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CONTEMPORARY ISSUES IN LIBRARIANSHIP

EDITED BY:
LUCKY TIJANI ABDULSALAMI PHD
ESIEVO, LOVET OVIGUE PHD.

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Dedication

To all librarians, whose tireless dedication shapes our understanding and access to knowledge, and to students, the future architects of information. Your pursuit of learning and commitment to inquiry illuminate the path forward in an ever-evolving world. This work is dedicated to you, as we navigate the contemporary issues in librarianship together. Your passion inspires change and innovation in the library community and beyond.

Preface

In an age marked by rapid technological advancements and shifting societal needs, the field of librarianship faces both unprecedented challenges and exciting opportunities. "Contemporary Issues in Librarianship" seeks to explore the multifaceted landscape of modern libraries, highlighting the critical roles they play in fostering access to information, promoting literacy, and supporting community engagement.

This collection addresses pressing topics such as digital literacy, information equity, privacy concerns, and the impact of social media on information dissemination. It also examines the evolving responsibilities of librarians as they adapt to new technologies and the changing expectations of their patrons.

As we embark on this exploration, it is essential to recognize that librarians are not just custodians of information; they are advocates for knowledge, champions of diversity, and facilitators of lifelong learning. Through our work, we help bridge gaps in access and empower individuals and communities to navigate the complexities of the information age.

We invite you to engage with these contemporary issues and reflect on the future of librarianship. Together, we can envision a library landscape that not only preserves the past but also embraces innovation and inclusivity.

LUCKY TIJANI ABDULSALAMI PhD.
Igbinedion University Okada, Edo State. Nigeria

Forward

In a world where information is both abundant and ephemeral, the role of libraries and librarians has never been more critical. "Contemporary Issues in Librarianship" serves as a vital examination of the challenges and opportunities that define the current landscape of library science.

As we navigate an era characterized by rapid technological change, evolving social dynamics, and a heightened awareness of the importance of information equity, this book provides valuable insights into the pressing concerns that librarians face today. From digital privacy and copyright issues to the importance of fostering community engagement, each chapter delves into the complexities of our profession and its impact on society.

The contributors to this work bring diverse perspectives and expertise, reflecting the rich tapestry of voices within the library community. Their collective wisdom not only highlights the challenges but also celebrates the innovative solutions and practices emerging in libraries around the globe.

As we look to the future, it is essential to recognize that librarians are more than just information gatekeepers; they are educators, advocates, and leaders in the quest for knowledge and equity. This book serves as both a call to action and a source of inspiration for those committed to advancing the mission of libraries in an ever-changing world.

I encourage you to delve into these pages with an open mind and a spirit of inquiry. Together, we can shape the future of librarianship and ensure that libraries remain vital hubs of learning and community connection.

Prof. Raphael Adeghe

Deputy Vice Chancellor
Igbinedion University Okada, Edo State
09-01-2025

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CONTEMPORARY ISSUES IN LIBRARIANSHIP

CHAPTER ONE

EVALUATION OF THE UTILIZATION OF ELECTRONIC SYSTEMS IN THE ADMINISTRATION OF PATIENT RECORDS AT ABUTH, ZARIA

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EVALUATION OF THE UTILIZATION OF ELECTRONIC SYSTEMS IN THE ADMINISTRATION OF PATIENT RECORDS AT ABUTH, ZARIA

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Abstract

This research investigated the utilization of electronic systems in the management of patient records at ABUTH, Zaria. To fulfill the study's objectives, the researchers formulated three key research questions: What is the extent of electronic system usage in managing patient records at ABUTH, Zaria? What advantages does the implementation of electronic systems offer in the management of patient records at ABUTH, Zaria? What obstacles hinder the effective application of electronic systems in managing patient records at ABUTH, Zaria? A survey research methodology was employed, utilizing questionnaires to gather pertinent data from a sample of 36 staff members across various records departments at ABUTH. The data collected were analyzed through descriptive statistics. The findings indicated the necessity for the provision of internet resources and computers, adequate funding for the acquisition and maintenance of ICT tools, training and retraining of health records personnel in practical computer skills, consistent power supply, and the promotion of effective organizational design and maintenance culture to ensure operational efficiency. Additionally, proper maintenance of the databank is essential to prevent system failures.

Key words: Electronic Health Information (EHI), Health Information Management (HIM), Electronic Medical Record (EMR), Electronic Prescribing (EP), Electronic Health Record (HER), Health Information System (HIS) National Health Service (NHS).

1.1 Introduction

The current advancement in the healthcare system, particularly in Nigeria, is the Electronic Health Information System (EHIS). This system encompasses all medical information pertaining to individual patients in a digital format. The EHIS facilitates the efficient storage and retrieval of personal health records through computer technology. Access to electronic health information is typically conducted via a computer, often utilizing a network connection. This information may be integrated from various locations and sources, and access may sometimes require a password. The concept of electronic health information, also known as electronic patient records or computerized records, is continually evolving. It is characterized as a longitudinal compilation of electronic health data concerning individual patients or populations. These records, which exist in a digital format, can be shared across different healthcare environments and are integrated into comprehensive, network-connected information systems. Such records may encompass a wide array of data, presented in either detailed or summarized formats. It is essential to recognize that electronic health information is generated and maintained within specific institutions, such as hospitals, integrated delivery networks, clinics, or physicians' offices. Abdulsalami (2013).

Health Information Management (HIM) represents a specialized management process that integrates clinical expertise, information technology, database management, and administrative oversight, as noted by Waegemann (2012). The domain of health information and records encompasses healthcare planning, management decision-making, legal and administrative protocols, research initiatives, and the identification of trends pertinent to disease treatment, as well as the assessment of standards and quality in patient care. A health record may consist of various health-related documents belonging to an individual, which can exist in physical formats such as films (X-rays), paper notes, or photographs, and increasingly in digital formats on computers.The digital management of health records is referred to as Electronic Health Information Management (e-HIM). According to American Health Information Management Association (AHIMA). (2021). Health Information Management (e-HIM) refers to the use of digital systems, technologies, and processes to manage, secure, and exchange health information. e-HIM integrates traditional Health Information Management (HIM**)** practices with modern technological solutions, ensuring that health data is stored electronically, accessed securely, and shared efficiently among healthcare providers and patients.

Numerous terms have been employed to characterize electronic patient health records, often with overlapping meanings, as highlighted by Waegemann (2012). An electronic health record (EHR) can be succinctly defined as a patient's medical record in a digital format. The electronic health record system facilitates the organization and retrieval of individual health records through computer technology. While both Electronic Health Record (EHR) and Electronic Medical Record (EMR) are widely utilized, some health informatics professionals differentiate between the two, designating EHR as a comprehensive concept and EMR as a specific localized record. Nevertheless, many users tend to use EHR and EMR interchangeably. An EHR system is frequently abbreviated as either EHR or EMR.

As of the year 2000, the adoption of Electronic Health Records (EHRs) and other Health Information Technologies (HITs), such as Computerized Physician Order Entry (CPOE), was quite limited in the United States. Fewer than 10% of American hospitals had implemented HIT (Ringold et al., 2000), and only 16% of Primary Care Physicians utilized EHRs. Between 2001 and 2004, merely 18% of ambulatory care encounters employed an EHR system (Jefferey et al., 2017). By 2005, 25% of office-based physicians reported using either fully or partially electronic medical record systems (EMR). Nevertheless, less than 10% of these physicians had a computerized system for ordering tests, reporting results, and documenting physician notes (National Center for Health Statistics, 2006). In contrast, the healthcare sector in Nigeria lacks EHR systems in smaller private facilities, and in public hospitals, such as specialist and teaching hospitals, where they may exist, they are often in nascent and rudimentary forms (Baronl, 2017). Some health records departments in these institutions primarily utilize computers for administrative tasks. The limited adoption of EHRs in Nigeria can be attributed to various factors, including high costs of hardware and software, complex implementation processes and technical requirements, resistance to organizational change and reforms, inadequate funding and management, as well as challenges related to maintenance.

1.2 Statement of the Problem

The issues arise from a lack of awareness, insufficient training of health information managers, and the collection of irrelevant data by health information personnel. Furthermore, various benefits of the Electronic Health Management System are not being fully realized. Preliminary investigations conducted at ABUTH indicate that the use of electronic systems in managing specific records is inadequate, leading to time wastage in record retrieval and instances of misfiling.

1.3 Objective of the study

1. To determine the amount of adoption of electronic technology for patient record management at ABUTH, Zaria.
2. To investigate the benefits of using electronic technologies to maintain patient records at ABUTH in Zaria.
3. To investigate the impediments to the effective use of electronic technologies in patient record management at ABUTH in Zaria.

1.4 Research Questions

1. What is the amount of utilization of electronic technologies for patient record management at ABUTH, Zaria?
2. What are the benefits of using electronic technologies to maintain patient records at ABUTH, Zaria?
3. What are the barriers to the effective use of electronic technologies in patient record management at ABUTH, Zaria?

1.5 Electronic Data Capturing and Processing

There are two types of electronic management records (EMRs): born digital records and scanned or image records (Hallvard et al, 2013). Born digital records are information captured in a native electronic format that can be entered into a database, transcribed from an electronic tablet network computer, or captured in

other ways from its inception electronically. The data is subsequently transported to a server or another host environment and stored electronically. The second group includes records that were initially created on paper or in other hard copy format (X-ray film images, for example) but were scanned or imaged and transformed to digital form. These records are better defined as digital formats. These records are best defined as digital format records because their content cannot be modified or altered (save for the use of third-party software to add "overlay notations" on electronic records). The majority of medical records created before to the year 2000 fall into this category.

Converting these physical documents to EMR can be costly and time-consuming, and it must be done precisely to assure correct content capture. However, electronic health information management (e-HIM) offers significant benefits over traditional handwritten paper-based medical records. EHIR systems can help to reduce medical errors. The experts believe that medical records have low readability, which can lead to medical errors (Institute of Medicine, 1999). Although using pre-printed forms, standardizing abbreviations, and standards may increase the reliability of paper medical records, electronic records are more dependable in terms of form standardization, terminology and abbreviations, and data input.

Electronic record keeping (ERK) and order entry were discovered to eliminate errors associated with handwritten documents and are suggested for wider use (Institute of Medicine, 2001). EHIR systems are thought to improve physician efficiency and cost-effectiveness while also promoting care uniformity. In 2004, it was projected that one out of every seven hospitalizations in the United States occurred when medical records were not easily accessible, and one out of every five lab tests were repeated because results were not available at the time of care. Electronic medical records are expected to increase efficiency by 60% each year, with the monthly cost of an EMR offset by the cost of a few unneeded tests or admissions.

Manual or paper medical records are stored on "physical" media such as film (X-rays), paper (notes), and photos, which can be of various sizes and formats. Physical storage of such papers may be troublesome because not all document kinds can fit in the same size folders or storage areas. Physical records typically take a substantial amount of space. When physical records are no longer kept, the need for a vast quantity of storage space is eliminated. Paper, films, and other expensive physical media consumption (and thus expense) are also decreased with electronic record keeping. Furthermore, since paper records are maintained in multiple locations, it takes time to collect and bring them to a central location for examination by a healthcare expert. When paper or other sorts of records are required at many places, the expenses of coping, faxing, and transportation are high. Baroni (2017).

1.6 Types of Data Stored in Electronic Medical Records

An electronic medical record may include patient demographics, medical history, examination and progress reports of health and sickness, medication and allergy list, and immunization status. Other information may include laboratory test results, radiographic pictures (X-rays, CTs, MRLS, etc.), photographs from endoscopy or laparoscopy, or clinical photographs, as well as pharmaceutical information, including adverse effects and interactions. Additionally, evidence-based recommendations for individual medical condition records of apartments and other reminders, billing records and advance directives, living wills, and health power of attorney might be incorporated. (www.health.nct.com).

Health Information System and E-Health

Health Information Systems (HIS) and **e-Health** according to World Health Organization. (2016), are critical components in the modern healthcare ecosystem, providing the foundation for the management, analysis, and sharing of health data. These systems enhance healthcare delivery, improve patient outcomes, and ensure that health-related information is securely stored, easily accessed, and efficiently used. Below is an exploration of Health Information Systems (HIS) and e-Health, along with their applications, challenges, and the role of information technology in transforming healthcare.

Health Information Systems (HIS)

Health Information Systems (HIS) refer to systems that capture, store, manage, and share health-related data to improve the quality of care, enhance decision-making, and optimize healthcare processes. HIS can be used at various levels, from individual healthcare settings (e.g., hospitals, clinics) to national health agencies. These systems support the flow of health data and enable decision-making, resource management, and health monitoring.

Key Components of HIS:

1. **Electronic Health Records (EHRs)**: EHRs are digital versions of a patient's medical history and treatment records. They include detailed information such as diagnoses, medications, treatment plans, test results, and vaccination history. EHRs are central to modern HIS and enable healthcare providers to access patient data quickly and securely, improving the continuity and quality of care.
2. **Clinical Decision Support Systems (CDSS)**: CDSS are computer-based systems that analyze patient data and assist healthcare providers by offering clinical recommendations and alerts. These tools help in making evidence-based decisions, reducing errors, and improving the clinical workflow.
3. **Health Information Exchange (HIE)**: HIE refers to the process of electronically transferring health information between different healthcare organizations. It facilitates the sharing of patient records, diagnostic results, and other health information, which can improve the coordination of care across multiple providers and institutions.
4. **Picture Archiving and Communicatio**n **Systems (PACS):** PACS is a medical imaging technology used for storing, retrieving, and sharing images such as X-rays, MRIs, and CT scans. Integrated with HIS, PACS allows for better access to images and enhances diagnostic decision-making.

Applications of HIS:

- **Improved Patient Care**: HIS allows for a more holistic view of a patient's medical history, enabling healthcare providers to make informed decisions.
- **Operational Efficiency**: Automation of administrative and clinical tasks reduces human error, streamlines processes, and saves time and resources.
- **Data Analysis**: HIS collects large volumes of data that can be analyzed to detect trends, optimize workflows, and improve patient outcomes.

Challenges in HIS:

- **Interoperability**: Different healthcare systems may use different formats or technologies, making data exchange difficult. Standardization efforts (e.g., HL7, FHIR) are underway to address these challenges.
- **Data Security and Privacy**: Ensuring that patient data is secure and complies with regulations like **HIPAA** (in the U.S.) and **GDPR** (in the EU) is crucial.
- **Cost and Training**: Implementing and maintaining HIS can be costly, and healthcare professionals need continuous training to effectively use these technologies.

E-Health

E-Health is a broader term that encompasses the use of digital technologies in health services. It includes not only **Health Information Systems (HIS)** but also extends to other digital tools and services that enhance health management, such as telemedicine, mobile health (mHealth), and health-related websites. e-Health aims to improve the quality, efficiency, and accessibility of healthcare services by leveraging information technology.

Key Components of e-Health:

1. **Telemedicine and Telehealth**: Telemedicine refers to the use of telecommunications technology to provide healthcare remotely, including consultations, diagnoses, and treatment planning. This is particularly important for patients in rural or underserved areas. Telehealth is broader, encompassing telemedicine as well as remote patient monitoring and health education.
2. **Mobile Health (mHealth)**: mHealth uses mobile devices like smartphones, tablets, and wearables to monitor health, deliver medical information, and facilitate communication between patients and providers. It includes apps for managing chronic diseases, tracking fitness, and monitoring vital signs.
3. **Patient Portals**: Patient portals are secure online platforms that allow patients to access their health information, book appointments, request prescriptions, and communicate with healthcare providers. These tools are essential for improving patient engagement and empowerment.
4. **Health Websites and Online Health Communities**: These platforms provide health information to the public, enabling individuals to learn about medical conditions, treatments, and preventive care. Online health communities allow patients to share experiences and support each other in managing health conditions.

Applications of e-Health:

- **Improved Access to Healthcare**: e-Health enables patients to receive care remotely, breaking down geographic barriers and improving access to healthcare services.
- **Cost Reduction**: By reducing the need for in-person visits and improving workflow efficiency, e-Health can help lower healthcare costs.
- **Enhanced Patient Engagement**: Digital health tools allow patients to actively participate in their health management, leading to better health outcomes.

Challenges in e-Health:

- **Data Privacy and Security**: As with HIS, e-Health tools handle sensitive health information that must be protected from cyber threats and unauthorized access.
- **Digital Divide**: Not all patients have access to the necessary technology or the internet, which can create disparities in healthcare access.
- **Regulatory Issues**: The use of e-Health platforms is often subject to various regulatory frameworks, including health data protection laws, which can vary by region.

Health Information Systems (HIS) and e-Health in Practice

The integration of HIS and e-Health is driving significant improvements in healthcare delivery. These technologies are helping to:

- **Coordinate Care**: By providing a comprehensive view of a patient's health history, HIS and e-Health systems make it easier for multiple providers to collaborate on patient care, reducing the risk of duplication, errors, and gaps in care.
- **Enable Remote Monitoring**: Through tools like wearable devices and telemedicine, e-Health is making it possible for patients with chronic conditions to be monitored remotely, reducing hospital visits and improving disease management.
- **Support Population Health**: By analyzing aggregated data from HIS and e-Health tools, public health officials can identify trends, track epidemics, and improve health policy.

Barriers to Implementing EHR System

The transition from traditional paper-based records to Electronic Health Records (EHRs) has become a key component of modernizing healthcare systems globally. While the adoption of EHRs offers numerous benefits such as improving patient care, enhancing communication, reducing errors, and streamlining workflows several barriers hinder the widespread implementation of EHR systems. These barriers can be technical, financial, organizational, or regulatory in nature. Below is a discussion of these challenges, along with a citation to a relevant source.

1. Financial Barriers

One of the most significant barriers to implementing EHR systems is the high cost associated with both initial installation and ongoing maintenance. These costs include:

- **Initial Setup**: Purchasing software, hardware, and infrastructure (e.g., servers, workstations) can be expensive for healthcare organizations, particularly for small practices and hospitals. According to a study by Rochlin et al. (2017), the cost of purchasing and implementing an EHR system can range from tens of thousands to millions of dollars, depending on the size and complexity of the healthcare organization.
- **Training Costs**: Training healthcare providers and staff on how to use EHR systems is another costly and time-consuming process. These training programs often need to be ongoing, as updates and new features are introduced.
- **Maintenance and Support**: Regular software updates, system maintenance, and technical support add to the ongoing costs. Smaller healthcare organizations, especially in underserved areas, may struggle with these financial demands.

2. Technical Barriers

Technical challenges also play a significant role in hindering the implementation of EHRs:

- **System Compatibility and Interoperability**: One of the primary obstacles is ensuring that EHR systems can **interoperate** with other healthcare technologies. Inconsistent data formats and lack of universal standards can make it difficult for EHRs to communicate with other systems such as laboratory databases, imaging systems, and other health information systems. **Lack of interoperability** between different EHR systems and across various healthcare providers can result in fragmented patient information, which undermines the benefits of EHRs (Buntin et al., 2011).
- **Data Migration**: Migrating from paper-based records to an electronic system is often a complex and error-prone process. Converting large volumes of data accurately and efficiently without disrupting day-to-day operations is a major challenge, especially in large hospitals or healthcare networks with years of accumulated data.
- **Cybersecurity Concerns**: Ensuring the **security and privacy** of patient data is a critical concern. Healthcare organizations are frequently targeted by cyberattacks, and any breach in the EHR system could lead to serious consequences. Protecting sensitive patient information from unauthorized access, hacking, and data theft is a major technical challenge for healthcare institutions (Ponemon Institute, 2020).

3. Organizational and Workflow Barriers

Successful EHR implementation requires more than just technology; it also requires significant changes in workflow and organizational culture. Key challenges in this area include:

- **Resistance to Change**: Healthcare professionals, including doctors, nurses, and administrative staff, may be resistant to adopting new technologies. This resistance can be due to concerns over increased workload, the learning curve associated with new systems, or skepticism about the potential benefits. In fact, many healthcare professionals are accustomed to paper-based systems and may find it difficult to transition to digital platforms (Buntin et al., 2011).
- **Workflow Disruptions**: Implementing an EHR system often requires redesigning workflows to ensure that the system fits smoothly into existing clinical practices. For instance, doctors may need to adjust their patient consultation processes to accommodate data entry into the EHR, which could slow down the workflow in the short term and affect productivity.
- **Lack of Leadership and Training**: Effective leadership is critical for the successful implementation of EHRs. Without strong guidance, planning, and management, the implementation process can fail. Insufficient staff training and a lack of adequate support can also lead to inefficient use of the system, mistakes, and frustration among healthcare professionals.

4. Regulatory and Legal Barriers

Regulatory issues and compliance concerns also present significant challenges:

- **Regulatory Requirements**: In many countries, healthcare organizations are required to comply with stringent **health data privacy** and **security regulations**. For instance, in the United States, the **Health Insurance Portability and Accountability Act (HIPAA)** mandates that EHR systems meet specific standards for data security, privacy, and patient consent. Healthcare organizations must ensure that their EHR systems comply with these regulations, which can be time-consuming and costly.
- **Legal Liability and Accountability**: There are concerns about **legal liability** when using electronic systems. If an EHR system malfunctions, resulting in incorrect patient data or miscommunication, it could lead to legal repercussions for the healthcare provider. Ensuring that EHR systems are both reliable and legally defensible is a significant concern.

