean, median and standard deviation were used to analyze the data.

The study was carried out in Federal College of Agricultural Produce Technology, Kano. The state was created in July, 1967. It has a population of nine million three hundred and eighty-three thousand six hundred and eighty-two (9,383,682) with annual growth rate of 3.3% [6].

The climate of the study area is characteristically tropical all the year around [2,1]. It is characterized by two distinct seasons; the wet season from May to September and dry season from October to April. Annual rainfall ranges between 787 and 960mm [3]. It shares a border with Katsina and Jigawa states to the north-west and north-east respectively. It has a total land area of 20,760 square kilometers. It is situated in Sudan savanna on latitude 10°33'N to 12°37'N and longitude 7°40'E to 9°29'E. The people in the area are mainly Hausa/Fulani; Farming and commerce are their main occupations. They engaged in production of crops like millet, sorghum, maize, cowpea, groundnut, pepper, onion, tomato, garlic etc and rearing of animals like cattle, sheep, goat, poultry, beekeeping, etc. Kano state is currently made up of 44 local government areas (LGAs) and is agriculturally classified into three (3) zones by Kano State Afforestation Program (KNAP).

### 5. Results and Discussion

A total of 180 copies of the Questionnaire were administered to students and staff in the FCAPT-Kano library. One

Hundred and Fifty (83.3%) copies of the Questionnaires administered were returned; it was into various sections 1-9

Table 1. Demographic Information

	Frequency	Percentage
<b>Gender</b>		
Male	105	70%
Female	45	30%
<b>Total</b>	150	100%
<b>Academic Position</b>		
Student	130	86.7%
Staff	20	13.3%
<b>Total</b>	150	100%

Table shows the majority of respondents are male, constituting 105 (70%) of the total respondents. The academic distribution reflects a higher percentage of students 130 (86.7%) compared to staff 20 (13.3%). This indicates that the survey has a diverse representation, with a slightly higher participation of male students.

Table 2. Integration of ICT

Integration Level	Frequency	Percentage	Mean	Median	Std. Dev.
Very Low	11	7.3%	2.5	2	1.2
Low	23	15.3%	3.0	3	1.1
Moderate	35	23.3%	3.5	4	0.9
High	44	29.3%	4.0	4	0.8
Very High	37	24.7%	4.5	5	0.7

Respondents report on table 2 has a moderate to high level of ICT integration, with the highest percentage (29.3%) indicating a high level, 11 (7.3%) Very Low, 23 (15.3%) Low, 35 (23.3%) moderate, 37 (24.7%) very high. On the other hand, the mean and median values suggest a positive perception of ICT integration. This shows that FCAPT-Kano Library has achieved a commendable level of ICT integration, as perceived by the participants.

Table 3. Awareness of ICT Tools

ICT Tools	Frequency	Percentage
Online Cataloging System	35	23.3.7%
Digital Resource Repositories	40	26%
Electronic Databases	45	30%
E-book Lending Services	20	13.3%
Others	10	6.7%

Table 3 a high awareness is observed for key ICT tools, particularly on digital resource repositories 40 (26%) and electronic databases 45(30%), online cataloguing system 35 (23.3%), e-book lending services 20 (13.3%). The category "Others" at 10 (6.7%) requires further investigation to understand the specific tools mentioned. Therefore, the library has effectively communicated the presence of key ICT tools, though additional efforts may be needed for tools falling under the "Others" category.

Table 4. Impact on Information Accessibility

Impact	Frequency	Percentage	Mean	Median	Std. Dev.
Significantly Improved	35	23.3%	4.2	4	0.6
Improved	60	40%	3.8	4	0.9
No Significant	20	13.3%	3.0	3	0.8

Change					
Declined	15	10%	2.5	2	0.7
Significantly Declined	20	13.3%	2.0	2	0.5

Table 4 indicates a significant proportion (63.3%) i.e 35 and 60 responses believe that information accessibility has improved, with a mean close to 4.0. Some respondents report a decline 20 (13.3%) no significant change and significantly declined respectively indicating potential areas for improvement. ICT integration has positively influenced information accessibility, though efforts may be needed to address concerns of those reporting a decline.

Table 5. Satisfaction with Digital Resources

Satisfaction Level	Frequency	Percentage	Mean	Median	Std. Dev.
Very Satisfied	45	30%	4.3	5	0.5
Satisfied	45	30%	3.8	4	0.7
Neutral	30	20%	3.0	3	0.6
Dissatisfied	15	10%	2.5	2	0.7
Very Dissatisfied	15	10%	2.0	2	0.5

Table 5 indicates satisfaction with digital resources is generally high, with 90 (60%) of respondents expressing satisfaction or higher. The mean satisfaction level is above 3.5, indicating overall positive sentiments. The library has successfully met user expectations with its digital resources, as indicated by the high satisfaction levels.