5. Concerns about Data Quality and Accuracy

EHR systems depend on accurate and timely data entry to function effectively. **Data quality issues**, such as incomplete, inconsistent, or incorrect information, can undermine the effectiveness of an EHR system. Common issues include:

- **Data Entry Errors**: Inaccurate data entry by healthcare providers can lead to incorrect patient records, which can adversely affect diagnosis, treatment, and patient safety.
- **Standardization of Data**: Inconsistent documentation practices across different providers and organizations can make it difficult to ensure uniformity and accuracy in EHR data. Developing standardized practices for entering and updating data is essential for maximizing the value of EHR systems.

While the **implementation of EHR systems** offers substantial potential for improving healthcare quality, efficiency, and safety, numerous barriersranging from financial and technical challenges to organizational and regulatory issues must be addressed. Overcoming these barriers requires a concerted effort from healthcare providers, policymakers, and technology vendors to ensure that EHR systems are accessible, secure, interoperable, and effective in meeting the needs of both healthcare providers and patients.

Inertia

Software technology evolves at a rapid pace. Most software systems require periodic updates, which can be costly in the long run. Some types of software and operating systems require full-scale re-implementation on a regular basis, disrupting not only the budget but also workflow. Physicians like modular upgrades and the opportunity to continuously personalize without requiring large-scale reimplementation. Training

personnel to use an EHR system is expensive. New staff, whether permanent or temporary, will also require training when they are employed. Most large organizations resist change. Management must anticipate the institutional stress that comes with establishing a new large-scale system. According to the National Resource Centre for Health Information Technology, the Agency for Health Care Research and Quality believes that EHR deployment adheres to the 80/20 rule that is 80% of the work of implementation must be spent on issues or change management, while only 20% is spent on technical issues related to the technology itself. Naini (2017).

Legal hurdles and liability in all facets of health in the twenty-first century were becoming increasingly problematic in the 1990s and 2000s. The growth in the per capita number of attorneys, as well as changes in the tort system, drove up the expense of all aspects of healthcare, including healthcare technology. Failure or damage caused during the installation or operation of an EHR system has been viewed as a potential legal threat. This liability problem was especially important for small IJIR system manufacturers. Given the regional liability climate, some smaller enterprises may be pushed to exit markets. Larger EHR providers (or government-sponsored providers of EHRs) can better survive legal challenges to successful deployment. Generally, individuals and organizations have initial resistance to change. Management must anticipate the institutional stress that comes with establishing a new large-scale system. Other key concerns to address include legal hurdles, such as liability (Laura, 2017), and digital signatures (American Bar Association, 2006). Security and information in EHR are not given adequate consideration. This presents a considerable hurdle to the adoption of an EHR. Adoption or an EHR requires a shift in "attitudes, awareness, and capabilities in the areas of privacy and security" of individual health records at the federal level. Many companies in the private sector are working to create, construct, and deploy medical records bands and health information sharing. By legislation, businesses are expected to comply with practices that have been in effect for the federal government for years. This includes two ideas, standardized.

1.7 Global Successes and Failure in the Implementations of EHR Systems

Record (EHR) Systems

The implementation of **Electronic Health Record (EHR)** systems worldwide has had varying levels of success, shaped by local healthcare contexts, technological infrastructure, regulatory environments, and cultural factors. While many countries have successfully integrated EHRs into their healthcare systems, others have faced significant challenges. This section explores **global successes and failures** in the implementation of EHR systems, discussing both positive outcomes and the reasons behind setbacks.

Successes in the Implementation of EHR Systems

Several countries and regions have experienced notable success in adopting EHR systems, leveraging technology to improve healthcare quality, patient safety, and operational efficiency.

1. The United States: The Meaningful Use Program

The U.S. has seen significant progress in the adoption of EHRs, largely due to government incentives and regulatory frameworks, particularly through the Meaningful Use Program, which was launched as part of the Health Information Technology for Economic and Clinical Health (HITECH) Act in 2009. The program offered financial incentives to healthcare providers who demonstrated "meaningful use" of certified EHR systems to improve patient care.

Key successes in the U.S. include:

- **Increased Adoption**: According to a study by DesRoches et al. (2013), the adoption of EHRs in U.S. hospitals increased from 12% in 2009 to 44% by 2012.

- **Improved Care Coordination**: EHRs have facilitated better communication between healthcare providers, leading to improved care coordination, particularly in managing chronic diseases and reducing medical errors.
- **Reduction in Duplicate Testing**: EHRs have helped reduce redundant testing, as patient information is available at the point of care, leading to cost savings and reduced patient exposure to unnecessary procedures.

However, challenges remain, including issues related to interoperability, data privacy concerns, and the high costs of EHR implementation for small practices and rural healthcare settings.

2. The United Kingdom: NHS Electronic Patient Record System

The **National Health Service (NHS)** in the UK made an ambitious attempt to implement an electronic patient record system. The National Programme for IT (NPfIT), launched in the early 2000s, aimed to digitize health records for all NHS patients by creating a unified, nationwide system. While the NPfIT faced difficulties, certain successes have emerged from ongoing efforts.

Key successes in the UK include:

- **Regional EHR Adoption**: While the national program faced delays and budget overruns, certain regions, such as Scotland, have successfully implemented EHRs, improving data sharing between healthcare providers and enhancing patient safety.
- **Integration with Primary Care**: The integration of EHR systems in primary care settings has led to better patient tracking, improved preventive care, and a reduction in administrative burdens for general practitioners.

In 2011, the UK's National Programme for IT was effectively scrapped, largely due to the program's failure to meet its original objectives, highlighting the challenges of implementing large-scale IT projects in a complex, decentralized healthcare system.

3. Estonia: Digital Health System and E-Health Records

Estonia is often cited as a global leader in digital health, having successfully implemented a nationwide EHR system that integrates both healthcare and government services. Estonia's digital health infrastructure is robust, with 99% of residents having a personal identification code that links all their healthcare data and allows for easy access to health services online.

Key successes in Estonia include:

- **Universal Access to Health Records**: Estonia's **X-Road** system allows healthcare providers to access patient records in real-time, improving efficiency, care quality, and coordination across different sectors.
- **Patient Empowerment**: The system allows patients to access their health data and control who can access it, leading to increased patient engagement and empowerment.
- **Cost Efficiency**: Estonia's investment in digital health has resulted in cost savings and increased operational efficiency, with reduced administrative workloads and enhanced data accuracy (Kettunen et al., 2019).

Estonia's success has largely been attributed to strong governmental support, early investment in digital infrastructure, and a population comfortable with using technology in everyday life.

Failures in EHR System Implementation

Despite notable successes, many countries have faced significant challenges in implementing EHR systems, leading to costly delays, poor adoption, and system failures.

1. The United States: The "Meaningful Use" Criticism and Failure in Small Practices

While the U.S. has seen widespread adoption of EHRs, several challenges have persisted:

- **Small Practice Failures**: Many small healthcare practices have struggled to implement EHRs due to the financial burden of acquiring, maintaining, and upgrading the systems. As reported by Adler-Milstein and Jha (2017), smaller practices often lack the resources to ensure that EHR systems are used effectively.
- **Interoperability Issues**: One of the major criticisms of the U.S. EHR system is its lack of interoperability. Despite the widespread adoption of EHRs, many systems are unable to communicate with each other, leading to fragmented patient data and inefficiencies in care delivery.

2. Canada: The "Canada Health Infoway" Project

Canada has also faced challenges in implementing a nationwide EHR system through its Canada Health Infoway initiative, which aims to connect EHR systems across provinces. Although progress has been made, there are notable regional disparities in the implementation and usage of EHRs.

Key challenges include:

- **Slow Adoption**: Several provinces have been slow to implement EHRs, and there has been a lack of standardized practices across different regions. This lack of uniformity has hindered the goal of creating a fully integrated national health system.
- **Interoperability Issues**: Similar to the U.S., Canada has struggled with ensuring that EHRs can communicate across provincial borders, making it difficult for healthcare providers to access comprehensive patient data when patients move between provinces (Rochlin et al., 2017).

3. Australia: National E-Health System Setbacks

Australia's attempt to roll out a national EHR system known as the Personally Controlled Electronic Health Record (PCEHR) was launched in 2012 but faced significant setbacks, leading to a major revamp in 2016.

Reasons for failure include:

- **Technical and Design Failures**: The original design did not meet the needs of both patients and healthcare providers, and many healthcare professionals found the system cumbersome and difficult to use.
- **Low Adoption Rates**: Many healthcare providers were unwilling to use the system due to its complexity and lack of clear benefits. Despite government incentives, uptake was slow, leading to underutilization of the system.
- **Privacy Concerns**: The system raised significant privacy concerns, particularly regarding patient consent and access to personal health information, which led to reluctance from patients and providers alike (Grosvenor, 2016).

The implementation of EHR systems has been a transformative initiative in healthcare, with varying degrees of success and failure across the globe. While countries like Estonia and regions within the U.S. and U.K. have seen substantial benefits, including improved care coordination and patient safety, others have struggled with technical difficulties, financial constraints, regulatory challenges, and lack of interoperability. The key takeaway is that successful EHR implementation requires a combination of strong governmental

support, robust infrastructure, clear regulatory frameworks, and buy-in from healthcare providers and patients.

1.8 Benefits of EHR Standardization and National Healthcare Information Network

1. Improve Billing Accuracy
Although billing is now primarily done electronically in the United States, these claims frequently necessitate supplementary proof from a patient's medical record. This is a time-consuming operation when the records are in an electronic format that is incompatible with the billing program or in paper format. An integrated electronic medical record maker ensures that billing proceeds accurately. This could be adopted.

2. Reduced Duplication of Services

Duplicate laboratory testing, diagnostic imaging, and other services can be avoided with proper record keeping. However, because electronic records can be available at numerous sites simultaneously, integration of services and knowledge of duplication is simplified.

3. Improved Access to Medical Records

Records are often placed in long-term storage after a few years because they must be retained for as long as 21 years, depending on the circumstance. Electronic medical records enables health organizations to rapidly retrieve historical records, which can then be forwarded to another health organization in the event of an emergency. Many EHR systems now include an integrated patient portal or personal Health Record System, allowing patients and other parties to access medical records using a secure login and password. Straltz et al (2017).

4. Facilitation of clinical trials

Clinicians and researchers see advantages to combining electronic health records with data gathering and analysis in clinical trials. According to Oluwasanme (2017), complete computerized health information is stored in a central computer with inputs and output devices in each patients care area would provide such as unit records and a high quality or patient care through all phases of an illness. EHR will improve all

1. Patient Registration: With the manual system or operation at the registration centers in health institutions, there is much to talk about in terms of misfiling and duplication of records, which is due to illegible handwriting and incorrect spelling of patients' names and other related data. This is where EHR can be used to its best potential.
2. Patient Treatment: EHR allows for continuity of treatment while avoiding repetition of investigations, saving time and money on patient treatment. If all relevant data from all previous investigations and treatments were linked together using a computer, it would help to provide effective patient care.
3. Assisting Communication: Because patient care is a team effort, doctors, nurses, medical social workers, physiotherapists, and others participate in the patient's final treatment. Individual patients' health information is stored electronically so that other members of the treatment team can easily access it.
4. Research and Assessment of Medical Care: The usage of electronic health records can assist doctors in connecting with health information management to review patient situations. This is to reconsider the treatment supplied for specific diseases and illnesses as an improvement on earlier efforts to reach a better result.
5. Medical Examination: Because EHR increases efficiency and reliability, it may be valuable in education and research.
6. Data Bank: The proceeds from the U IR in health information would be used to build a data bank. This data bank will offer the hospital management with useful information from which to make informed decisions. They will collect factual qualitative data that can be utilized to assess patient care and improve services, facilities, and efficiency.
7. Confidentiality of Record: In some hospitals where records are bound together and placed wherever they want, and where open shelves systems of filling are maintained with the system, a

major issue is ensuring the confidentiality of information stored, and health records are concerned with the possibility of loss of privacy or the individual. It is then demonstrated that information saved on computers can be secured against release to unauthorized persons. Thus, they can be maintained by the use of system password whereby it is only the authorize person that will be able to open the system.

8. Retrieval of Records: Manual record retrieval is always faulty, generating a ripple effect from the library to the ward and catchment region. In addition, when tracking a certain record, the personnel experienced excruciating pain and died prematurely. There are some situations when the adoption of EHR can provide a solution.
9. Litigation: Health information can be used as documentary proof to defend the patient against incorrect treatment or claims of insurance benefits. Furthermore, the health information as evidence might be quite valuable in a court case made against the institution as a whole. As a result, when electronic health information is thorough and reliable, it can benefit both the patient and the hospital in court.
10. Potential Clinical: trial participants may be easier to identify, administrative overhead costs may be lowered, data inaccuracies may be eliminated, and unfavorable results may be detected more quickly. Some institutions have already achieved some success in building and integrating a coordinated data collecting and analysis system. For example, the Shared Pathology Network of the national cancer institute AHS successfully built a web-based network for locating pathological tissue samples at a project and was found adequate for EU use. Walker et al. (2015)

1.9 Electronic Prescription (E-Rx)

Electronic prescribing, also known as e-prescribing (e-Rx), is a means of electronically sending prescriptions for specific patients to pharmacies via a doctor or healthcare practitioner. Instead of writing a prescription and delivering it to the patient's pharmacy, the doctor orders the medication via the office computer, which subsequently transmits a secure electronic prescription to the pharmacist.

1. Electronic prescriptions can avoid errors caused by handwriting or misinterpretation by pharmacists.
2. The doctor can check the individual's health plan drug formula to ensure the requested prescription is covered.
3. Inform the doctor about any drugs being ordered that may interact with the prescription to avoid dangerous interactions.
4. Avoid harmful drug interactions by letting the doctor know the drugs being ordered and may interact with a medication that is already taking. Baroni (2017).

1.10 The Role of ICT in Assessment of E-Health Information Management System

ICT plays several roles in assessing information management systems, including the following:

1. ICT enhances healthcare delivery and efficiency.
2. ICT improves the quality and safety of patient cases.
3. ICT can improve the quality, safety, and efficiency of health information management practices.
4. They promote healthcare delivery by improving administration and providing information to professionals.
5. It enables individuals, medical experts, and healthcare providers to access information, communicate with professionals, and give first-line help, especially in remote locations.
6. It provides opportunities for individual, medical professional and healthcare providers, to obtain information, communicate with professionals and deliver first-line support especially where distance is a critical factor.
7. ICT can improve quality of life by facilitating access to medical knowledge and interventions for healthcare workers.

8. Telemedicine innovation can reduce primary healthcare costs by eliminating the need for remote workers to miss work and salaries to seek medical attention for minor ailments.
9. ICT has the ability to impact various aspects of the healthcare sector.
10. ICT can empower patients to manage chronic disorders such as diabetes, asthma, and heart disease by promoting self-care. Abdulsalami (2013). ICT will help in the enhancement of quality of life by increasing access to medical knowledge and medical interventions to health workers.
11. Primary healthcare cost can be cut where remote access can be facilitated through innovation in telemedicine, cutting down the need for those in remote access to forgo today's work and wages in trying to get to a doctor for minor ailments.
12. ICT has the potentials to impact almost every aspect of the health sector.
13. ICT can also help patients become more involved in their own care which is especially important in managing chronic conditions like diabetes, asthma or heart diseases. Abdulsalami (2013).

Advantages of Electronic Medical Records

Electronic health records (EHRs) create a digital health care infrastructure that encompasses and leverages digital progress and can transform the way care is delivered and compensated. Our world has been transformed by digital technology--smartphones, tablets, and heel-enabled devices have transformed our daily lives and the way we communicate. Medicine is an information-rich enterprise.

1. Physicians and nurses have more time with patients. With paper records, healthcare personnel spend just as much time performing administrative chores as they do caring for patients; too much important time is spent searching for and waiting for information in a paper-based system.
2. Ensure your health information is up to date. There is no delay as handwritten notes await transcription. Your EMR stores all of your medical history, including test results.
3. Increased legibility, correctness, and completeness. An EMR reduces the risk of medical errors while also improving the quality and safety of patient care. There is no replacement for having precise information about a patient's condition and medical history readily available.
4. Allergic and unpleasant pharmacological responses are prevalent.
5. EMR allows several users to access your record at the same time. For example, while the nurse records your vital signs and the purpose for your visit, the practitioner can simultaneously check your paperwork before seeing you.
6. Set reminders for health maintenance tests and procedures.
7. Your prescription is ordered electronically and delivered to your pharmacy. Osayi (2017).

Electronic health records, like paper records, must adhere to the Federal Health Insurance Portability and Accountability Act (FHIPAA) in order to safeguard patient privacy. However, unlike paper records, electronic health records can be encoded so that only authorized personnel can access them.

When tangible records are no longer necessary, they typically take up a large amount of storage space. Electronic record storage also reduces the use of paper, film, and other expensive physical media (and their associated costs). Handwritten paper records can be associated with poor legibility, which can lead to medical errors; therefore, electronic records aid in the standardization of forms, terminology, and abbreviations, as well as data input. Digitalization or Corms facilitates the collection of data for epidemiology and clinical studies.

In contrast, electronic health records (EHRs) can be updated continuously. Interoperability, or the capacity to exchange records between multiple EHR systems, would help coordinate healthcare delivery in non-affiliated facilities. Furthermore, data from an electronic system can be used anonymously for statistical reporting in areas like quality improvement, resource management, and public health communicable disease surveillance. Nainil (2017).

Ownership of Patient's Record

Ownership and keeping of patient's records varies from country to country.

In the United States, the patient owns the data included in the medical record, while the body responsible for preserving the record owns the physical form (according to the Health Insurance Portability and Accountability Act). Patients have the right to ensure that the information in their records is correct, and they can ask their health care practitioner to fix factual errors.

In the United Kingdom, ownership of the National Health Service (NHS) medical records has historically been defined as belonging to the Secretary of State for Health, which is interpreted to suggest that copyright also belongs to the authorities.

In Germany, a relatively new law, passed in 2013, protects patients' rights by stating, among other things, that medical workers have a legislative duty to document the patient's treatment in either hard copy or electronic patient record (EPR). This documentation must be completed in a timely manner and include all forms of treatment received by the patient, as well as other relevant information such as the patient's care history, diagnosis, findings, treatment results, therapies and their effects, surgical interventions and their effects, and informed consent. According to Abdulsalami (2013), medical health record information should cover almost everything that is functionally important for both current and future therapy. The documentation must additionally include. This documentation must also include the medical report and must be archived by the attending physicians for at least 10 years. The law clearly states that these records are not only memory aids for the physicians, but also should be kept for the patient and must be presented on request

Accessibility

In the United States, the most fundamental regulations governing access to a medical record state that only the patient and health-care practitioners actively involved in providing care have the right to read it. However, the patient has the option of allowing any person or entity to assess the record. The comprehensive requirements for access and security under the Health Insurance Portability and Accountability Act (HIPAA) are being strengthened internationally. In certain cases, the rules get more difficult.

Capacity

When a patient lacks capacity (is legally unable) to make decisions about his or her own care, a legal guardian is appointed (either by next of kin or by court or legislation if no kin exist). Legal guardians have the ability to access the medical record in order to make medical decision on the patient's behalf.

Destruction

In general, entities that have medical records must keep them for a set amount of time. In the United Kingdom, medical records are required for the patient's lifetime and legally for as long as a complaint action can be filed. In the UK, any recorded information should be legally preserved for 7 years, but medical records must be retained for an extra 20 years until a child reaches the age of responsibility. Medical records are necessary several years after a patient's death to investigate illness among a community (e.g., industrial or environmental disease, or even deaths at the hands of doctors who commit murders, as in the Harold Shipman case).

Data Breach

Given the number of medical data breaches and a lack of public trust, some countries have enacted laws requiring safeguards to be put in place to protect the security and confidentiality of medical information as it is shared electronically, as well as giving patients important rights to monitor their medical records and receive notification of loss and unauthorized acquisition of health information.

Methodology

A non-experimental descriptive study design using a survey was used. This is because it does not include administration or treatment, as in an experiment; instead, the goal is to characterize what exists in terms of the variables or conditions in a situation. The study population consists of 36 Health Information Management staff members from various departments at ABUTH, Zaria, including the School of Nursing, School of Midwifery and Post Basic Nursing, School of Health Information Management, School of Medical Laboratory Technology, School of Biomedical Engineering, and Residency, Training Programmes. The research apparatus used was a standardized questionnaire to obtain important data on the research issue. The acquired data was examined by tabulation and basic percentages.

Response Rate

In total, 36 questionnaires were distributed and collected from the field. The 36 (100%) were completed, retuned, and declared suitable for the study.

Table 1: What is the level of Use of Electronic Systems in Management of Patient Records in ABUTH

Options	Respondents	Percentage (%)
Level of Use	22	61.11%
Not in Use	-	-
Undecided	14	38.89%
Total	36	100%

Table 1 shows that 22 respondents, or 61.11%, are aware of and use electronic health records, while 14 respondents, or 38.89%, are undecided. Those undecided could be assumed to be not in use because medical records are shared by various departments/schools within ABUTH, such as the school of nursing and the school of midwifery. As a result of the data, it is obvious that the vast majority of respondents are aware of electronic health records at ABUTH in Zaria.

Question 1b: Respondents view on whether there is *an* existing electronic health record in ABUTH

Options	Respondents	Percentage (%)
Existing	8	22.22
Not Existing	19	52.78
Undecided	9	25
Total	**36**	**100%**

Table 1b shows the respondents' views on the existing electronic health record in ABUTH; the results show that 8 respondents (22.22%) agree, 19 respondents (52.78%) disagree, and 9 respondents (25%) are undecided. This means that the majority of respondents dispute about the existence of an electronic health record in ABUTH.

Table 1c: Respondents views were seek on the implication of electronic health record in the healthcare services.

Options	Respondents	Percentage (%)
It has Implication	18	50
No Implication	10	27.78
Undecided	8	22.22
Total	**36**	**100%**

Table 1c shows that 18 respondents (50%) agree that electronic health records have an impact on healthcare services, whereas 10 respondents (27.78%) disagree and 8 respondents (22.22%) are undecided. However, based on the data, the majority of respondents agree that electronic health records have an impact on healthcare services.

Question 1d: Respondents opinion were seek if EHIM system is very complicated and too cumbersome to operate

Options	Respondents	Percentage (%)
Cumbersome	19	52.78
Not Cumbersome	11	30.56
Undecided	6	16.67
Total	36	100%

Table 1d; the respondents' opinions were sought regarding whether the EHIM system was very complicated and cumbersome to operate. The results revealed that 19 respondents (52.78%) agreed that the system is very complicated and too cumbersome to operate, while 11 respondents (30.56%) disagreed and 6 respondents (16.67%) were undecided. According to the findings, the majority of respondents agreed that the EHIM system is very complicated and cumbersome to operate.

Table 2: What are the Benefits of the Application of Electronic Systems in the Management of Patient Records in ABUTH, Zaria.

Options	Respondents	Percentage (%)
It has Benefits	20	55.56
No Benefits	9	25
Undecided	7	19.44
Total	**36**	**100%**

Table 2 shows that 20 respondents (55.56%) believe that using electronic systems to manage patient records at ABUTH in Zaria has benefits, whereas 9 respondents (25% disagree) and 7 respondents (19.44%) are undecided. To summarize, ABUTH has qualified HER users within its Health Information Management Department staff.

Table 2a: Respondents opinion on whether the electronic system takes too long to upgrade a file?

Options	Respondents	Percentage (%)
Easy upgrade of file	6	16.67
Uneasy upgrade of file	23	63.89
Undecided	7	19.44
Total	36	100%

Table 2a shows that 23 respondents (63.89%) believe the electronic system takes too long to upgrade a file, whereas 6 respondents (16.67%) disagree and 7 respondents (19.44%) are undecided. The data show that the majority of respondents dissatisfied with the computerized approach, which takes too long to upgrade a file.

Table 2b: With the epileptic power supply in the country will there be accurate and prompt access to patient's record?

Options	Respondents	Percentage (%)
Prompt access to patient's record	30	83.33
Unable to access patient's record at good time	6	16.67
Undecided	0	0
Total	**36**	**100%**

Table 2b focuses on timely access to the patient's records. The findings show that 30 respondents (83.33%) agreed that there was accurate and timely access to the patient's record despite the epileptic power supply, whereas 6 respondents (16.67%) disagreed. According to the research findings, the majority of respondents felt that the country's epileptic power supply interferes with accurate and timely access to patients' records.

Table 2c: Does EHR reduce duplication of laboratory test result?

Options	Respondents	Percentage (%)
Yes	26	72.22
No	10	27.78
Undecided	0	0

Total	**36**	**100%**

Table 2c discusses the issue of duplicated laboratory test results and how electronic healthcare records (EHR) can help to alleviate this problem. The data show that 26 respondents, or 72.22%, agreed that EHR may successfully eliminate duplication of laboratory test results, whereas 10 respondents, or 27.78%, disagreed. It is clear that the majority of participants in this survey believe that EHR can play an important role in reducing redundant laboratory testing.

Table 3: What are the Challenges to Effective Application of Electronic System in the Management of Patients Records in ABUTH, Zaria

Options	Respondents	Percentage (%)
Epileptic power supply	12	33.33
Lack of staff training and retraining	10	27.78
Lack of maintenance culture	14	38.89
Total	**36**	**100%**

Table 3 shows that 14 respondents (38.89%) agreed that a lack of maintenance culture is the most significant effect of an electronic system in the management of patient records, while 12 respondents (33.33%) believe epileptic power supply is the most significant, and 10 respondents (27.78%) believe impromptu staff training and retraining is the most important. This means that the majority of respondents identified lack of maintenance culture, epileptic power supply, and a lack of staff training and retraining as among the problems of using an electronic system to manage patient records at ABUTH, Zaria.

Table 4 by improving the accuracy and clarity of medical record can EHR reduce the incidence of medical errors? (Strategies)

Options	Respondents	Percentage (%)
Yes	29	80.56
No	7	19.44
Undecided	0	0
Total	**36**	**100%**

Table 4 shows that 29 respondents (80.56%) agreed that EHR can reduce the occurrence of errors by enhancing the accuracy and clarity of medical records, whereas 7 respondents (19.44%) disagreed. Again, the majority of respondents believed that EHR could reduce the number of errors by improving the quality and clarity of medical records.

Discussion of Findings

According to the findings, 22 respondents (61.11%) are aware of and use electronic health records, while 14 respondents (38.89%) are undecided, 8 respondents (22.22%) agree that an electronic health record

exists in ABUTH, 19 respondents (52.78%) disagree, and 9 respondents (25%) are undecided. It can be shown that 18 respondents (50%) agree that electronic health records have an impact on healthcare services, whereas 10 respondents (27.78%) disagree and 8 respondents (22.22%) are undecided. The respondents' opinions were sought to determine whether the EHIM system was very complicated and cumbersome to operate. The results revealed that 19 respondents representing 52.78% agreed that the system is very complicated and too cumbersome to operate, while 11 respondents representing 30.56%

Opine the operational system not cumbersome while 9 respondents representing 25% disagree and 7 respondents representing 19.44% were undecided. 23 respondents representing 63.89% opine that electronic system takes too long a time to upgrade a file, while 6 respondents representing 16.67% disagreed and 7 respondents representing 19.44% were undecided.

The findings show that 30 respondents (83.33%) agreed that there was accurate and timely access to the patient's record despite the epileptic power supply, whereas 6 respondents (16.67%) disagreed. The duplication of laboratory test results and if an electronic healthcare record can reduce it. The results suggest that 26 respondents (72.22%) agreed that EHR can eliminate duplicate laboratory test results, whereas 10 respondents (27.78%) disagreed. 14 respondents (38.89%) agreed that a lack of maintenance culture is the most significant effect of an electronic system on patient record management, while 12 respondents (33.33%) believe epileptic power supply is the most important factor, and 10 respondents (27.78%) believe impromptu staff training and retraining is essential. The statistics suggest that 29 responses constitute 80.56% agreed that EHR can reduce the incidence of errors by improving the accuracy and clarity of medical records, while 7 respondents representing 19.44% disagreed.

Conclusion

During the research, the researcher studied raw data from the region of study and demonstrated that Assessment of e-Health Information Management System cannot be underestimated in terms of improving an effective and efficient healthcare system. The start-up cost of fully integrating health delivery procedures, organizational fear of change, government policies, and a lack of resources, among other factors, are key impediments to implementing an EHR system in the healthcare sector.

Recommendations

1. Based on the inquiry and conclusions, the researcher advised that management and the government play a larger role through the following:
   Providing access to internet and computers.
2. Ensuring appropriate funding for purchasing and maintaining ICT gear.
3. Provide hands-on computer training for health records personnel.
4. Ensuring consistent power supply and encouraging effective organizational design.
5. Implement a strong maintenance culture to ensure efficiency.
6. Proper database maintenance is necessary to prevent system breakdowns.
7. As healthcare organizations transition to fully functional EHRs, they must establish medical rules and procedures.
8. Healthcare organizations should maintain the integrity of health records during the transition process.
9. Successful transitions from paper to electronic health records (EHR) need management at multiple levels, including administrative, resource, financial, and infrastructure.
10. Prioritizing patient safety, best practices, ROI, and end-user needs.
11. The system should be straightforward to navigate.

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CHAPTER TWO

AVAILABILITY, AWARENESS AND USE OF ELECTRONIC INFORMATION RESOURCES AMONGST LIBRARY REGISTERED STUDENTS IN FEDERAL UNIVERSITY LAFIA AND NASARAWA STATE UNIVERSITY KEFFI, NIGERIA.

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AVAILABILITY, AWARENESS AND USE OF ELECTRONIC INFORMATION RESOURCES AMONGST LIBRARY REGISTERED STUDENTS IN FEDERAL UNIVERSITY LAFIA AND NASARAWA STATE UNIVERSITY KEFFI, NIGERIA.

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Abstract

This study investigated the availability, awareness and use of electronic resources by Students in Federal university, Lafia and Nasarawa State University, Keffi. The specific objectives of the study were to find out the available and use of electronic information resources in the two universities in Nasarawa State; extent of awareness of the available electronic information resources; and factors that hinder the students awareness of electronic information resources by University students in Nasarawa State. Three research questions were raised in line with the objectives of the study and two hypotheses was formulated. The study adopted survey research design. The population of the study was 7233 registered library users from two (2) Universities in Nasarawa State. A sample size of 379 users were drawn from the entire population through stratified random sampling technique. Data was collected through questionnaire. Data collected for the study was analyzed using Mean Scores and Standard Deviations while null hypotheses was tested at 0.05 level of significance using chi-square statistic. The findings of the study revealed that there are several available electronic information resources such as E-books, E-journals, E-newspapers, E-magazines, E-preprints, CD ROM, E-projects, E-lecture notes, E-research reports, Online databases and internet services in the two universities libraries sample; Students are aware of the available electronic information resources; while it was also reveal that students are awareness of the available electronic information resources for use by the students. The study reveals Lack of advanced searching skill, navigation problems, library staff indifference, poor internet connectivity, technological constraint, lack of ICT skill, student poor orientation, frequent breakdown of system, lack of personal laptop and other electronic gadget, erratic power supply and lack of awareness and use of electronic information resources by some students. The test also reveal that electronic information resource significantly influence students usage of Electronic information resources by universities students in Nasarawa State; The study recommends that computer room or ICT centers be created in faculties and departments to ease congestion and make it easily accessible to students among others.

Key Words: Awareness, Usage, Resources, Information, Electronic information Resources.

2.1 Introduction

Electronic information resources, (Electronic Resources or E-resources) are collections of information in electronic or digital format that are accessed on an electronic device, such as a mobile phone, computer. These are published resources in electronic versions/format such as encyclopedias, pamphlets, e-books, e-journals, databases. An electronic information resource (e-resources) is defined as the information that is accessed via the internet (Okore, 2019). This definition was extended to include CD ROMs because CD-ROMs resources can be accessed online (Ugwu & Onyegiri, 2012), Okore, (2019),identified specific type of electronic information resources as consisting of electronic books (e-books), electronic journals (e-journals), indexes, collections of databases and websites. Electronic resources are the electronic representation of information that are available in various forms like e-books, digital libraries, online journal magazine, e-learning tutors and on line test. Because of the effective presentation with multimedia tools, these e-resources have become the source of information. Electronic resources delivers the collection of information as full text databases, e-journals, image collections, multimedia in the form of CD, tape, internet, web technology.

Electronic information resources are resources that are generated through some electronic medium (internet and computer) and made available to wider range of viewers both onsite or off-site via some electronic transforming machine or internet. Resources may include e-journals, e-discussions, e-news, data archives, e-mail on line chatting, ebooks can be called as an e-resources. Electronic information source are a wide range of products going from electronic periodicals to CD-ROMs, from mailing list to databases, all of them having a common feature of being used and sometime modified by a computer while the internet provides a broad range of information via search engines, subject gateways, subject directories and other web-based resources, (Aina, 2014). Electronic resources are information resources provided in electronic

form, and these include resources available on the Internet such as e-books e-journals, online database, CD-ROM databases and other computer –based electronic networks, among others Tsakonas, (2016).

Electronic information resources have become essential for the universities studies, and are very popular to most of the student because they can provide a number of advantages over traditional print based sources. The advantages of networking and use of electronic resources as follows: The information needed can be delivered from the most appropriate sources to the user; the user can re-specify his or her needs dynamically; the information is obtained when it is wanted, the user selects only the information needed to answer the specific question and finally, the information is stored only if the user wishes and very often by user, not the library. The potential of electronic information resources can only be of a benefit to students and researcher if they are aware of its existence.

Awareness is defined as an understanding of the activities of other, which provides a context for your own activity Ezema, (2015). Awareness as a state of consciousness and purpose was viewed by Chinedu, (2015) as the condition of being aware and able to understand what is happening around one. Awareness is the state or ability to perceive, to feel or to be conscious of events, objects or sensory patterns. Awareness means having idea of the existence of something. To be aware means to have knowledge or idea of something, somebody, an event, a place or information that one needs. In this context, it means being aware of the electronic information resources that students can use to aid their studies and research. Awareness of the electronic information resources (EIRs) could be done in varieties of ways which include: User education which according to Okafor and Ukuoma, (2018) has become more demanding with the multiple formats, huge volume and dubious quantity and quality of information available in the internet. User studies will involve integration of information skill with teaching, research and enterprise programmes and high level concern about copyright and plagiarism. Corall, (2014) outlined topic that could be covered by user education as accessing electronic databases and journals, finding high quality resources on the web, keeping up to date with new information, using bibliographic software pages, carrying out citation and advance databases for systematic review.

Usage of electronic information resources implies making use of the resources and services of a library. Use is an activity which measures the work of an item to a library or information system. Use is the single criterion which could be used to determine the reason for retaining or discarding a document in the collection of a library. It is essential in guiding the collection development efforts of a library. The use of a library can be obtained from the demand of its resources and services. Thus, whenever users have no demand for the resources and services of a library it means that the library does not have what they wanted. Usage is concerned with discovering, articulating, understanding, influencing, and when appropriate, the elimination or at least minimization of those obstacles between a user and his information goals. A library user may encounter problems due to certain things such as lack of knowledge in the use of the library. It is on this premise that this research work is carried out on the perceived influence of awareness and accessibility of University Students on usage of electronic information resources in Nasarawa State.

2.2 Statement of the problem

Information is generated in an exponential rate and the need to make them readily available, usability and accessible to all became an issue and in a bid to overcome this problem, brought about the quest for an alternative media for holding and propagating information resources. Several attempts were made until the emergence of information and communication technology (ICT) especially the Internet in the early 1990s, which brought about the needed change to cope with the ever increasing volume of information. With the Internet and other electronic information resources (EIRs) media such as CD ROM, databases, OPAC, information can be stored in one place and be made simultaneously available to all for usage. However, observations has shown that Universities students seem not to be utilizing these e-resources available to them, could it be that they are not aware of these EIRs and if they are aware why is it that the usage is hindered? It is based on this premise that this research work is carried out on the awareness and use by University Students, electronic information resources in Nasarawa State Nigeria.

2.3 Objective of the study

The purpose of the study is to investigate the awareness, and utilization of electronic resources by Students in Nasarawa State. The study seeks to:

1. Identify the available electronic information resources by university students in Federal University, Lafia and Nasarawa State University, Keffi.
2. Find out the extent to which students' awareness of electronic information resources influence their usage of the electronic information resources.
3. Find out the factors that hinder the students' awareness and use of electronic information resources by University students.

2.4 Research Questions

This study was guided by the following research questions;

1. What are the available electronic information resources by university students in Federal University, Lafia and Nasarawa State University, Keffi Nasarawa State?
2. To what extent does students' awareness of electronic information resources influence their usage of the electronic information resources by university students in Nasarawa State?
3. What are the factors militating against the awareness and use of electronic information resources by University students?

2.5 Statement of Hypotheses

Null hypotheses were formulated to guide the study and were tested at 0.05 level of significance

1. Awareness of Electronic information resource does not significantly influence students usage of Electronic information resources by universities students in Nasarawa State.
2. Accessibilities of Electronic information resource does not significantly influence students' usage of Electronic information resource by universities students in Nasarawa State.

2.6 Information Utilization Theory (IUT) By Havelock R.G. in1975

The theory of Information Utilization Theory was propounded by Havelock R.G. in 1975. The theory states that information utilization is a paradigm that moves information from availability to accessibility and finally to utilization level. Havelock examines the tasks of generation, dissemination and use of knowledge (information). He sees dissemination of information as the mode of moving knowledge/ information from one place to another. This means that knowledge already exists and that the components can be transmitted from one point to another. This Theory sees utilization as the action or what happens to knowledge (information) after it has reached its destination. Its utilization explains the state of how knowledge is received, interpreted or transformed and consumed when it gets to its destination.

Havelock (1975) configures the essential elements of the paradigm he used to explain the elements in a research-utilization process on two premises. The first is that the User Communities and the Research and Development Communities are two distinct problem solving systems. The second is that the two-way communication process between the two communities is essential starting point to the event of "research utilization".

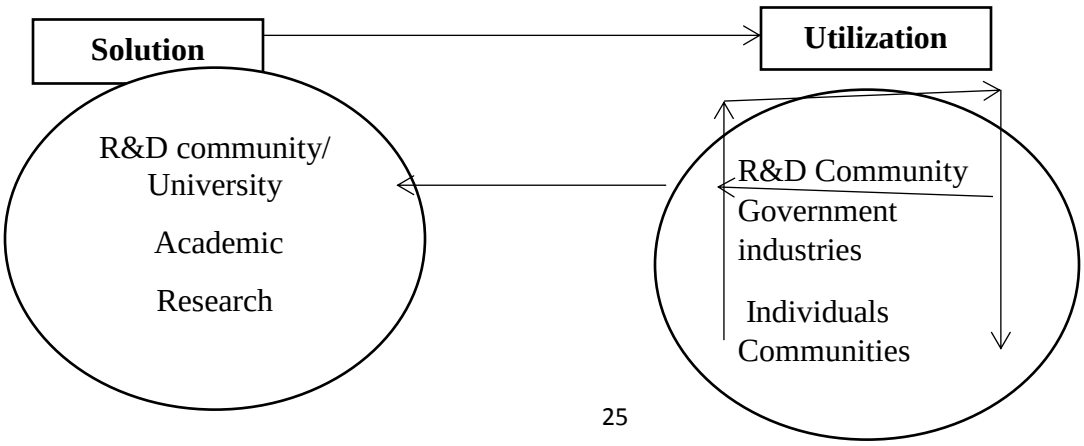

Figure 1: The Problem Solving Dialogue
Source: Havelock (1975) from knowledge to wisdom in information for action.

The relevance of the theory to this study in Figure 1 is that the community of research and development is the same as the users of information; however others like the government, industries, individuals and institutions all constitute the users of information. Students' need information for research output and career progression. They need to do research and advance the frontier of knowledge so they seek information to cover their areas of research. They need to determine the approach of obtaining answers to their problems through electronic information resources. Librarians get information through accessing the available electronic information resources and utilized such information for the purpose of research work, this theory state how information is moved from one place to another. Through research output students' can move information from one place to another. The researcher adopted this theory because of its relationship to the problem under investigation.

Concept of Awareness

Awareness can be seen as knowledge or perception of a situation, fact, consciousness, recognition, realization, grasp and acknowledgement concern about and well-informed interest or familiarity in a particular situation or development Akpojotor, (2016). Asemi and Riyahiniya, as cited by Sejane, (2017) observed that awareness of the existing library resources was crucial in influencing the usage of the resources and maintained that when a user is aware of resources, it would usually lead to a greater use of the resources. Majority of students were not aware of the online public access catalogue and e-resources provided through the library web pages Wijetunge, (2015).

Awareness as a state of consciousness and purpose Oragwam, (2014). Awareness as the condition of being aware and able to understand what is happening around one. Awareness is an attribute of action. Doing one thing while lacking head of other relevant occurrences over not two parallel line of active but a specific way of pursing a line of action, namely to do it heedfully, competently, mindfully, accountably. Awareness does not refer to some special category of mental state existing independently of action but to a person's being or becoming aware of something Chinedu, (2018). Awareness is an integrated aspect of practice and must be investigated. Awareness is referred to as a feature of practical action which is systematically accomplished within developing course of everyday activities (Heath, 2012). The author explains further that it is not the same as cognizance; awareness is an automatic response to one's environment, which one can direct when needed. Awareness is a social activity in that one takes cares from those around one which can influence his/her awareness and lead to a greater shared awareness. Awareness is achieved in collaboration with engagement in other human activities.