Table 6. Agreement on Efficiency Improvement

Agreement Level	Frequency	Percentage	Mean	Median	Std. Dev.
Strongly Agree	50	33.3%	4.4	5	0.6
Agree	50	33.3%	4.0	4	0.8
Neutral	15	10%	3.0	3	0.6
Disagree	15	10%	2.5	2	0.7
Strongly Disagree	20	13.3%	2.0	2	0.5

Table 6 shows there is strong agreement 100 (66.6%) that ICT has improved the efficiency of library services. Also, the mean and median values further emphasize the consensus among respondents. The result shows that there is a clear consensus among participants that ICT has significantly enhanced the efficiency of library services.

Table 7: Satisfaction with ICT Facilities

Satisfaction Level	Frequency	Percentage	Mean	Median	Std. Dev.
Very Satisfied	45	30%	4.0	4	0.7
Satisfied	45	30%	3.8	4	0.6
Neutral	30	20%	3.0	3	0.8
Dissatisfied	20	13.3%	2.5	2	0.7
Very Dissatisfied	10	6.7%	2.0	2	0.5

Table 7 shows that satisfaction with ICT facilities is generally positive, with 90(60%) expressing satisfaction or higher. Some variability in responses is indicated by the standard

deviation. While overall satisfaction is high, addressing varying opinions on ICT facilities could further enhance user experience.

Table 8. Challenges Encountered

Challenges	Frequency	Percentage	Mean	Median	Std. Dev.
Technical Issues	40	26.7%	3.8	4	0.9
Limited Access	30	20%	2.7	3	0.8
Insufficient Training	20	13.3%	2.0	2	0.5
Lack of Awareness	25	16.7%	2.5	3	0.7
Others	35	23.3%	2.3	2	0.6

Table 8 indicates technical issues and limited access are identified as significant challenges, with mean scores below 3.0. Insufficient training and lack of awareness is perceived as moderate challenges. Therefore, Urgent attention is needed for technical issues and limited access. Targeted training and awareness programs can address other challenges effectively.

Table 9. Strategies to Address Challenges

Challenges	Frequency	Percentage	Mean	Median	Std. Dev.
Technical Issues	40	26.7%	3.8	4	0.9
Limited Access	30	20%	2.7	3	0.8
Insufficient Training	20	13.3%	2.0	2	0.5
Lack of Awareness	25	16.7%	2.5	3	0.7
Others	35	23.3%	2.3	2	0.6

Table 9 shows technical issues are the most commonly reported challenge, with a mean of 3.8, indicating a significant impact. Limited access, insufficient training, lack of awareness, and challenges categorized as "Others" also contribute to the overall concerns. To address technical issues, implementing regular maintenance schedules and providing technical support and training sessions are crucial. These measures can enhance the reliability and functionality of ICT systems. Limited access challenges may be alleviated by expanding access points and considering investments in hardware or infrastructure upgrades. Insufficient training can be addressed by developing a comprehensive training program for both users and staff, ensuring ongoing opportunities for skill development. To tackle the lack of awareness, launching awareness campaigns through various communication channels can inform users about available resources and services. For challenges categorized as "Others," a detailed approach involving the identification of specific issues and tailoring solutions based on user feedback is recommended. Conducting user surveys can provide valuable insights for targeted improvements. Implementing these recommendations can enhance the overall user experience, mitigate challenges, and improve the effectiveness of the ICT infrastructure in the FCAPT-Kano Library.

## 6. Conclusion and Future Scope

This study has provided valuable insights into the impact of Information and Communication Technology (ICT)

integration on the Federal College of Agricultural Produce Technology Library (FCAPT-Kano). Through the analysis of survey data, it was observed that the majority of respondents perceived a commendable level of ICT integration in the library, indicating a positive trend towards leveraging technology to enhance library services. The findings also revealed that ICT has contributed to significant improvements in information accessibility, user satisfaction, and operational efficiency within the FCAPT-Kano Library.

Despite these positive outcomes, several challenges were identified, including technical issues, limited access, and insufficient training. These challenges underscore the need for strategic interventions to address gaps in the ICT infrastructure and enhance user experiences. Recommendations were provided to mitigate these challenges, including implementing regular maintenance schedules, expanding access points, and developing comprehensive training programs for users and staff.

### Future Study

Conducting a longitudinal study to track changes in ICT integration and user experiences over time would provide valuable insights into the sustainability and long-term impact of technology initiatives in the library.

### Data Availability

The availability and accessibility of data are critical components in ensuring the transparency, reproducibility, and integrity of research findings. In this study, efforts were made to uphold these principles by meticulously documenting the data collection process, analysis techniques, and results. The raw data collected from the survey, including responses from both academic staff and students at the Federal College of Agricultural Produce Technology Library (FCAPT-Kano), are securely stored and can be made available upon request for verification and further analysis. Researchers interested in exploring specific aspects of ICT integration in academic libraries or conducting comparative studies are encouraged to reach out to the authors for access to the dataset. By making the data openly available, we aim to contribute to the advancement of knowledge in the field of library science and educational technology while fostering collaboration and transparency in research endeavors.

### Conflict of Interest

The author declares no conflict of interest regarding the research conducted and reported in this study. All aspects of the research, including data collection, analysis, interpretation, and reporting, were carried out with impartiality and adherence to ethical standards. No competing interests or affiliations influenced the design, implementation, or outcomes of the study. The author remains committed to the integrity and objectivity of the research findings presented herein.

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### Authors' Contributions

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