Awareness according to New Webster comprehensive dictionary defines awareness as a possessing knowledge, conscious, cognizant of something. To be aware means to have knowledge or idea of something, somebody, an event, a place or information that one needs. In this context, it means being aware of the electronic information resources that students can use to aid their studies and research. Awareness of electronic resources means users of the library have information and knowledge of e-resources been subscribed to. When users of a library have adequate information on what resources that is available in the library, they are encouraged to use them as the need arises. Creating awareness of the e-resources could be done in varieties of ways including: instructional services such as library orientation and training in the use of library skill and study guide, Current Awareness services, publications of library newsletters, pasting of data bases that could be used in accessing e-resources with password in bill boards, workshops seminars university websites.

2.7 Concept of Usage of Electronic information Resources

Electronic information has gradually become a major resource in every university library in recent years. The growth and diversity of electronic resources, especially e-journals, has led many to predict the extinction of the printed journal. It has been suggested that a new paradigm is sweeping scholarship (Harper, 2016).

In the global information communications technology (ICT)-dominated world, “place” is less important. The impact of moving from text-based to resource-based learning has involved heavier use of library materials and a demand for more and varied media sources (Kinengyere, 2017). This makes the provision and use of electronic information systems in university libraries a critical issue for those working in information and library services (Armstrong, 2011). The pace at which information resources are being produced and converted into electronic formats is greater today than in previous years (Armstrong, 2011). In today's information age it would seem that library users would not only be eager to take advantage of the convenience electronic are sources have to offer, but would be fully immersed in the new technologies (Elam, 2017).

Electronic information resources offer today's students new opportunities not available to previous generations. Reading an e-journal is not the same as reading a printed issue, many people now acknowledge that electronic documents offer users advanced features and novel forms of functionality beyond those possible in printed form. Electronic resources are invaluable research tools that complement the print-based resources in a traditional library. Their advantages include access to information that might be restricted to the user due to geographical location or finances, access to more current information, and provision of extensive links to additional resources or related content. The arguments for students using electronic resources are compelling. However, knowledge of computers and retrieval techniques is needed to search these resources effectively. It is therefore necessary to determine what computer skills students need to access library electronic information resources (Okello-Obura & Magara, 2018).

Students’ ability to find and retrieve information effectively is a transferable skill useful for their future lives as well as enabling the positive and successful use of electronic resources. The ability to explore the digital environment is a requirement for academic success today Tella, (2017). Students are increasingly expected to use electronic information resources at the university. In order to make use of the growing range of electronic resources, students must acquire and practice the skills necessary to exploit them. Skills learning is essential in a technology driven environment, and it can be enhanced through the use of innovative learning strategies.

2.8 Concept of Electronic Information Resources

In recent time, there has been the need of Electronic Information Resources EIRs in libraries to meet up with the objective of their parent institution. Electronic information resources are invaluable tools for study, learning and research (Togia & Tsigilis, 2019). For any library to thrive in this information age, the library irrespective of the size of its collection must embrace Information Communication Technology. However libraries are established to facilitate and supports research and teaching. The electronic resources are systems in which information is stored electronically and made accessible through electronic systems and computer networks.

These resources include OPAC, CD-ROMs, Online- Databases, E-journals E-books, Internet resources information repositories. Multiple accesses speed, richer in content, reuse, timeliness, anywhere access is some of the features of resources. The electronic documents can be stored, accessed, and delivered as and when required; therefore the services of libraries are not confined within the four walls but are integrated into local, regional, national, and international networks. It is common knowledge that virtually all scholarly and academic journals, electronic databases, online library catalogues, grey literature and other relevant scholarly materials in all fields of knowledge are now accessible on the internet. Information explosion via Internet connectivity has greatly increased the amount of electronic information resources available on the web. E-information resources have enhanced accessibility, increased usability, effectiveness and established new ways for information users in using information for more productivity in their endeavors.

Electronic information resources simply referred to as electronic resources or e-resources are information stored in electronic format in computer or computer related facilities (CDROMs, digital libraries or the Internet). Haridasan and Khan, (2019) defines electronic information resources as “resources in which information is stored electronically and which are accessible through electronic systems and networks”. Electronic resources are now used to supplement printed information sources in the university libraries.

Different types of electronic resources that are used in this study are: e-journals, e-books, online databases, electronic conference proceedings and CD-ROM databases (Swain, 2010, Parameshwar & Patil, 2019). Online databases that are commonly used by academic staff in Nigerian universities for their research are EBSCO HOST, AGORA, HINARI, MEDLINE, JSTOR and OARE. A number of these e-resources (online databases / digitized local journals) are accessible via the National Virtual Library which is run by National Universities Commission. Aina, Mutula and Tiamiyu, (2018) recorded that electronic resources are information Resources that are available in computer process able form the electronic environment presents a new and relatively unexplored area for such study. Some early effects of the increasing availability of electronic resources are already apparent. The emergence of electronic information resources has tremendously transformed information handling and management in Nigerian academic environments and University libraries in particular (Ani & Ahiauzu, 2018).

These dramatic changes include the way in which information is provided to the University communities. A number of electronic resources initiatives have been put in place to assist in the development training and use of electronic resources in a number of academic institutions (Egberongbe, 2011).The electronic resources are systems in which information is stored electronically and made accessible through electronic systems and computer networks. These resources include OPAC, CD-ROMs, Online- Databases, E-journals E-books, Internet resources. Multiple accesses speed, richer in content, reuse, timeliness, anywhere access is some of the features of e resources. Electronic resource as defined by AACR2, (2002) is any work encoded and made available for access through the use of a computer which includes electronic data available by: Remote access: (electronic resources) refers to the use of electronic resources via computer networks. Direct access (fixed media): (electronic resources) refers to the use of electronic resources via carriers (e.g., discs/disks, cassettes, cartridges) designed to be inserted into a computerized device or its auxiliary equipment. Accordingly Shuling, (2017), electronic information has gradually become a major resource in every university library. The emergence of electronic information resources, simply referred to as electronic resources, has tremendously transformed information handling and management in academic environments and in University libraries in particular. Libraries need to be vanguards for technology transfer from the developed world to the developing economies of Africa; to meet these expectations African university libraries must provide a link between local researchers, scholars and their counter parts in other parts of the world.

Electronic information resources are a wide range of products going from electronic periodicals to CD-ROMs, from mailing list to databases, all of them having a common feature of being used and sometime modified by a computer while the internet provides a broad range of information via search engines, subject gateways, subject directories and other web-based resources. When users of the library are informed of the available materials, it is expected that those resources should be well organized for easy accessibility. Some of the electronic resources required password and User ID for them to be accessible while some can be accessed without any restrictions. Electronic information resources provide access to information that might be restricted to the user because of distance. The emergence of electronic resources has cut the barrier to valuable information resources which until now were difficult to access especially by scholars in the developing nations of the world (Sabouri, 2010).

In Nigeria, the use of computer terminals in information searching is gradually gaining popularity and so the students need to be computer literate. Thus, many Nigerian university libraries are striving to be fully automated while some are still in the process of computerization. To derive maximum benefit from the increasingly electronic library use environment, the user of Nigerian university libraries need to be computer literate, (Emwanta & Nwalo, 2013). Electronic resources provide a number of benefits over print resources. These benefits include the fact that electronic resources are often faster to consult than print indexes especially when searching retrospectively, and they are straight forward when wishing to use combination of keywords. They open up the possibility of searching multiple files at a time. Electronic resources can be printed, searched and saved to be repeated or consulted at a later date. They are updated more often than printed resources. The major benefit of electronic resources in the university library besides ease of access to the needed information is that access can be done remotely by students, and academic staff in their offices/laboratories or at homes/ hostels without physical visit to the library. Thus, electronic resources promote efficiency in dissemination of information for research purposes in universities (Thanuskodi, 2012).

2.9 Challenges of Availability, Awareness and usability of Electronic Information Resources

Despite the fact that electronic resources have a lot of benefits, there are some hindrances to its effective use. Challenges of electronic information resources that hinges directly on Africa and Nigeria in particular includes according to Alabi, (2003) poor and inadequate telecommunication facilities, poor level of computer literacy among Nigerian higher education students and researchers (even among staff of the institutions), poor computer facilities, poor level of awareness of internet facilities and importance of information among Nigerians, ignorance of decision/ policy makers on the power of information technology for industries and economic development of a nation. In addition to information technology in Nigeria, namely (Nitel, MTNGlo, Airtel.) and Electric Distribution Commission (EDC) have always rendered epileptic services, which affect adversely the electronic service provision. The slow speed results in to wastage of time required to retrieve relevant information. Others may include lack of constant electricity supply and access to electronic resources.

Furthermore, a close look at the budget allocation for education in Nigeria, gives the picture of a poorly funded ministry. The effect Gbaje, (2017) affirms that higher institution of learning in Nigeria cannot cope with the fast growing trend of information communication and consequently the web, because they cannot acquire and install information and communication facilities adequately. Plum, (2010) & Shuling, (2017), identify some challenges faced by users in the utility and access of the e-resources which includes lack of awareness, lack of information literacy skills. Angello, (2010), maintains that other challenges include necessary skill to search databases, lack of time, the challenge of locating “good citable stuff”, inability to use effectively the library, and poor skills in information searching due to poor access to computer. Lack of information literacy skills among most of the researchers and this was found to be limiting their access and use of e-resources. These challenges hinder the students in the use and non-use of e-resources such as e-journals, databases, and e-books. So there is a need to develop and improve ICT and information literacy skills for utilizing the enormous benefits available in electronic formats.

Methodology

The study adopted a survey research design in which a group of people or items are studied by collecting and analyzing data. This design is most appropriate for this study which directly sought a target population of registered library user’s opinion by using questionnaire to gather information on the perceived influence of availability and awareness of university students on usage of electronic information resources. The study was conducted in Nasarawa State of Nigeria. The population for the study was 7233 registered library users from two (2) Universities in Nasarawa State from 2017/2018 academic session. The Population includes: Federal University Lafia (FULAFIA) with 2,871 registered library users and Nasarawa State University Keffi (NSUK) with 4, 362, registered library users. (Data obtained 2018). The sample size of this study is 379 drawn using Taro Yamane’s formula for sample size determination. Proportionate stratified random sampling technique was used to select the sample of respondents from the two Universities. Federal University Lafia with 150 and Nasarawa State University of Keffi 229 making a total of 379. The instrument for data collection for this study was a self-structured questionnaire with four responses mode (High Extent; Moderate Extent; Extent; Not Extent), and “F” contains (4) items with a response mode and scoring scale of (Strongly Agreed; Agreed; disagreed; Strongly Disagreed. The instrument was subjected to face and content validation by three experts, two from Library and Information Science and One expert from test and measurement, requesting to examine the clarity of expression used as well as the appropriateness of the language used in the instrument. Their comments and observations were therefore used to refine the instrument. In order to determine the reliability of the instrument, the researcher distributed thirty (30) copies of the instrument to thirty respondents of Benue State University, Makurdi that are not part of the main study for trial testing after approval of the instrument by the supervisors. Cronbach alpha method was used to determine internal consistency of the questionnaire items and a coefficient of 0.729 was obtained. With this reliability coefficient yielded, it was deem fit for the research to be conducted using the questionnaire designed for the data collection. The questionnaire were administered to the students of the two (2) Universities under study. The data for the study was collected by the researcher and research assistants through personal contact. To ensure high percentage return, the questionnaire was personally administered and collected directly on the spot by the researcher and two research assistants.

The data collected was analyzed using descriptive statistics of Percentage, Frequency Count Mean scores ($\overline{X}$) and Standard Deviation (SD) were used to answer the research questions raised. The average of the responses on a 4 point type scale was 2.50. Mean values ranging from 1.00 – 2.49 indicates low extent, mean values ranging from 2.50 –3.49 indicates moderate extent while mean values ranging from 3.50 – 4.00 indicates high extent. Percentage ranging from 50 and above indicates available while percentage ranging below 50 indicates not available. The hypotheses were tested using chi-square. Chi square was used to test the hypotheses since data that will be obtained are nominal data and it summarizes the discrepancies between the expected numbers of times each outcome occurs and the observed number of times each outcome occurs, by summing the square of the discrepancies, normalized by the expected numbers, over all the categories.

2.10 Result and Discussion

This chapter deals with the presentation and analysis of data obtained from responses. Therefore, the data analysis was based on the total number of questionnaire returned. As earlier noted sample population for the study were 379. Accordingly, 379 questionnaires were sent and 362 returned. Hence the percentage returned is 95.5% showing reasonable high percentage.

Research Question 1: What are the available electronic information resources in Federal University, Lafia and Nasarawa State University, Keffi?

Table 1: Responses on Available Electronic Information Resource in Federal University, Lafia and Nasarawa State University, Keffi

S/N	Services/ Facility	N	Available	%	Not Available	%	Decision
1	Internet Services	362	361	(99.7)	1	(0.3)	Available
2	E- journals	362	333	(92)	29	(8)	Available
3	E- books	362	326	(90.1)	36	(9.9)	Available
4	E- research Reports	362	300	(82.9)	62	(17.1)	Available
5	E- newspapers	362	293	(80.9)	69	(19.1)	Available
6	E- lecture notes	362	287	(79.3)	75	(20.7)	Available
7	E- projects	362	275	(76)	87	(24)	Available
8	CD ROM	362	272	(75.1)	90	(24.9)	Available
9	E- magazines	362	263	(72.7)	99	(27.3)	Available
10	Online Databases	362	261	(72.1)	101	(27.9)	Available
11	E- pre prints	362	257	(71)	105	(29)	Available

Source Field work 2018

Table 1 showed the available electronic information resources in universities in Nasarawa State. As shown in this table, respondents ranked Internet services and E-journals as the most available choice. From the findings, it can be deduced that there is availability of electronic information resources in universities in Nasarawa State.

Research Question 2: To what extent does students' awareness of electronic information resources influence their usage of the electronic information resources in university in Nasarawa State?

Table 2: Mean score and Standard Deviation of extent of students' awareness of electronic information resources influence their usage of electronic information resources in university in Nasarawa State.

S/N	Items	N	Mean	Std. Deviation	Decision
1	E-journals	362	3.42	0.77	Moderate Extent
2	E-books	362	3.41	0.90	Moderate Extent
3	E-research reports	362	3.31	0.76	Moderate Extent
4	CDROM	362	3.27	0.93	Moderate Extent
5	E-projects	362	3.27	0.95	Moderate Extent
6	E-newspapers	362	3.25	0.96	Moderate Extent
7	E-magazines	362	3.23	1.00	Moderate Extent
8	E-preprints	362	3.21	1.01	Moderate Extent
9	Online Databases	362	3.19	0.93	Moderate Extent
10	Internet Services	362	3.19	0.87	Moderate Extent
11	E-lecture notes	362	2.98	1.10	Moderate Extent
	Grand Mean	**362**	**3.25**	**0.93**	**Moderate Extent**

Source Field work 2018

Table 2: showed extent of students' awareness of electronic information resources influence their usage of electronic information resources by universities students in Nasarawa state. As shown in this table, respondents ranked E-journals and E-books as the most electronic information resources that influence their usage of electronic information resources. The grand mean and standard deviation are 3.25 and 0.93 respectively.

Research Question 3: What are the factors militating against the awareness and use of electronic information resources by University students in Nasarawa State?

Table 3: Mean score and Standard Deviation of factors militating against the awareness and accessibility to electronic information resources by University students in Nasarawa State.

S/N	Items	N	Mean	Std. Deviation	Decision
1	Lack of advanced searching skill	362	3.90	0.54	Agreed
2	Navigation problems	362	3.88	0.56	Agreed
3	Library staff are in difference	362	3.81	0.56	Agreed
4	Poor internet connectivity	362	3.72	0.45	Agreed
5	Technological constraint	362	3.69	0.58	Agreed
6	Lack of ICT skill	362	3.68	0.66	Agreed
7	Student poor orientation	362	3.67	0.74	Agreed
8	Frequent breakdown of system	362	3.47	0.73	Agreed
9	Lack of personal laptop and other electronic gadget	362	3.46	0.87	Agreed
10	Erratic powersupply	362	3.22	0.91	Agreed
11	Lack of awareness	362	3.06	1.12	Agreed
	Grand Mean	362	**3.50**	**0.76**	

Source Field work 2018

Table 3: showed factors militating against the awareness and accessibility to electronic information resources by University students in Nasarawa State. As shown in this table, respondents' ranked lack advanced searching skills and navigation problems as the most choice. The cluster mean and standard deviation are 3.50 and 0.76 respectively.

Test of Research Hypotheses
This is designed to test the hypotheses formulated to guide the study. The hypotheses is tested at 0.05 level of significance.

Hypotheses 1
Awareness of Electronic information resource does not significantly influence students' usage of Electronic information resources by universities students in Nasarawa State.

Table 4: Chi-square Analysis of Mean Ratings of the Students Responses on Awareness of Electronic Information Resource by Universities Students' in Nasarawa State.

	Df	X^2Cal	Sig	Alpha Level	Remark
Chi – square	30	302.21	.000	.05	Significant
Number of validCases		362			

P<.05

From table 4, the Chi-square calculated value of 302.21, degree of freedom df =30 and a sig (P-value=0.00) which is less than the alpha value (α=.05). Since P<.05, the result is significant, therefore the null hypothesis is rejected. This implied that awareness of electronic information resource significantly influence students' usage of electronic information resources by universities students in Nasarawa State.

Hypotheses 2
Accessibilities of Electronic information resource does not significantly influence students' usage of Electronic information resource by universities students in Nasarawa State.

Table 5: Chi-square Analysis of Mean Ratings of the Students Responses on Usability of Electronic Information Resource by Universities Students' in Nasarawa State.

	Df	X^2Cal	Sig	Alpha Level	Remark
Chi – square	30	441.5	.000	.05	Significant
Number of valid Cases		362			

P<.05

From table 8, the Chi-square calculated value of 441.5, degree of freedom df =30 and a sig (P-value=0.00) which is less than the alpha value (α=.05). Since P<.05, the result is significant, therefore the null hypothesis is rejected. This implied that accessibility of electronic information resource significantly influence students' usage of Electronic information resource by universities students in Nasarawa State.

2.11 Major Findings

1. There are several available electronic information resources such as E-books, E-journals, E-newspapers, E-magazines, E-preprints, CD ROM, E-projects, E-lecture notes, E-research reports, online databases and internet services in Nasarawa State libraries.
2. Students are aware of the available electronic information resources in Nasarawa state libraries. These include E-books, E-journals, E-newspapers, E-magazines, E-preprints, CD ROM, E-projects, E-lecture notes, E-research reports, online databases and internet services.
3. Students to a high extent are accessible to available electronic information resources in Nasarawa state.
4. Awareness of the available electronic information resources influences the usage of the resources in Nasarawa state.
5. There are several challenges militating against the awareness and accessibility of university students on usage of electronic information resources in Nasarawa state.

6. Awareness of electronic information resource significantly influence students' usage of Electronic information resources by universities students in Nasarawa State.

2.12 Discussion of Findings

The findings on research question 1 in table 1 revealed that there are several available electronic information resources such as E-books, E-journals, E-newspapers, E-magazines, E-preprints, CD ROM, E-projects, E-lecture notes, E-research reports, Online databases and internet services in Nasarawa State libraries.

The findings on research question 2 on table 2 revealed that Students are aware of the available electronic information resources in Nasarawa state libraries. These include E-books, E-journals, E-newspapers, E-magazines, E-preprints, CD ROM, E-projects, E-lecture notes, E-research reports, online databases and internet services. This agrees with Ezema (2015) who attested that students are aware of the available electronic information and disagrees with Aina (2014) who attested that majority of the respondents are not aware of the electronic information resources and this affect the access and use of electronic resources. It also agrees with Okiki (2012) who is of the opinion that the level of awareness of subscribed electronic information resources is quite low.

The findings on research question 3 on table 3 revealed that students to a high extent are accessible to available electronic information resources in Nasarawa state. This finding collaborates with Ezema (2015) who attested that students are accessible to available electronic information resources and disagrees with Aina (2014) who attested that since respondents are not aware of the electronic information resources, this affect the access and use of electronic resources.

The findings on research question 4 in table 4 revealed that awareness of the available electronic information resources influences the usage of the resources in Nasarawa state. This is in conformity with Okello-Obura & Mogara (2018) who attested that respondents are aware of the available electronic information resources and disagrees with Okiki (2012) who attested that the level of awareness of subscribed electronic information resources is quite low.

The findings on research question 5 on table 5 revealed that the extent of students' accessibility to electronic information resources influences their use of the resources in Nasarawa state. This is in conformity with Okello-Obura and Mogara (2018) who attested that the extent of students' accessibility to electronic information resources influences their use of the resources in Nasarawa state.

The findings on research question 6 in table 6 revealed that Lack of advanced searching skill, navigation problems, library staff are indifference, poor internet connectivity, technological constraint, lack of ICT skill, student poor orientation, frequent breakdown of system, lack of personal laptop and other electronic gadget, erratic power supply and lack of awareness as factors militating against the awareness and accessibility of university students on usage of electronic information resources in Nasarawa state. This is in line with Sejane (2017) who attested that challenges such as budget cuts, low internet bandwidth, lack of up-to-date Information Technology (IT) infrastructure, inadequate searching skills, shortage of staff and high cost of subscription fees posed many of the threats to access to and use of e-resources in the institutions libraries.

In order to determine if awareness of electronic information resource significantly influence students usage of Electronic information resources by universities students in Nasarawa State, the study reveals that awareness of electronic information resource significantly influence students usage of Electronic information resources by universities students in Nasarawa State. It was also observed that accessibilities of electronic information resource significantly influence students' usage of Electronic information resource by universities students in Nasarawa State.

2.13 Conclusion

Based on the results of the findings, it was concluded that availability, awareness and accessibility of electronic information resources significantly influence its usage by university students in Nasarawa State.

2.14 Recommendation

Based on the findings of the study, the following recommendations were made:

1. Computer room or ICT centers should be created in faculties and departments to ease congestion and make it easily accessible to students. This would no doubt enable the students to have wider access to more and current electronic information resources without restriction of space and time.
2. Universities libraries should give more education to users on the available electronic information resources. Current awareness services, selection dissemination of information on electronic information resources should be intensified by library staff to users of the libraries.
3. Alternative sources of power should be provided for equipment/ facilities that enable uninterrupted power supply to facilitate in order to enable students interrupted services.
4. Universities libraries should include ICT/web training in their curriculum to train student at all level on the relevant skill needed to access the web.

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CHAPTER THREE

RESOURCE PROCESSING SERVICES PROCESS AND ITS SUCCESS IN IMPROVING ACCESS TO INFORMATION COLLECTION IN THE FEDERAL UNIVERSITY LIBRARY, LAFIA

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RESOURCE PROCESSING SERVICES PROCESS AND ITS SUCCESS IN IMPROVING ACCESS TO INFORMATION COLLECTION IN THE FEDERAL UNIVERSITY LIBRARY, LAFIA

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Abstract

The study provides a brief definition of technical services in the field of librarianship and goes on to discuss what technical services involve in any given library structure, as well as the scope and frequency of operations performed by the technological services department at Kogi State Polytechnic Library. To reach the study's aims, the researchers aimed to learn about the technical services process and its effectiveness in improving access to library collections. The study used research survey method processes. Data was collected using a standardized questionnaire. Throughout the research process, frequency and basic percentages were used to collect, evaluate, and interpret the various data sets. The study's population is forty (40), and the sample size is forty, which means that all of the questionnaires supplied were filled out and returned. The findings revealed that there was a lack of funding to allow the polytechnic to perform its services in accordance with its desired needs. According to the findings, the library's aims should include providing the best possible services and maximizing the use of its resources. As a result, the research provided beneficial suggestions and recommendations. The research exercise aims to supply readers, scholars, and researchers with helpful and necessary information regarding technical services.

Key words: Libraries, Collection Development, Resource Processing Services, Classification, Cataloguing, Acquisition.

3.1 Introduction

Resource processing services have a wide range of applications, but for the purposes of this study, the definition will be limited to the functions of acquiring and processing library items for usage. Libraries are places where books and other materials are housed and maintained for use in research, teaching, and learning. According to Abaka (2007), libraries vary in the areas of specialization on which some of the items they gather are based. For example, academic institutions (universities) like Federal University Library Lafia utilize the Library of Congress Classification Scheme (LCC), whereas polytechnics, colleges of education, colleges of technology, schools of nursing, schools of advanced studies, and so on in Nigeria use DDC and UDC.

Technical services must be properly explained, as they encompass almost all of the procedures that take on behind the scenes in libraries. It explains some areas of library management and technical services, including categorization, cataloguing, and acquisition. The importance of technological services, notably at the Federal University Library Lafia Library, cannot be overstated, particularly in the area of circulation support. This paper seeks to define what technical services imply in any particular library structure, as well as the scope and frequency of operations performed by the technical services department at the Federal University Library in Lafia.

3.2 Resource Processing Services in Federal University Library Lafia

The Federal University Library Lafia, like other academic libraries, differs in different ways but serves a same purpose, which is to assist institutions in carrying out their objectives. It contributes to the accomplishment of their goal and supports the overall programme by acquiring information materials through purchase, gift and exchange contribution, and providing book material services as needed. Given the library's size, it provides technical services such as cataloguing, classification, acquisition, bindery, collection development, stamping, access, and serials management, among others.

3.3 Statement of the Problems

The study investigates technical services and how they promote access to their collection for clients of the Federal University Library Lafia, as well as how arrangements should be made to make future document retrieval easier and faster. Virtually every library recognizes the value of technical services, which is why asignificant amount of money is spent on them.

However, the provision of technological services and their activities in libraries is unsatisfactory due to a lack of competent personnel, funds, space, and an appropriate selection policy. As a result, the researchers set out to investigate and make recommendations on its availability in order to determine what is causing the current state of technological services in the library.

Federal University Library Lafia

Federal University Library Lafia was established in 2012 with the primary objective to support teaching and research programmes of the university. The Federal University Library Lafia has eighteen professional librarians, twenty one Para-professional, and two security staff. The library has: Customer Services Department (Readers Services Department/ Circulation Services Department), Resource Processing Department (Technical Services Department), Serial Information Sources and Services (Serial Services Department) and Reference Information Sources and Services Department (Reference Services Department).

3.4 Objectives of the Study

1. To examine the various resource processing services provided in Federal University Library Lafia
2. To find out how resource processing services is being organized in Federal University Library Lafia.
3. To find out the difficulties encountered by staff during resource processing services processes.
4. To know how resource processing services facilitate access to library materials.

3.5 Research Questions

1. What are the types of resource processing services provided by Federal University Library Lafia?
2. How is resource processing services organized in Federal University Library Lafia?
3. what are the difficulties encountered by staff during resource processing services processes?
4. How is resource processing service facilitating access to library materials?

The scope of resource processing services in this investigation is limited to the function of “acquiring of library materials, cataloguing, classification and processing functions hence the study is a brief summary of resource processing services.

3.6 Resource Processing Services

Resource processing services according to Rozenblum, & Bates, (2013) refer to a set of activities and systems used to manage, organize, and transform raw resources whether they are physical, digital, or human resources into valuable outputs or services. These services are crucial in various sectors, including healthcare, information technology, manufacturing, and supply chain management. Effective resource processing ensures the efficient utilization of resources, maximizes productivity, and helps organizations meet their goals.

In the context of Health Information Management or Healthcare Information Systems, resource processing services are especially relevant. They help manage the flow of health-related data and information through different stages, from collection and storage to processing, analysis, and distribution.

Below is an in-depth discussion of resource processing services in the context of healthcare information systems, focusing on the various types of services, their applications, challenges, and benefits.

Types of Resource Processing Services

a. Data Processing and Information Management

In healthcare, **data processing services** are responsible for transforming raw health data into structured and actionable information. This includes processing medical records, patient information, and diagnostic data.

- **Health Information Exchange (HIE)**: A key component of data processing services in healthcare, **HIE** allows healthcare providers to share patient data across different systems and institutions. This improves care coordination, reduces errors, and ensures that healthcare providers have timely access to complete patient records.
- **Electronic Health Records (EHRs)**: EHRs are digital versions of patients' medical histories, and their processing involves the collection, storage, and retrieval of patient information. EHR systems utilize resource processing services to ensure that data is accurate, complete, and accessible when needed.
- **Clinical Decision Support Systems (CDSS)**: These systems process patient data and provide actionable recommendations based on clinical guidelines. CDSS uses complex algorithms and patient information to support decision-making at the point of care.

b. Healthcare Resource Scheduling

In healthcare management, resource processing services also involve **scheduling** and **allocation** of resources like medical staff, equipment, and operating rooms. Effective scheduling systems ensure that healthcare providers can meet patient demand without overburdening staff or facilities.

- **Automated Scheduling Systems**: These tools process real-time data on patient appointments, healthcare staff availability, and equipment utilization to optimize scheduling and reduce wait times.

c. Supply Chain Management

In healthcare settings, managing supplies and medications is a critical aspect of resource processing. **Resource processing services** in supply chain management help ensure that medical supplies and drugs are available when needed while minimizing waste and costs.

- **Inventory Management Systems**: These systems process data related to stock levels, orders, and supply usage. They help healthcare facilities track medical supplies in real time and automatically reorder items when stock runs low.
- **Just-In-Time (JIT) Inventory**: JIT models help hospitals and healthcare systems ensure that supplies are available when needed without overstocking. This system processes demand data and adjusts supply orders accordingly.

d. Financial Resource Management

Resource processing services also include **financial management** services that track and allocate healthcare funds. These services are integral for budgeting, accounting, and insurance processing in healthcare organizations.

- **Revenue Cycle Management (RCM)**: In healthcare, RCM services process data related to billing, insurance claims, and payments. Effective RCM ensures that healthcare providers are paid on time and that there is minimal delay or denial of claims.

2. Key Benefits of Resource Processing Services

a. Efficiency and Productivity

Resource processing services streamline the allocation and utilization of resources, reducing the time and effort required for manual tasks. In healthcare, this can result in faster patient care, reduced waiting times, and improved staff productivity.

- **Automated Data Processing**: Automation of tasks like data entry, scheduling, and supply management reduces human error and speeds up operations. This allows healthcare providers to focus more on patient care and less on administrative duties.

b. Cost Savings

Effective processing of resources helps organizations optimize their resource usage and minimize waste, leading to **significant cost savings**. For instance, hospitals that implement efficient **inventory management** systems can reduce excess inventory and save money on supply purchases.

c. Improved Quality of Care

In healthcare, resource processing ensures that accurate, up-to-date information is readily available to providers, leading to better patient outcomes. **Clinical Decision Support Systems (CDSS)**, for example, can help providers make evidence-based decisions that improve the quality of care and patient safety.

- **Data Integration**: Integrating data from various sources (e.g., EHRs, diagnostic tests) allows for a comprehensive view of patient health, which supports more informed decision-making.

d. Scalability

Resource processing services in healthcare systems, such as **cloud-based solutions** for EHRs and scheduling, are scalable. As healthcare organizations grow or patient volumes increase, these systems can easily adapt to meet rising demand without compromising quality or efficiency.

3. Challenges in Resource Processing Services

a. Interoperability Issues

One of the major challenges in the healthcare sector is the **lack of interoperability** between different resource processing systems. For instance, EHR systems used by different hospitals or clinics may not be able to communicate seamlessly, leading to fragmented patient data.

- **Solution**: The development of standardized protocols and frameworks like **FHIR** (Fast Healthcare Interoperability Resources) is addressing these challenges, but interoperability remains a work in progress.

b. Data Privacy and Security Concerns

Healthcare systems process sensitive patient data, and ensuring the privacy and security of this information is a critical concern. Data breaches or unauthorized access can have serious consequences for patients and healthcare organizations.

- **Solution**: Implementing robust cybersecurity measures, such as encryption, multi-factor authentication, and adherence to privacy regulations like HIPAA (in the U.S.), is essential to mitigate these risks.

c. Resistance to Change

Healthcare professionals and organizations may resist adopting new resource processing systems due to concerns about **training**, **costs**, and **disruption** to existing workflows. Overcoming this resistance is crucial for successful implementation.

- **Solution**: Offering comprehensive training programs, providing incentives, and involving healthcare staff in the decision-making process can help ease the transition.

d. High Initial Costs

The upfront costs of implementing advanced resource processing services, such as **EHR systems**, **supply chain management software**, or **clinical decision support tools**, can be prohibitively high for some organizations, especially smaller practices or rural healthcare providers.

- **Solution**: Governments and private insurers may offer financial support or incentives to help offset these initial costs. **Cloud-based systems** may also reduce the need for expensive on-site infrastructure.

4. Future Trends in Resource Processing Services

Looking ahead, several trends are expected to shape the future of resource processing services, particularly in healthcare:

- **Artificial Intelligence (AI)**: AI and machine learning can enhance clinical decision-making, automate administrative tasks, and improve patient outcomes by analyzing large datasets and identifying patterns.
- **Blockchain**: Blockchain technology could offer enhanced security and interoperability for EHRs and supply chain management by providing tamper-proof records and facilitating secure data sharing.
- **Telemedicine and Remote Monitoring**: As telemedicine grows, the processing of data from remote patient monitoring devices will become increasingly important. These technologies will require sophisticated resource processing services to ensure timely and accurate data analysis.

Resource processing services are integral to the efficient operation of healthcare organizations, particularly in managing data, scheduling, supply chains, and financial resources. While these services offer significant benefits in terms of efficiency, cost savings, and quality of care, they also face challenges such as interoperability, data privacy concerns, and resistance to change. Continued innovation and investment in technologies such as AI, blockchain, and cloud computing hold the promise of further transforming resource processing in healthcare.

3.7 Resource Processing Services in Libraries

Federal University Library Lafia, like any other type of library, has the same basic purpose: to assist the parent institution in carrying out its objectives. The library contributes to the achievement of its goals and supports the overall program by acquiring information items through purchase, gift, and exchange, as well as making books, materials, and services available for use. There was an old belief that technical services were simply a portion of the whole library profession, thus they needed to be clearly identified. In many small/large libraries, there is no "Technical Services, Administration Unit," but rather separate departments such as acquisition, cataloguing, and serials. Given the size of the Federal University Library Lafia and the aim of given the scale of the Federal University Library Lafia and the goal of this study, resources processing and development services such as categorization, cataloging, collection development, stamping, binding, accessioning, and serials control are provided. The materials that arrive at the Federal University Library Lafia are first stamped and entered into the accessioning register to determine the total quantity of library collections by assigning an accession number to each title, and then sorted and catalogued.

According to Arthur (2005), library classification is the systematic organization of books and other resources on shelves by subject in the most beneficial way for individuals looking for a certain piece of information. Materials in the Federal University Library Lafia are physically arranged according to the Library of Congress Classification as well as the author and title catalogue; a classification number is stamped on

each completed card catalogue. The catalog is organized alphabetically in the card cabinet. The classification number on the card indicates where users may quickly find the book on the shelf.

3.8 Duties of Resources Development & Resource Processing Services Section

1. **Classification**
   The technical section's activity in categorization consists of conducting a preliminary assessment of the materials received from the acquisition section, assigning a call number to the volume, and checking the allocated call numbers to ensure that the contents are as accessible and usable as possible.

2. **Cataloging.**

   Cataloging according to OCLC. (2018) is the process of creating and maintaining bibliographic records for resources in a library or information center, enabling efficient access and retrieval by library users. Cataloging involves the identification, description, classification, and indexing of materials to provide accurate metadata. It is an essential component of library management and information science, playing a crucial role in organizing collections for ease of use.

In this discussion, we will explore the key aspects of cataloging, the standards used, its importance, and the challenges faced by catalogers, alongside references to relevant sources.

1. Definition and Purpose of Cataloging

Cataloging OCLC. (2018) refers to the systematic process of organizing resources within a library, archive, or information system by creating detailed bibliographic records. These records typically include information such as the title, author, publisher, subject, and physical location of the item. The purpose of cataloging is to:

- **Identify and Describe Resources**: Cataloging provides a comprehensive description of an item, ensuring that it can be identified and accessed by users.
- **Enable Information Retrieval**: It organizes resources in a way that makes it easy for library patrons to find and retrieve materials.
- **Facilitate Resource Discovery**: Cataloging supports search and discovery features by associating relevant metadata with each item in the catalog.

Effective cataloging enhances resource discoverability, aids in the management of collections, and supports research and scholarship.

2. Key Steps in Cataloging

Cataloging typically involves several key steps:

a. Identification

The first step in cataloging is identifying the resource to be cataloged. This involves gathering basic information such as the title, author, edition, and publisher. For physical items like books, this can include physical characteristics such as size, binding, and language.

b. Description

After identifying the resource, catalogers create a detailed description. This includes information about the material's contents, language, format, and other features that distinguish it from other works. Descriptive cataloging ensures that users can understand what a resource is about and determine whether it fits their research needs.

For example, for a book, the cataloging record will include:

- Title
- Author(s)
- Edition
- Publisher and publication date
- Physical description (e.g., page count, illustrations)
- Series or collection (if applicable)
- ISBN/ISSN (International Standard Book Number/Serial Number)

c. Classification and Subject Analysis

Classification is the process of organizing resources by subject, using an established system such as the Dewey Decimal Classification (DDC) or the Library of Congress Classification (LCC). Catalogers assign a classification number to each resource, which determines where it will be placed on the shelf.

Subject analysis involves determining the primary topics or themes of the resource, which are reflected in **subject headings** (controlled vocabulary used to describe the topic of the resource). These subject headings are typically drawn from established thesauri or subject heading lists, such as Library of Congress Subject Headings (LCSH).

d. Metadata Creation and Encoding

Catalogers encode the bibliographic information into a standardized format (e.g., MARC—Machine-Readable Cataloging) so that it can be stored, indexed, and retrieved by library systems. The MARC format is commonly used by many libraries, but newer systems may use RDF (Resource Description Framework) or Dublin Core standards for metadata encoding.

3. Cataloging Standards and Systems

Cataloging relies on several internationally recognized standards to ensure consistency and interoperability. These standards help catalogers produce high-quality, uniform bibliographic records that can be shared across institutions.

a. MARC (Machine-Readable Cataloging)

MARC is a standardized format used for encoding bibliographic and authority data in libraries. It was developed by the Library of Congress in the 1960s and is still widely used in libraries today, although newer formats such as RDF and BIBFRAME are gaining traction. MARC provides a structure for organizing and storing cataloging information that can be read and processed by library systems.

b. RDA (Resource Description and Access)

RDA is a newer standard that builds on older cataloging standards such as **AACR2 (Anglo-American Cataloguing Rules)**. RDA provides guidelines for cataloging a wide range of materials and has been widely adopted by libraries for its flexibility and adaptability to digital and multimedia resources. It is intended to help catalogers describe resources in a way that meets user needs across all types of content.

c. Dublin Core Metadata Initiative

The Dublin Core is a set of metadata elements designed to provide a simple way to describe resources, particularly for the digital environment. It includes elements like title, creator, subject, and date. While not as detailed as MARC or RDA, Dublin Core is used extensively in digital libraries, repositories, and archives.

d. Library of Congress Subject Headings (LCSH)

The LCSH is a standardized controlled vocabulary used to assign subject headings to library materials. It helps catalogers categorize and index items by their main topics, ensuring that library users can efficiently search for and retrieve resources on similar subjects.

4. Importance of Cataloging

a. Improved Access to Information

Cataloging is crucial for ensuring that library users can easily locate and access the resources they need. Well-organized catalogs allow users to find books, articles, or other resources by keyword, subject, author, or title.

b. Resource Discovery

Accurate cataloging helps users discover materials that they might not have specifically searched for. With proper subject headings and classification numbers, users can find related resources that are organized by topic or theme.

c. Preservation of Knowledge

Cataloging ensures that resources are documented and preserved for future generations. It is particularly important for rare books, archives, and historical materials, as cataloging helps maintain records that reflect the content and context of these items.

d. Facilitates Interlibrary Cooperation

Standardized cataloging systems, such as MARC and RDA, facilitate resource sharing between libraries. Libraries worldwide can exchange cataloging records, enhancing access to resources and promoting cooperation across institutions.

5. Challenges in Cataloging

a. Changing Nature of Library Resources

The increasing diversity of library resources, including digital and multimedia materials, has made cataloging more complex. Catalogers must now handle various types of content, such as e-books, audio-visual materials, and websites, which often require specialized knowledge and new cataloging techniques.

b. Metadata Quality and Consistency

The quality of metadata created during cataloging can vary, leading to issues with data consistency and accuracy. Inconsistent or poorly structured metadata may hinder effective searching and retrieval.

c. Adaptation to New Standards and Technologies

As cataloging standards evolve, catalogers must stay current with changes to systems such as MARC, RDA, and new initiatives like BIBFRAME. The transition to new formats and standards can be time-consuming and costly for libraries.

d. Resource Constraints

Cataloging can be resource-intensive, requiring time and expertise. Libraries, especially smaller institutions, may face challenges related to limited staffing or funding, which can impact the cataloging process and the quality of catalog records.

Cataloging plays a fundamental role in the management and accessibility of library resources. Through the use of standards like MARC, RDA, and Dublin Core, catalogers organize information and ensure that users can locate and discover materials efficiently. As libraries continue to adapt to new technologies and resource types, cataloging practices must evolve to meet these challenges. Despite the challenges, effective cataloging remains a cornerstone of library and information science, ensuring that resources are organized, preserved, and accessible for future generations.

6. **Bindery**

Bindery is the process of binding pages into a cover to create a book. According to Alhassan (2003), the technical section of bindery work includes checking call numbers, examining information, preparing tooling instructions, and transmitting the work. According to Alhassan (2016) consists of the following:

i. Verifying the call numbers and integrity of selected volumes for binding, including page accuracy.
ii. Preparing tooling instructions (bind slip).
iii. Submit volumes and slips to the binding section.

7. Accessioning

According to Bloomberg (2016), accessioning is a system of issuing a unique number to each item purchased for inventory control; also, it is a routine activity in which a number is assigned to each new item to identify it. For a long time, libraries kept accession records, which included the title, publisher, supplier date, and cost of each item. Libraries that do not retain accession records will regard all information about a new item in the shelve list to be missing. The Federal University Library Lafia staff will keep a record of each book added to the collection.

8. Serials Control

Keeping track of the periodical (magazines) in the library, according to Bloomberg M (2006) defines serials as any publication issued in successive parts at either regular intervals and as a rule intended to be continued for an extended period of time; it often represents a significant portion of a library's collection and also requires a large portion of the operating budget.

Serials, according to Abdulsalami et al. (2012), contain the most recent materials that researchers and students require. The polytechnic recognizes the importance of serial publication and has loaded its library with journals, magazines, and newspapers. Serial work is critical to the library and demands accuracy. Reading newspapers, news magazines, and various periodicals exposes one to what is going on in the globe. Serial work is one of the most fascinating fields of technical services due to the variations and flexibility that occur in the daily routine.

3. 9 Resources Processing Services Librarian

The Electronic Resources Librarian coordinates the selection, licensing, acquisition, and activation of electronic resources, as well as the receipt of physical resources, and manages related library systems to ensure that the institution's students and staff have access to the resources they require for teaching and learning. These materials, entails both print and non-print that are available in school libraries to meet curricular and personal information needs. Print products include books, magazines, newspapers, pamphlets, microfiche, and microfilm. Some of the responsibilities of an electronic resources librarian are:

- Support the full life cycle of electronic resources including trials, subscriptions, budgeting, activating/deactivating and troubleshooting.
- Daily operation of electronic resources, including but not limited to subscription databases and collections, OpenURL management, and discovery systems.
- Maintaining, troubleshooting and administering a variety of hosted environments or external websites and other digital systems and services through which patrons locate information, i.e. LibGuides.
- Analyzing and interpreting electronic resource usage statistics, such as counter 5 reports, turnaways, as well as viewing historical trends and anticipating future trends.
- Serving as the technical liaison between the library and numerous third party systems (i.e., database aggregators and other providers of electronic content) as well as the College's IT department.
- Monitor and administer the library's internal ticket queue system for reporting web-based, digital, and electronic issues and troubleshooting.
- Recommending, implementing, and supporting emerging technologies (i.e. apps, chat, etc.)
- Maintaining and updating the proxy server, ensuring resources are both discoverable and readily available from both on and off campus.
- Monitoring various listervs and other vendor communication channels that specifically report on electronic resources and other performance issues.
- Perform reference shifts as scheduled.
- Provide Information Literacy instruction (either classroom or one-on-one) as assigned.
- Other library-related duties as assigned e.g., liaison duties and committee work.

3.10 Supervision of works under the direction of the University Librarian

The resource librarian is also responsible for monitoring the resource development department and information needs, as well as offering professional resource development services by assisting patrons in locating and using various library items and technology. Under the guidance of the Head of Resource Development Librarian or Assistant Head of Resource Development. Librarians may be responsible for continuing resource development projects as well as staff oversight.

Examples of Duties

1. Directs and supervises the operations of the library resource processing and resource development services staff.
2. Makes assignments to staff, trains and evaluates staff.
3. Coordinates resource processing and resource development operations in the library services and functions.
4. Provides reference in cataloguing and reader's service in the library section.

5. Assists in preparing the annual budget, particularly as it relates to resource processing and resource development services and needs.
6. Reviews potential materials for acquisition and contributes to acquisition and collection development efforts.
7. Recommends the adoption of bibliographic maintenance standards and authorities in an automated environment, develops procedures for processing all library materials.
8. Represents the library on regional automation committees and serves as the library database manager and authority on automation issues.
9. Meets with members of the library and others in order to coordinate activities and exchange information.
10. Assists in drafting bibliographic maintenance and automation policies, as assigned.

3.11 Requirement of Resource Librarian includes: Knowledge, Skills, and Abilities

1. Good knowledge of the principles and practices of Library administration as applied to a major library service.
2. Good ability to make decisions in an environment of limited resources and competing claims.Considerable knowledge of the principles and practices of library functions.
3. Thorough knowledge of contemporary bibliographic-maintenance standards and practice, including the Anglo-American cataloging rules, Dewey decimal classification, Library of Congress subject headings, OCLC/MARC records, and library automation.
4. Thorough knowledge of resource processing tools and procedures.
5. Considerable ability to administer the bibliographic maintenance function and to supervise staff in resource processing and resource development operations.
6. Considerable ability in oral and written communication.
7. Considerable ability to establish and maintain effective working relationships with superiors, subordinates, associates, officials of other agencies and the general public.

3.12 Success Measurement in Academic Libraries

There has been a great deal of work done on establishing performance indicators in the areas of resource processing, resource development services, but much less research has been carried out in the resource processing services area. University management is now demanding a more efficient use of scarce resources, and this leads to an urgent requirement for new management methods such as performance measurement based on performance indicators for all areas of the library in which IFLA Guidelines for Performance Measurement in Academic Libraries 1988.

The main aim of libraries using IFLA guidelines, however, is to achieve library objectives in terms of users' needs by linking performance measurement with the library's mission and goals. According to the guidelines, a performance indicator is 'a quantified statement used to evaluate and compare the performance of a library in achieving its objectives'. The use of indicators is an efficient way of measuring the effect of the library's services on the user. The indicators should be made easy to use, reliable, valid and helpful in making decisions. Included in the list of performance indicators are some that relate to resources processing services, such as ways of measuring collection quality by checking the collection against bibliographies for the relevant subject area, or of checking catalogue quality by known item or subject searches, or testing the availability of items in the collection by the speed of acquisition and book

processing. Putting materials on the shelves without adequate records in the catalogue is not a way of providing quality service, although the statistics, the measurable part, might look quite impressive. Hoffman, (2013).

The IFLA Guidelines give a set of user-oriented indications that are solely applicable to academic libraries. The ISO standards include cost indicators, such as the cost per classified title, hence the two publications contribute in various ways to the development of performance indicators in academic libraries. Neither work gives many instances of resource processing services. ISO CD 11620, the International Standard for Library Performance Indicators (1992-1995).

According to Abdulsalami (2013), the objective of a performance indicator is to measure performance or progress toward a specific goal across time. The measures are locally based, which means they are developed organically in accordance with strategic aims and operational objectives. The SMART concept states that performance indicators should be specific, quantifiable, achievable, and realistic, as well as time-bound. Federal University Lafia (FUL) should also try to develop performance indicators. One that deals with resource processing and the development services department. The performance indicator is defined as "the proportion of the material sought by the user that is available in the library for use at the time of the search." In summary, if the user can find the resources, they are available.

Although this indicator focuses on user failure at the catalogue or on the shelves, it also considers acquisition failure (item sought but not possessed), the adequacy of multiple copy provision, and cataloguing/processing turnaround time. Surveys of material availability are based on work done by the Federal University Library. A recent Aslib publication provides a practical introduction to performance measurement and indicators, as well as some general recommendations on how to apply performance indicators. According to this guide, there are several operational performance indicators for processing services that may be used to monitor productivity and costs. During purchases, the library can assess the vendor's supply speed and accuracy, as well as the unit cost.

In acquisitions, the library can assess the vendor's timeliness and accuracy of supply, the unit cost of supply, and productivity in terms of items handled per relevant staff person. This analysis can be divided down by material type, such as monographs, video recordings, cassettes, and so on. The timeliness of supply (an efficacy measure) must include the time spent from acquisition to cataloguing, as well as the total processing time required before an item hits the shelves and is available to the user. (The International Standard on Library Performance Indicators, ISO CD 11620, 1992–1995).

Cataloguing and classifying activities that include the compilation of descriptive entries for new purchases can be measured in terms of throughput time, accuracy of service supplied (which is difficult to determine), timeliness of provision, and user failure rate at the catalogue or on the shelf. The unit cost of cataloguing can be calculated for copy or original cataloguing (should the Iibrary accept all copy, including low-level copy, without editing to reduce costs?) Thus the number of items categorized by each relevant member of staff can be calculated. Again, separate figures could be preserved by material type (for example, video recordings, which must be seen before categorizing) or language (transliteration or writing in characters slows down processing). Equivalent figures can be kept for the physical processing of materials.

Indicators for material processing, such as stamping, labeling, and binding preparation, might follow a similar pattern: throughput time, work accuracy, unit costs, and items processed per worker. Binding preparation time and charges may be added to this. The performance of collection development is measured separately for acquisitions and user services. In acquisitions, budget expenditures by subject area, the proportion of purchase requests satisfied, the average cost per item, and the unit cost of selection can all be studied. Assessing loans per item is simple with a computerized system, but assessing in-house use of material is significantly more challenging because many users return books to the shelf even when asked not to. Some of the data needed for performance measurement in resource processing services can be generated by computerized in-house systems, but much of it necessitates the creation of special forms to fill out, procedures for staff to follow, or questionnaires or interviews to solicit feedback from users. Library staff could conduct sampling operations on a regular basis, but users should not be required to fill out questionnaires too frequently.

Once the data has been collected, a thorough statistical analysis is required to make sense of it and apply the findings in a usable fashion. If it was discovered that some cataloguers catalogued one title per hour while others catalogued six titles per hour, was there any data available to explain why this was the case? Was one a person categorizing movie or French material, which would account for the disparity in throughput? Was one person not looking for the best source of copy? Was the person cataloging six titles per hour not doing any authority work or making several mistakes? Some of these throughput-related data pieces are highlighted in daily statistics, indicating that additional action is required to properly evaluate performance. Hoffman (2013).

However, determining the work's quality and correctness is quite difficult. Checking all of the work done by skilled cataloguers is too time-consuming to consider, and users desire to obtain their content as soon as possible, even if errors occur. However, spot quality inspections could be performed on a frequent basis. The end result of this measurement and evaluation should allow management to allocate staff resources in the most cost-effective and beneficial manner feasible in order to give the best service to users.

Methodology

The researchers utilized the case study research method. This is because its goal is to characterize the current development and determine whether or not it is accomplishing the purposes for which it was founded. This study attempts to investigate how resource processing services facilitate access to the collection of the Federal University Library Lafia. The instruments employed for the conduct of this study are questionnaires, and 22 Federal University Library staff were sampled using the questionnaire.

Data Analysis

Federal University Library Lafia, library workers provided the data for this study via a questionnaire. The obtained data was turned into frequency counts, tables, and percentages, which were utilized to describe the trend of specific phenomena as needed, so aiding comprehension of the study. The data for this study were gathered from the responses of the library personnel of the Federal University Library Lafia; of the twenty-two (22) copies of the questionnaire issued, all were returned fully filled, demonstrating a 100% response rate. The conclusions were reached based on the findings.

Table 1: What are resource processing services provided in Federal University Library Lafia?

Service	No of Responses	Percentages
Cataloguing	6	27.3%
Classification	4	18.2%
Binding and mending	0	0%
Stamping	6	27.3%
Accessioning	6	27.3%
Total	**22**	**100%**

According to table 1; six (6) respondents representing 27.3% believe that cataloguing is an available resource processing service in the library, while another 6 respondents (27.3%) believe that stamping and accessioning services are also available, and 4 respondents representing 18.2% believe that classification is one of the services provided by the Federal University Library.

Table 2: How are the resources processing services organized in Federal University Library Lafia?

Rating	Frequency	Percentages
Cataloguing Number	5	22.7%
Classification Number	4	18.2%
Subject Heading Determination	4	18.2%
Cutter number/Author 3 letter surname	3	13.6%

Author/Title Catalogue	**6**	**27.3%**
Total	**22**	**100%**

The table 2 above was created to answer questions about how Federal University's resources processing services are arranged. According to the research, 6 respondents (27.3%) believe Fulafia resources were structured using titles. Five respondents said the resources were also catalogued, while four respondents, or 18.2%, said the library provided classification and topic heading determination services. Three people (13.6%) reported that cutter number activities were carried out.

Table 3: What are the difficulties encountered by staff during resource processing services processes?

Respondents	Frequency	Percentages
Lack of processing materials	8	36.4%
Lack of internet connectivity for online processing	6	27.3%
Lack of Expertise	5	22.7%
Instability of cutter determination	3	13.6%
Total	**22**	**100%**

Table 3 outlines some of the issues encountered in the university library's resource processing area. Eight respondents (36.4%) report a lack of processing materials, whereas six respondents (27.3%) report a lack of internet connectivity for online resource processing. 5 respondents (22.7%) agreed that there was a lack of technical skills in manual cataloguing and classification. Three respondents were uncomfortable with utilizing the cutter number and, in some cases, three letters of the author's surname.

Table 4: How is the resource processing services facilitating access to library materials

Respondents	No of Response	Percentages
Classification numbers	3	13.6%
Titles of resources (materials)	7	31.8%
Authority of the title name	10	45.5%
Subject titles	2	9.1%
Total	**22**	**100%**

Table 4 demonstrates that 10 of the 22 personnel who replied to the above question, or 45.5%, reported that the authors of the title name were frequently used to facilitate quick retrieval of materials from the university library. 7 respondents, or 31.8%, stated that resource titles were used to promote access to library works, 3 respondents, or 13.6%, stated that classification numbers were used, and 2 respondents, or 9.1%, stated that subject titles were used.

Summary of the Study

The purpose of this research is to identify some of the actions carried out in the Federal University Lafia's resource processing services section/department and how they contribute to easier access to library collections. Some of the issues encountered at the university library's resource processing area, as well as suggestions for potential solutions. The surveys were administered using interviews and documentary/literature as data collection methods, and the study found that the library lacked appropriate staff to deliver efficient services to its patrons. This was due to the library's small staff of 22 professional librarians, the majority of whom are pursuing master's degrees at other higher education institutions. In the library, the reading tables and chairs were in short of sitting capacity this makes users not comfortably accommodated. There was inadequate of man power, in the resource processing section couple with inadequate processing resources and technical know-how hamper or bedevil the section.

Findings

The conclusions of the study are summarized as follows:

1. The resource processing section facilitates respondents' access to university library resources.
2. Resource processing helped restructure the university library's collections.
3. Resource processing services have improved users' access to information.
4. Processing services improve access by organizing library contents.

Conclusion

In this study, an effort has been made to highlight both the accomplishments and the problems discovered in the resource processing area. This study presented views on the importance of resource processing services in the Federal University Library Lafia and advocated for adequate measures to be taken to overcome some of the problems encountered by the resource processing section, particularly in terms of funding to facilitate quick activities and services in the university library.

Evaluating the degree of resource processing, resource development, and information services given by the library, it is vital to provide assistance to the library in order to help maximize the usage of the library and also helps in reaching the objectives of the library. The establishment of the library was aimed at providing highly specialized type of services to its users. However, this objective will be realized if the recommendations made in this research are strictly adhered to.

Recommendations

The researchers make the following recommendations for successful and efficient services based on their findings:

1. Realize library aims to optimize services and resources. It is consequently recommended that the library be provided with cash so that it can perform its services and meet its desired needs.
2. The Library of Congress classifications are used to classify information materials. Professionally qualified staff should be employed in the resource processing division to increase productivity.
3. To address the issue of distance, it is proposed to build departmental libraries across departments and faculties.
4. Emphasize the use of audio-visual media for teaching and preserving information. The importance of audio-visual media as a means of instructional aid and preservation of information should be provided and made available in library automation.

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CHAPTER FOUR

THE CHANGING INFORMATION NEEDS OF PATRONS AND THEIR IMPACT ON THE ACQUISITION OF INFORMATION RESOURCE DEVELOPMENT POLICY IN ACADEMIC LIBRARIES

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THE CHANGING INFORMATION NEEDS OF PATRONS AND THEIR IMPACT ON THE ACQUISITION OF INFORMATION RESOURCE DEVELOPMENT POLICY IN ACADEMIC LIBRARIES

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Abstract: This study examines the policy governing information resource acquisition in academic libraries in Nasarawa State. Five research questions were developed to help the study achieve its aims. The study used a survey research method, with data collected via a standardized questionnaire. The obtained instruments underwent statistical analysis using the descriptive approach. The respondents were asked the following questions about the policy's scope, implementation, and evaluation. According to the data, only three of the five academic libraries surveyed have a written information resource development policy. Furthermore, the findings demonstrated that the Information Resource Development Policy of the Academic Libraries in these libraries contains components of information resource development policy, the findings also demonstrated that the Academic Libraries' Information Resource Development Policy includes components of information resource development policy, which are fully covered in the development of their resources. However, the survey indicated that not all acquisition librarians are aware of the policy's establishment year and frequency of revision. It was also observed that the libraries' information resource development policy, which is written, is completely guided for resource development, and that changing patron information needs have had an impact on the policy's implementation. The authors urge that a

standard, stated, and functional Information Resource Development Policy be implemented to assist the library in the choosing acquisition and management of information resource in order to meet the aims and objectives of the libraries and institutions at large.

Keywords: Academic Libraries, Information Resource, Information Resource Development, Information Resource Development Policy.

4.1 Introduction

Library according to Abdulsalami (2013) is a storehouse of collection of books, journal, educational and historical documents including electronic developments and electronic equipment, such as computer internet and other audio visual materials arrange in a systematic order for easy retrieval. Information resources refer to range of books and non-book materials in the library for the clientele use, such as microphones, tapes, computer, diaries and internet.

The library is the nerve center of academic activities in universities and is a bank of knowledge with varied and useful information carried in different kinds of material, each of which has its unique way of handling. The academic library is an important agent in the pursuit of academic excellence in higher institution. Its main goal is to support the objectives of the host institution which has to do with learning, teaching, research and administration. However, these academic libraries in universities are also regarded as research libraries because among their objectives are the provision of materials in support of postgraduate, faculty, external and collaborative researches. This shows that libraries are very important in institutions of higher learning because they assist the institutions to achieve their aims and objectives, by providing information resources to aid clientele satisfaction. How well the institution's library has been supportive depend on, the institutional library provision of essential information resources.

A deficient collection that is built on uninformed decision can have adverse effects on the academic library and subsequently in attainment of the goals of the parent institution. Therefore, every academic library requires a workable information resource development policy to guide its decision on resource development. The academic library is charged with the responsibility of ensuring that academic performance through collection, building, maintenance access and use timely information. Some of the roles of academic libraries are:

- Maintenance of adequate information resources such as books, monographic and serials etc.
- National and international library cooperation, lending and resource sharing.
- Reliable reprographic and document delivery services;
- Well trained and dedicated staff;
- Display and exhibition of reference stock.

Therefore, for academic libraries to achieve its optimum goal, it must stock adequate and relevant collections. Such collections include amongst others books, manuscripts, serials, government publications, pamphlets, catalogue, reports, recordings, microfilms, microfiche etc. implying that it is only with adequate library collection policy that academic libraries could reach the academic goals of their parent institutions. Abdulsalami *et al.* (2014).

4.2 Information Sources

Information source include data and the processes used to convert this into useful information, the equipment and technology required to use this information and the people involved in making best use of the information. Examples of these resources include computers, computer networks, electronic files and data, people and printed materials and other information bearing media. Information resources, therefore, include everything that is used in providing the required information service to the client. Information resources are necessary because, for libraries to be able to carry out their functions effectively, they must develop their collections to cut across all disciplines and satisfy the information needs of their users. This is because the place of information resources in the library can never be over emphasized. This means that

libraries need to do all that it can to ensure the acquisition of the relevant resources required by the library users.

4.3 Information Resources Development

Information resource development is another name for collection development which can be used synonymously. Information resource development means the acquisition of relevant titles to the various sections of the library through the process of selection and acquisition of information resources; it requires constant examination and evaluation of information resources as well as constant study of patrons' needs and changes in the community to serve. Information resource development encompasses other library operations ranging from the selection of individual titles for purchase to the withdrawal of expendable materials.

Therefore, information resource development according to Abdulsalami *et al.* (2014) is a process deliberately and consciously put in place for the continuous identification, selection, acquisition and management of information resources, taking into consideration the information needs of its users. However, whatever the relevance of information resources and the commitment of the library to developing the library's collection, it is not guaranteeing that any library can boost of the financial muscle enough to build all the required resources needed to meet the users' needs. It is in the light of this that it becomes necessary for the library to ensure that only resources that are truly required and which will meet the information need of its clients are acquired and the best way to achieving these effectively in a sustainable manner is by having a defined policy for the development of these collections.

4.4 Collection Resource Development Policy

This can be considered as a statement of intent or a commitment. Policy as a living document can be reviewed and revised regularly to keep it current and meaningful. In essence, policy is a guideline, rules and regulation on how things are to be done to achieve set aims and objectives. In the context of library operations, information resource development policy is therefore a written statement that serves as a guiding principle in building a balanced collection for any standard library and information center. The policy must therefore be very clear, purposive and contain the overall plan of activities for the development of information resources.

The importance of information resource development policy cannot be overemphasized. No matter what, an academic library should have, an information resource development policy, is a policy that expanded version of the mission or purpose of the library. Library policy provides reference point for material selection or rejection by following the guide lines established in the policy, a library can make more consistent and informed decisions about the collection and provide continuity during hard times and can also be used to evaluate and measure the performance of a library and that of the staff performance.

Preparation of information resource development policy involves certain processes. According to Arizona State Library, the collection development policy is a major project when preparing and so can be time consuming and requires a lot of consultation with board members, staffs and patrons. The processes involve establishing the procedure, gathering of relevant data, putting the policy in a written form and getting the policy approved. It also includes utilization of the policy and revision. Apart from the process involved in the preparation of the policy, it also have some components which includes the practical elements of the collection, its development, description of formats and special collection, description and goals for nonfiction classified collection, policy review and record of adoption (Abdulsalami, 2013).

4.5 Statement of the Problem

The main purpose of an information resource development policy is to establish guidelines for the planned development of a balanced quality selection of institutional materials, a backup guide on how selection and acquisition of information resources materials is to be made, in other words it's a selection policy made flexible to respond to institutional library selection policy in line with range of its objectives. Information

resource development policy ensures consistency among members, developing policy statement to respond to selection and acquisition criteria in the areas of the most challenging and frustrating aspect of librarianship. Available researches such as (Olanlokun and Adekanye, 2005) have shown that Nigerian university libraries are grossly underfunded and that the little resources made available is not enough to meet all the financial requirements of the academic libraries which include both human and material resources let alone providing all the required information resources that will meet the needs of all the departments and faculties. Since it is difficult or almost impossible to curtail this problem of inadequate funds to meet all the required collection needs of the libraries, it is imperative for the libraries to be guided in their resources development in order to utilize efficiently the little resources available to them in meeting the needs of their users.

Information resource development policy is a guiding principle on how selection and acquisition of institutional materials is to be made taking cognizance of priority areas in a backward economy and ensuring quality service delivery in the library. Base on investigation most academic libraries were not operating along that line which indicated inadequacies in the selection and collection of the libraries materials which are rarely used resources, meaning that the libraries may not have been using policies in their information resource development practices taken cognizance of the dwindling funding of education in Nigeria. It is in this regard that this research intends to find out the Implementation of Information Resource Development Policy for Information Resource Development in Academic Libraries in Nasarawa State.

4.6. Research Questions

1. Are there written Information Resource Development Policy Available in Academic Libraries in Nasarawa State.
2. What are the level of Awareness of Information Resource Development Policy by Staff of Academic Libraries in Nasarawa State
3. What are the Criteria for Evaluation of Information Resource Development policy in Academic Libraries?
4. What are the Challenges Encounters in Information Resource Development Policy need of Patrons in the Implementation?

4.7 Objectives of the Study

1. To ascertain the written Information Resource Development Policy Availability in Academic Libraries in Nasarawa State.
2. To determine the extent of the Awareness of Information Resource Development Policy
3. To determine the Criteria for Evaluation of Information Resource Development policy in Academic Libraries.
4. To examine the Challenges Encounters in Information Resource Development Policy need of Patrons in the Implementation?

4.8 Concept of Information Resources

The concept of **information resources** refers to the various types of information, data, and knowledge that an organization or society collects, processes, stores, manages, and disseminates. Information resources include not only digital data, such as databases, documents, and records, but also the systems, tools, and people responsible for creating, organizing, and using that information. In the digital age, information resources have become a critical asset for decision-making, innovation, and competitive advantage. The effective management of these resources is essential to ensure their quality, accessibility, security, and alignment with organizational goals.

Key Aspects of Information Resources

1. **Types of Information Resources**: Information resources can be broadly categorized into several types:
    - **Data**: Raw facts and figures that need to be processed or interpreted to have meaning.
    - **Information**: Processed data that is meaningful and useful for decision-making or analysis.
    - **Knowledge**: Information that has been internalized and can be applied in decision-making, often enhanced through experience and expertise.
    - **Digital Content**: Includes documents, images, videos, and other media stored in digital formats.
    - **Information Systems and Technologies**: Tools and platforms that manage and facilitate access to information, such as databases, cloud storage, and enterprise resource planning (ERP) systems (Buckland, 2023).
2. **The Value of Information Resources**: Information is a key resource in the knowledge economy, and its value is continuously increasing. Information resources can be used for a variety of purposes, from improving business operations and enhancing customer service to driving innovation and research (Choo & Auster, 2022). The management of these resources is critical, as information becomes a major source of competitive advantage. In this context, information management refers to the policies, strategies, and processes that help organizations acquire, organize, store, and protect information resources.
3. **Management of Information Resources**: The management of information resources involves various practices, including:
    - **Data Governance**: Ensuring data accuracy, consistency, and accessibility while maintaining compliance with legal and regulatory requirements.
    - **Information Retrieval**: Efficiently retrieving data and information from vast collections, often using sophisticated search algorithms or artificial intelligence (AI)-powered tools.
    - **Knowledge Management**: Organizing and distributing knowledge throughout an organization to ensure that employees can access the right information at the right time (Chavez & Ali, 2024).
    - **Information Security and Privacy**: Protecting sensitive information from unauthorized access, ensuring data privacy, and preventing cyberattacks (Zhou et al., 2023).
4. **Emerging Trends in Information Resources**: The field of information resources is evolving due to technological advancements. Key trends include:
    - **Big Data**: The explosive growth of data from various sources such as IoT devices, social media, and sensors is reshaping how information resources are managed (Smith & Johnson, 2023).
    - **Artificial Intelligence and Machine Learning**: AI technologies are being increasingly used to enhance data processing, automate information management tasks, and support decision-making (Parker & Ng, 2023).
    - **Cloud Computing**: The widespread use of cloud storage and computing services allows organizations to scale their information resources more flexibly and efficiently (Jones & Taylor, 2022).
    - **Blockchain**: This technology is being explored for securing transactions and ensuring the integrity of digital information resources (Greenwood & Stuart, 2021).
5. **Ethical and Legal Considerations**: Managing information resources also raises important ethical and legal questions, particularly in areas such as data privacy, intellectual property, and the ethical use of data. The General Data Protection Regulation (GDPR) in the European Union, for instance, has set strict guidelines on how personal data should be handled, affecting organizations worldwide (Greenwood & Stuart, 2021). Ethical concerns are also being raised about the use of AI in information management, particularly regarding bias and fairness in decision-making (Jones & Taylor, 2022).
6. **The Role of Human Capital**: Information resources are not just about technology; human expertise plays a central role in managing and utilizing them effectively. Information professionals, including data scientists, knowledge managers, and IT staff, are essential to ensuring that information resources are used to their full potential. The effective training and development of these

professionals are crucial to maintaining the quality and relevance of information resources (Buckland, 2023).

Recent Literature on Information Resources

Recent research has highlighted the expanding scope of information resources in modern organizations. Choo and Auster (2022) emphasize the need for organizations to develop a comprehensive strategy for managing both the technical and human aspects of information resources. Their work suggests that organizations must leverage new technologies, such as AI and machine learning, to enhance information retrieval and analysis, but must also address ethical issues associated with data usage.

Moreover, the growth of big data and its potential for decision-making has been explored by Smith and Johnson (2023), who argue that organizations need to integrate big data management practices into their information resource policies to stay competitive. In the realm of cloud computing, Jones and Taylor (2022) highlight the benefits of flexible and scalable storage solutions for managing vast amounts of data but also caution against potential security risks.

The ethical implications of information resource management are discussed by Greenwood and Stuart (2021), particularly in light of the GDPR and other data protection laws. These laws have shaped how organizations approach data privacy, with implications for information management policies across industries.

The concept of information resources is broad and multifaceted, encompassing everything from raw data to advanced knowledge systems. As the digital transformation accelerates, the effective management of these resources becomes increasingly complex. Organizations must adopt robust strategies to ensure the quality, security, and accessibility of their information, while also addressing the ethical and legal challenges that come with the growing use of data. As the landscape continues to evolve, the integration of new technologies and the development of comprehensive information governance frameworks will be essential for leveraging information resources as a strategic asset.

4.9 The Development of Information Resource Policy

The development of information resource policy has become an increasingly crucial aspect of organizational governance, especially in the digital age where information plays a central role in decision-making, innovation, and compliance. These policies define how information is collected, stored, accessed, shared, and protected, and they aim to establish clear guidelines for managing the lifecycle of information resources across various domains, from government to private enterprises.

Key Components in the Development of Information Resource Policy

1. **Definition of Information Resources**: Information resources encompass data, documents, systems, and any knowledge generated or used within an organization. The development of a robust information resource policy starts by clearly defining these resources and categorizing them according to their relevance, sensitivity, and value to the organization. This step is essential for determining how to manage access and security (Kurtz, 2022).
2. **Strategic Planning and Alignment**: A successful information resource policy must be aligned with the organization's strategic goals. This involves planning for how information will support business processes, enhance decision-making, and contribute to innovation. Organizations are increasingly incorporating information governance strategies that align with their overall business strategies, ensuring that information is an asset that can be leveraged effectively (Smith & Johnson, 2023).
3. **Legal and Ethical Considerations**: Legal and ethical frameworks form the backbone of information resource policies. Laws and regulations regarding data privacy, intellectual property, and cybersecurity must be incorporated into the policy development process. For example, the introduction of GDPR in the European Union has significantly influenced how organizations

worldwide develop policies related to personal data (Greenwood & Stuart, 2021). Ethical considerations also include the responsible use of data, ensuring that policies address issues such as bias, transparency, and fairness in the use of artificial intelligence (AI) and machine learning algorithms.

4. **Access, Sharing, and Privacy**: Policies must address who has access to which information and under what conditions. This includes setting rules for data sharing, determining public access levels, and ensuring that sensitive or classified information is appropriately protected. Many organizations are moving toward more open data policies, especially in sectors like healthcare and government, to promote transparency and collaboration. At the same time, privacy concerns have led to more stringent access controls for personal and confidential data (Jones & Taylor, 2022).
5. **Information Security**: The increasing frequency and sophistication of cyberattacks have highlighted the need for strong information security policies. Data breaches can have devastating financial and reputational consequences, and therefore, organizations must ensure their policies address how to prevent, detect, and respond to security incidents. In this context, policies must cover everything from data encryption to employee training on security best practices (Zhou et al., 2023).
6. **Technology and Infrastructure**: As organizations adopt new technologies such as cloud computing, artificial intelligence, and big data analytics, their information resource policies need to evolve. These emerging technologies create new challenges for managing and safeguarding information. Policy frameworks must ensure that infrastructure is scalable, secure, and adaptable to accommodate future advancements (Parker & Ng, 2023).
7. **Compliance and Auditing**: An effective information resource policy must include mechanisms for ongoing monitoring and compliance. This is essential for identifying gaps or vulnerabilities in the system and for ensuring that the organization adheres to relevant legal and regulatory requirements. Many organizations conduct regular audits and assessments to evaluate whether their information resource policies are being followed and to identify areas for improvement (Wong & Kim, 2022).
8. **Evaluation and Continuous Improvement**: Finally, information resource policies should be subject to periodic review and revision. The rapid pace of technological change, shifts in regulatory landscapes, and evolving business needs make it essential for organizations to continuously update their policies. Feedback loops from stakeholders and lessons learned from past issues should inform the development of more resilient and effective information management strategies (Chavez & Ali, 2024).

Recent Literature and Insights

The last few years have seen an increase in the importance of developing comprehensive and flexible information resource policies. Scholars and practitioners alike have highlighted the need for organizations to take a more holistic and strategic approach to information management. For instance, Smith and Johnson (2023) discuss how information governance strategies must evolve in response to global regulatory shifts and technological advancements. Similarly, Greenwood and Stuart (2021) explore how legal frameworks, such as GDPR, are driving policy development in sectors like healthcare, where data privacy and security are paramount.

Moreover, the integration of AI and machine learning into information management practices has introduced new ethical challenges, with Jones and Taylor (2022) emphasizing the importance of developing policies that ensure fairness and transparency in data usage. In the context of cybersecurity, Zhou et al. (2023) argue that organizations must adopt proactive security policies that go beyond compliance and create a culture of continuous vigilance and risk management.

The development of information resource policies is a dynamic process that requires ongoing adaptation to technological advancements, legal frameworks, and organizational goals. By addressing key issues such as access control, information security, and ethical considerations, organizations can create a policy framework that not only protects valuable data but also fosters a culture of innovation and collaboration. As

the digital landscape continues to evolve, organizations must remain agile, continuously updating their policies to address emerging challenges and opportunities in information management.

4.10. Content of Information Resource Development Policy

Information policy is a law that is made to regulate the policies that encourage, discourage, or regulate the creation, use, storage, access, and the communication and dissemination of information. It thus encompasses any other decision-making practice with organization or society-wide constitutive efforts that involve the flow of information and how it is processed. In the development of information resources, a policy is needed to cover certain areas. With regards to this, certain elements that should be covered in a written policy and these elements are: introduction, mission and vision statement that is the purpose of the library, clients and users of the library, library resources, evaluation of replacements, gifts to the library, retention, selection and storage, cooperative resources development agreements and so also the future goals of the library that is where the library sees itself in 5 or 10 years.

Carter (2017), however summarized the above into three elements which are: general overview, which is the introduction and general resources; detailed analysis of subject resources; and miscellaneous sections. In line with this, six elements are identified which are: philosophy, needs, assessments, goals and objectives, implementation, administrative control and evaluation. To this effect, University of Chicago Library Information Resource Development Policy outlined selection, acquisition, donations and permanent loan, duplication, retention and disposal as the areas of coverage of information resource development policy. From the above definitions of what a resource development policy should cover, the definition of Carter, Cassell, Taminuo are more elaborative, but Aina and University of Chicago library summarized theirs, even though they did not include evaluation as content.

Initially resources need to be reviewed and evaluated for selection from a content perspective against the same policies, guidelines and criteria that apply to print resources. Typically such criteria might state that the resource should:

- Support the main research aims and goals of the organization.
- Complement or add depth or breadth to the existing collection supported by subject profiles.
- Be of a certain quality, e.g., peer reviewed, or have a reputable producer.
- Support the requirements of the/a key audience.
- Generate an acceptable level of use.

Once the main selections criteria have been met, then a number of additional content criteria, unique to resources, need to be considered. These criteria are particularly important in helping to determine the preferred format in which to acquire an item where there is both a print and electronic equivalent. These include the consistency of the electronic publication with any print equivalent, the currency of the online content and frequency of updates, the availability of back issues, archiving, and the added value of the e-resource over other formats, and pricing.

4.11 Implementation of Information Resource Development Policy in Academic Libraries

Resources development is very essential in libraries because resources have to be developed before they can be made available to users. According to Olaojo and Akewukekere (2016), resource development policy establishes ground rules for planning, budgeting, selecting and acquiring library resources. Information resource development policy provides a frame work for coordinated resource development programme throughout the university libraries. In addition, these policies help the libraries serve the academic community.

Whenever they want to acquire resource materials for the library, they ask each department to submit their request and some cases the University management do acquire materials for the library which is affecting

their information resource development because some resources are not relevant and there is usually duplicate. Information needs to be well designed in other to be efficiently and effectively managed. Information resource development policy is regarded as the library constitution. It defines the library's goal in terms of its information resource (resources). This policy provides guideline in building balanced resources, choosing items for inclusion or exclusion, and serve as tool for library staff to provide efficient and effective library service to its diverse users.

4.12. Evaluation of Information Resource Development Policy

It is natural for human beings to evaluate and develop things, around them especially when it comes to selection of information resources. Librarians indulge in this practice in other to measure up to their expectation and to serve their patrons well. They have the need to periodically measure the resources and services of their library as a way of ensuring that they are meeting the set objectives of the library. Library evaluation began with the evaluation of retrieval systems in libraries, with parameters based on answerable questions revolving around recall and precision ratios of retrieval system. The quest to evaluate and develop library resources and services in recent times has led to the design of information resources development policy. Consequently, libraries, including faculty's libraries, have been faced with challenges of justifying their contributions to the achievement of their parent organizations' goals. Evaluation and development of information resources is carried out to justify and quantify benefits of research library resources and services to users' information utilization for research.

Academic libraries need to evaluate their policy to determine if the policy being implemented meets the objectives of the academic institution. To evaluating a policy, includes: Effectiveness, efficiency, flexibility, institutional constraints and community acceptance.

The researchers are of the opinion that, academic libraries can adopt these criteria in the evaluation of their policy. Thus, improved efficiency is associated with cost saving to library in terms of improvement in quality information resources. For example increase in the purchase of hardcover book to paper cover and the purchase of electronic resources. An important consideration in assessing policy instruments is the issues of equity or fairness. Equity has to do with the distribution of the cost and benefits among different information resources, while an institutional constraint looks at how policy instrument can fit in with the existing or proposed legislation. There must also be necessary administrative support to make policies work. For certain types of policies, difficulties may arise with respect to coordination, monitoring and evaluation functions. The success of a policy critically depends on the degree to which the community accepts it. Often, this depends on the extent to which the community understands how the policy works and the extent to which the objectives that the policy is trying to achieve. Information resource development policies need to be updated regularly for planning in other to evaluation the resources of the library.

Information resource development policies are important and have been one of the tools for resources development in which libraries define resources parameters relevant to the clientele needs for curriculum and research. However, Portland University Information Resource Development Policy (2019), states that an academic library's reputation is no longer primarily base on the quantity and number of volumes held but rather on quality of the resources along with access capabilities. Information resource development policy should not be static. It should be frequently reviewed and changed to reflect changes in the library's goal and in the resources itself.

4.13. Changing Information Needs of Patrons

As the community changes, the library will need to reassess and adapts its collection to reflect new and differing areas of interest and concern. Information Resource Development Policy is a written policy designated to periodically evaluated and review policy to provide guide for any implementing changes that may arise in the need for new collection. It is obvious that information resource development is necessary to identify the needs of the user rather than build abstract collection. University of Chicago Library Collection Development Policy (2013). The present era is called information era. Information has become the most important element for progress in society. It is to this effect that Kadil and Kumar (2013) stresses that a

thorough understanding of users information needs and seeking behavior is fundamental to the provision of successful information services.

According to Tahir and Mahmood (2018) for academic libraries to adequately address the changing information needs of its students, they need to know about the information searching, obtaining and use. However, Nicholas and Herman (2019) are of the opinion that building collections which fails to satisfy the information needs of users would be a futile exercise. For the purpose of developing information resources development policy, standard and guideline need to be followed, it is necessary to study the primary users before embarking on collection and to ascertain which information will routinely sought the collection on a particular topic. From the literatures reviewed above, the changing information needs of patrons will have an effect on the policy because the quest for information is not static, the information needs of users changes especially in this modern era of technology which has resulted to information explosion. The information needs of patrons may tend to be shifting from print to electronic resources and so libraries need to adjust their policies to meet the changing information needs of their patrons.

4. 14. Methodology

Survey method was used to collect data on the Implementation of Information Resource Development Policy in Academic Libraries in Nasarawa State. This method was found appropriate for this study because the research work used sample of the population to find out the implementation of collection development policy in academic libraries in Nasarawa State.

The Population of the study consisted of some of higher institutions of learning such as Federal University libraries Lafia (5), Nasarawa State Colleges of Education libraries Akwanga (4), Nasarawa State Polytechnic libraries Lafia (4) Nasarawa State University Keffi (7), Nasarawa State College of Agriculture Library Lafia (4). All Heads of acquisition librarians and other professional librarians directly involved in resource development in the libraries were target audience. Twenty four librarians were used while purposive sampling technique was adopted. This is because the study area had 5 academic libraries with a total of 24 targeted populations. The researcher, therefore, made use of the entire population as subject of the study, since the population was very small. Benard (2012) Opine that when a population is less than 200, all population should be used as sample. The instruments used for this study were questionnaire. The questionnaire was administered directly to the target respondents by the researchers in collaboration with a research assistant from each of the institutions. Descriptive statistical technique was use. For the purpose of accuracy, percentage distribution was used in describing the data which were presented in tables.

4.15. Response Rate

Twenty four (24) questionnaires were administered 24 (100%) were returned duly completed. This is realistic enough to base any analysis on.

Table 1. Availability of Written Information Resource Development Policy in Academic Libraries in Nasarawa State

S/NO	LIBRARIES	Available	Not available	Date of formulation	Date of Modification
1	Federal University libraries Lafia	–	Not available	–	–
2	Nasarawa State University Keffi	–	Not available	–	–
3	Nasarawa State Polytechnic libraries Lafia	–	Not available	–	–
4	Nasarawa State College of Agriculture Library Lafia	–	Not available	–	–

5	Nasarawa State Colleges of Education libraries Akwanga	Available	_	_	-

Source: Field work

The findings as revealed in Table 1 above clearly indicate that, out of the five academic libraries studied in Nasarawa State, only Nasarawa State Colleges of Education libraries Akwanga have a written Information Resource Development Policy. This implies that those academic libraries that don't have a written Information Resource Development Policy have been developing their resources without any guidelines or standard; and this could lead to bias on the part of the acquisition librarian and acquiring of irrelevant materials that would not meet the information needs of the clientele. Every academic library needs a well-coordinated, written and functional development policy to guide her selection.

The five libraries were physically inspected with a view to finding out the extent of their coverage in terms of contents. Ten broad content sub- headings were identified from most of the literature reviewed which include among others; mission/vision, objectives, core values, sources of fund, weeding and selection of materials. The written policies were checked to find out which among them has all the ten sub- headings covered. Table 2 below shows the findings.

Table 2. The level of Awareness of Information Resource Development Policy by Staff of Academic Libraries in Nasarawa State.

S/NO	LIBRARY	AWARE	NOT AWARE	TOTAL
1	Nasarawa State Colleges of Education libraries Akwanga	6(25%)	2(8.33%)	8(33.33%)
2	Nasarawa State University Keffi	2(8.33%)	5(20.83%)	7(29.17%)
3	Nasarawa State Polytechnic libraries Lafia	2(8.33%)	7(29.17%)	9(37.5%)
4	Nasarawa State College of Agriculture Library Lafia			
5	Federal University libraries Lafia			
Total		**10(41.67%)**	**14(58. 33%)**	**24(100%)**

Source: Field work

From Table 2 above, 10 of the respondents, representing (41.67%) of the sample populations are aware of the information resource development policy of the library. This call for the need for libraries to develop a functional written and functional information resource development policy.

Table 3. Criteria for Evaluation of Information Resource Development policy in Academic Libraries.

S/NO	Libraries	Effectiveness		Efficiency		Flexibility		Institutional Constraints		Community Acceptance	
		E	**NE**	**E**	**NE**	**F**	**NF**	**IC**	**NIC**	**CA**	**NCA**
1	**NSCE**	**4**(16.67%)	**3(**12.5%)	2(8.33%)	2(8.33%)	3(12.5%)	3(12.5%)	3(12.5%)	1(4.17%)	2(8.33%)	1(4.17%)
2	**NASU**	_	2(8.33%)	-	4(16.67%)	-	5(20.83%)	6(25%)	_	_	7(29.17%)
3	**NSP**	6(25%)	_	4(16.67%)	_	3(12.5%)	_	9(37.5%)	_	2(8.33%)	_
4	**NSCA**	_	_	_	_	_	_	_	_	_	_
5	**FUL**	_	_	_	_	_	_	_	_	_	_

Note: E- **Effectiveness** NE- **Not Effectiveness** **E- Efficiency** NE-Not **Efficiency** F- **Flexibility** NF-Not **Flexibility** IC- **Institutional Constraints** NIC-No **Institutional Constraints** CA- **Community Acceptance** NCA- No **Community Acceptance**
Information Resource Development policy **(IRDP)**
Source: Field work

Table 3 revealed that the 3 academic libraries: Nasarawa State College of Education, respondents 4(16.67%) effectively evaluate IRDP, in Nasarawa State University Library respondents 2(8.33%) opine that IRDP was efficient and in Nasarawa State Polytechnic Library 6(25%) express that, they use written policy to effect and use the criteria listed in the evaluation of their information resource development policy. This implies that the libraries will be able to tell if their policy meets the aims and objectives of the library and the institution as a whole. Based on this also, the researchers found out through the questionnaire that 4(16.67%) of the library staff from Nasarawa State College of Education and Nasarawa State Polytechnics Library with frequency of 6(25%) have the written policy known and evaluated by staff at the interval mandated for the policy reviewed. Library Information resource development policy was established in 1976 but its policy was only reviewed in 2014 and even in the reviewed policy it was not stated at what interval it will be reviewed next. Although most University Library information resource development policy are normally reviewed at the interval of every 3-5 years, but this has not been visible because the policy was formulated in 2003 and only reviewed in 2012 which is an interval of nine years. A regularly updated policy provides a valuable tool for resource planning, development and evaluation of the resources in the library. With regards to this, the resource policy in any library should be reviewed after 5 years, because things and people do change likewise information needs of users.

Table 4. The Challenges Encounters in Information Resource Development Policy need of Patrons in the Implementation

S/NO	LIBRARIES	Available	Not available	Date of formulation	Date of modification
1	Federal University libraries Lafia	_	Not available	_	_
2	Nasarawa State University Libraries Keffi	Available		_	–
3	Nasarawa State Polytechnic Libraries Lafia	Available	Not available	_	–
4	Nasarawa State College of Agriculture Libraries Lafia	–	Not available	_	–
5	Nasarawa State Colleges of Education Libraries Akwanga	Available	_	–	-

Source: Field work

In Table 4, enormous challenges abound in the information resources development policy, amongst the five higher institutions visited, only Nasarawa State College of Education Library has functional Information Resource Development Policy while Nasarawa State polytechnic and Nasarawa State University Libraries Keffi sometimes take into cognizance Information Resource Development Policy need of Patrons in the Implementation. This call for an urgent written developmental policy.

Findings

1. The findings of this study revealed that 4(16.67%) from Nasarawa State College of Education and 6(25%) from Nasarawa State Polytechnic academic libraries studied have written information resource development policy. And the Information resource development policies of these academic libraries contained all the components of information resource development policy. The findings revealed that all the components of information resource development policies are

extensively considered when developing information resources in the academic libraries that have a written policy.

2. Similarly, it was established by this study that the libraries with written policy do implement their resource development policies in their resource development. The implementation of these policies proved to be effective in the libraries since they guide them in developing rich and useful collections.
3. It was also discovered that information resource development in these libraries are extensively guided by the policy, in the sense that, whenever information resource is been developed, the policy is always used as a guide.
4. It was found out that the libraries with written information resource development policy do make use of all the criteria which include effectiveness, efficiency, flexibility, institutional constraints and community acceptance in evaluating their policy.
5. It was further discovered that changing information needs of patrons have extensively affected the implementation of information resource development policy in the academic libraries with written policy because patrons now have more interest in electronic resources than print hence their policy needs to be reviewed.
6. The study also discovered that many staff of the libraries studied; including some of the information resource development divisions are neither aware nor, not aware of the existence of information resource development policy in their respective libraries.

Conclusion

The goal of information resource development policy is to ensure consistency among those who have the responsibility for developing the collection and provide a tool for evaluating and improving collections for all relevant subject disciplines. If Academic libraries view their information resource development policy as a living document, its continual review and revision will keep it current with the changing universe of electronic resources. The importance and value of information resource development policy lies in the context it provides for every decision made in a library. It will define the issues, identify the questions that need to be asked and guide answers that respond to institutional priorities and library mission.

From the findings of the analysis carried out on the implementation of information resource development policy in academic libraries in Nasarawa State, it showed that most of the libraries are not having the written information resource development policy, those libraries without information resource development policy are bound to acquire information resources that are not relevant to the educational curriculum of their institution. The libraries that are particularly with written policy are guided by the policy in their information resource development. This has encouraged the provision of acquiring relevant and current information resources in line with the educational curriculum of their parent institution and their users' information needs

Recommendations

1. Academic libraries in Nasarawa State without the policy should form a committee that will help in formulating information resource development policy which will serve as a guide in information resource development and also serve as assistance to the new staff
2. Academic libraries in Nasarawa State should try and compare their policy with that of UCD library in Dublin because of its standard, this will help them strengthen their policy implementation and make adjustments where necessary.
3. Having information resource development policy is one thing and implementing it is another. Academic libraries without a written policy should make sure that after formulating the information resource development policy, the policy should be fully guided for information resource development. It should not be done haphazardly; otherwise the aims and objectives of the institutions will not be achieved and it will help them utilize the little fund made available to them.

4. All acquisition librarians should be involved in the formulation and evaluation of information resource development policy in order to keep them current on issues affecting the policy. Information resource development policy should be reviewed at least after every five (5) years to give room for new changes.
5. Libraries should ensure that all staff are not only aware of the information resource development policy but also conversant about the contents. Libraries should periodically organize seminar for staff where the contents and implementation of information resource development policy will be discussed.

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CHAPTER FIVE

ARCHIVES AND RECORDS MANAGEMENT PRACTICES IN UNIVERSITY LIBRARY: A STUDY OF LEGACY UNIVERSITY, THE GAMBIA

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Abstract

The purpose of this research was to investigate Archives and Records Management Practices at Legacy University in The Gambia. The primary goal was to determine the record and archive management practices used by Legacy University's registry department in The Gambia. To achieve these goals, the problem statement, study purpose, research questions, and study significance were developed. The case study

technique of research was used to perform the study. Data were collected using a questionnaire and personal observation. The study's population consists of ten (10) staff members. The study's findings suggest that the registration department of Legacy University, The Gambia generates records on a regular basis, and the objective of these records is to provide services for academic, public, historical and other purposes. Recommendation was made for effective management of records by using technological gadgets such as; computers, digital camera, scanners, photocopier machines, etc.
Key Words: Records and Archives, Administrative value, Record management Record center, Disposition

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5.1 Introduction

One of the most difficult, difficulties we face today is how to efficiently and economically govern and utilize an ever-expanding information base. On all levels of government, as well as in industries and businesses, technological and societal changes have necessitated the generation and dissemination of an infinite number of records in various formats. Record management is focused with the preservation of historical accumulations for long-term business usage or in educational institutions. Record management has become the foundation of a collaborative identity in information management. Records are useful administrative tools because they give background information for decision making. Business enterprises and other organizations are an essential component of today's business system.

Records are also any discrete items that stores information irrespective of its physical form that is, an accounted trend of events in written and unwritten form preserved for historical and future reference kept from one generation to another. So, in respect of this, Record is defined as written or other permanent account of facts, e.g. school attendance, road accident, hospital attendance, or diagnosis treated in an hospital, or account kept by book keepers or books stored in libraries, or sales of articles produced in a factory, number of staff and their pay roll in establishment, or judgment in law court etc. The account of each of these events is usually written down at the time it occurred and preserved as authentic evidence for present and future reference so any institution without record of its activities will be like a factory without a records of its products.

Furthermore, Records are the sum total of all documentary materials regardless of their physical form or characteristics created or received and maintained by an organization or other entity in connection with the transaction of its business and its other activities. An entity's records are the whole, the universe, form which its archives are selected. The comparable records of an individual or family are often called papers or manuscripts, but there are no essential differences in the nature or handing of these materials. Physically, a wide variety of media have been used for records keeping during the course of human history. Includes are clay tables, papyrus, palm leaves, and parchment. In modern times paper documentation of various kinds has evolved from the medieval parchment. The so called textual records. In addition, many non-textual documentary forms have been brought into being `by the new technologies of the 19th and particularly the 20th centuries. Still photographs, motion pictures, films, video tapes, sound recording, magnetic tapes, and related machine readable forms. All these regardless of their special physical characteristics are considered to records and therefore are potentially archives if used by an organization or other entity for records keeping.

5.2 Records have a life cycle which starts from;

- The creation phase
- To the distribution
- Maintenance
- Storage
- Disposition which will now involve the preparation of retention/disposition schedule.
- Finally, Records play a vital role in the progress of mankind.

Records are necessary because they contain all the information vital to the daily operation of a business, organization, government, association, institution and even person. So, records form the back bone of any organization or institution of learning. It is for this reason that information handling in recent years has become a science in itself.

Archives constitute one of the world's primary information sources. They arise and grow uniquely out of the activities of any organization or institution, a family or even an individual. Although, there is no general acceptable definition of the word "archives" in this study it will be taken to mean a place where public records are kept or it can be equally refers to those records of institute, organization, public or private or other entity that have been selected for preservation because they possess enduring value. The term is a collective noun derived from the Greek word arch ion (that which belongs to an office) and originally was applied to government records. (Public archives) that is to say, document and other historical matter of all kind, nature and description which are in the custody of any public office or which may be transferred or acquired by the National archives of Gambia.

The term archives is also used to designate: an agency or administrative unit responsible for identifying, appraising, accessioning, preserving, arranging, describing and providing reference services on archive materials and for approving the destruction of records of transitory value. Archives are also a building housing archival materials and providing office space and facilities for both archivists those engaged in the administration of archives and users. Furthermore, archive can be seen as a place where people go to find information. But rather than gathering information from books as you would in the library. People who do research in archives often gather firsthand facts, data, and evidence from letters, reports, notes, memos, photographs, audio and video recording and other primary source. Whether or not, one would probably have archives in their homes. It might be in a filing cabinet in the study, in a box in the basement, a chest in attic or even in all three. This serves as personal archives: a collection of material that record important events from your family's history.

There are similarities between family's archives and local, state, or national archives. All save items to serve as proof that an event occurred or financial or sentimental reasons. The differences between them are archives come in all shapes and sizes. There are national archives, states archives community archives, business archives, churches and mosque archives and more. There are also archives for different types of government records and also archive that contain the personal records of people and organization .there are also archives that contain the personal papers of famous leaders (for example Martin Luther, king, j.) Authors (for example, Maya Angeolou and Earnest Hemingway) a scientist (e.g. Albert Einstein and Marie curie) performs religious and business leaders, social archivist and more. Finally, the non-current records needs to be properly kept because of their referential, remembrance, evidential, historical planning and managerial valves.

5.3 Statement of the problem

Legacy University, The Gambia came into being in June 2018. One of the objective upon which the university is founded is to impact knowledge and learning to men and women for all race, without any distinction on the grounds of race, religious or political beliefs. To fulfill the above objective, many administrative structures are put in place. Among these structures is the information and protocol unit. This unit is charged with publicity and protocol functions in the university. It usually published Legacy University News bulletin which appears in regular basis and in special occasion. The regular bulletins contain reports of the activities within the community. While the special issue contain information requiring urgent public attention. The kinds of documents created in Legacy University have problems on document and archival management specifically in the registry unit. Problems associated with records and archives management in registry unit is poor in nature in which documented records such as papers are being arranged without investigating their sources and relationship, improper filling, Improper staff and student identification numbers, wrong systems of coding records are so large that some records are misfiled. The method of conservation and preservation is poorly established that some storage cabinets and shelves are not fumigated. Enough storage spaces and facilities are not provided such as metal cabinet which can protect document from burning in case of fire outbreak. Some document has lost their physical and chemical composition due to the way they are stored. Document are subject to acute human, insects, fungi, climatic

and chemical disaster due to poor conservation and reservation practices, most of the electronic archival materials such as television, video cassettes, video coverage, CD plates, DVD plates, audio cassettes are damaged by improper storage, lack of maintenance, preservation, and lack of orderly arrangement. There are equally problem of inadequate records management such as record creation, record usage, record storage, record maintenance, retrieval device, record arrangement in how records are being coded. Staffs under which these documents are in custody have poor management skill and are not mindful of changes in information technology devices that intend to improve records and archival management practice. Most of the staffs are not computer literate and cannot handled new emerging technology such as internet, computer storage devices, which in developed country help to increase efficiency and improve their effectiveness.

From what happens in registry unit, there is no proper preservation of record and archival materials because observation have shown that, there is inadequate manpower, inadequate equipment's, and some of the facilities they used are out dated equipment and above all financial constraints. Retrieval devices are not prepared for these documents that will facilitate easy retrieval such retrieval devices like indexing, labeling, are not done. Therefore, retrieving of information from such records becomes quite intimidating. Also, proper shelving of records is not done and cabinet are not adequate for the storage of records. While investigating or evaluating how records are kept in any organization and who uses them with the purpose of studying, records keeping addresses certain needs. From this comparism, the problem faced with the preservation of records in registry unit can practically affect the realization of objectives of record keeping since we know that, the major goal of record keeping is to be made available and to discover how these records can be made accessible to the organization. Record keeping help to benefit the institution i.e. evidence of job done or for future reference. Now that the registry unit are faced with these challenges, these can affect the realization of objectives of records keeping. Hence, the aim of every organization is to attain certain objectives. Above all these challenges therefore, the researcher recommend useful solution to overcome such problems as they are competent of hindering the role of expectancy of the unit and achievement of the university in general.

5.4 Objectives of the study

The Objectives of the study is as follows:-

1. To examine the kind of records are generated in Legacy University, The Gambia. (LUGA) registry unit.
2. To find out the methods/ problems the unit is facing in terms of its records management.
3. To know how these records are generated and accessed.

5.5 Research questions

The research questions are as follows:-

1. What are the kinds of records generation in Legacy University, The Gambia. (LUGA) registry unit?
2. What are the methods/ problems the unit is facing in terms of its records management?
3. How these records are generated and accessed?

5.6 Concept of records

Public organization create, process and use records in performing their duties and they are also responsible in managing these records in its entire life span. Ayeni (2010) defined records as "statements, fact, figures, that are recorded in form of impression and expression, purposely established for remembrance and reference." He went further to say that records are evidence of events, activities, programmes and facts in any form or medium like court proceedings, map. Correspondences and other documentary materials regardless of their physical form, features or characteristics.

Bitagi and Garba (2018) agreed with Ayeni in their paper when they defined record as "a piece of information created by or received by an organization or business establishment that gives evidence of a business decision or transaction." Cordelia (2017) in her own opinion, defined records as documents regardless of form or medium created, received and maintained by an agency, institution, organization or

individual in pursuance of its legal obligations or in the transaction of business. Records are necessary in any organization in other to achieve adequate and proper documentation of the policies and transactions of the establishment and for effective and economic management of the agency operations.

5.7 Concept of archives

Bradsher (2010) says that, archives carries a more matter- of- fact significance: a place in which public records or other important historic documents are kept (it may also refers to any records or document so preserved) The generality of this definition conceals the surviving role of the archive as a seat of power in the older sense of the archaeon, because archive tends to be maintained by leading institutions in field like history, law, medicine, science, genealogy and business both their contents and the definition of paper "archival" materials are subject to controversies which mirror large power struggles in society.

Hilary (2012) has argued that, on archive is an artificial or deliberate collection of objects (as in a library or museum) but a collection which accumulates naturally in the course of administrative affairs. In a broader sense, Derrida (2005) point out that, the term "archive" may be divorced from its institutional sense and applied to any collection amassed with care for the preservation and unity of the materials within. It may be public or private. It can be a library, museum, government depository, corporate record house. Or even a personal collection of texts. It essential quality is that; it materializes memory, the archive is thus, a prosthetic medium, supplementing the human brains limited capacity for storage.

Derrida (2017) further stressed that every archive is by nature both revolutionary and conservative at the same time. It is liberal in its general purpose as a repository, whose function is to serve (either society or some part thereof) and to extend the cultural patrimony. It conservation character derives from its need to maintain order and the inherent necessity of caution and protection against outside forces, decay and entropy. In archive fever, Derrida argues from Freudian psychoanalytic theory that the need to build and keep archives is a product of the repetition compulsion (also described as the "death drive"), in other word, the impulse to create records as closely bound to the impulse to destroy or erase memory.

Archives have typically held actual records and collectible things. Not only books and documents, but films, microfilms, videos, medals, coins, stamps, art works, and many more artifacts are frequently referred to as archived. Today, it is becoming usual to talk about "digital archives" where material is preserved on magnetic media, CDs, DVDs, flash storage, or other comparable forms. So, for these reasons, I believe that archives affirm the past, present, and future; they preserve the records of the past and embody the promise of the present for the future.

5.8 Archival records practice

In the 20th century archivist have been faced with handling new kinds of records, such as photographic records, motion pictures, sound recording, and computer-kept records, microcopy, or microfilm, the legal status of which as records copy usually has had to be determined by special legislation, is a practical medium for making additional copies of records as security against risk through acts of warfare: as preservation against normal deterioration or damage; for us in international exchange: in lieu of loan or as a convenience to scholars; for reducing cost of repairs, binding and storage as a means of supplementing by collateral materials; bodies of records; and as a form of publication.

Practice as well as belief has varied from country to country. As the concepts of social, economic, and cultural history developed, as industrialization played an increasingly prominent role in national and international affairs, as democratization spread over the surface of the globe, so there was an increasing awareness of the significance of business archives, institutional archives, and the papers of persons not necessarily distinguished. Germany was the first to recognize the value of business archives; Belgium, Switzerland, and Netherlands followed shortly; France, England, Denmark, and United States are examples in varying degree and nature of later recognition.

5.9 Records and Archival management

The concept of records management evolved even before the introduction of writing / paper and printing and printing technology, knowledge on paper has become so diverse that at a time it led not only to knowledge explosion but also inadequacies of how the records produced could be managed in such a way that it could be stored, retrieved and disseminated with minimum effort and efficiency.

Records management is interpreted in many ways. To some, the term means the management of records rights from the creation, distribution, uses, maintenance, retention, and disposition. This opinion is supported by Alliance Paper Chase (2019) when it defined records management as "the field of management responsible for the systematic control of creation, maintenance, uses and. disposition of records." It went further to explain that it the planning, controlling, directing, organizing, training, promoting and other management activities involved in records creation, maintenance, use and disposition in other to achieve adequate and proper documentation of the policies and transaction of the organization and effective and economical management of operations.

On the other hand, records management society of Great Britain in Ajewole (2010) defined records management as "the application of systematic analysis mid control of records from their creation through processing, maintenance and protection to their final disposal. It is the control of quantity and cost".

Records management according to Abioye (2012) is the planning and control of the uses of a set of resources to achieve one or more objectives. This presupposes that there should be adequate planning and strict control of records so that they could be traced without difficulty and within a specific time.

The above ideas was supported by Enwere (2017) when he opined that records management should enable people to find their way through a flood of information and assist decision makes to arrive at just and correct decisions. To achieve this objectives. Enwere, further observed that records should pass through three stages of management in their lifecycle. In his view, the first stage is the current stage in which records are managed in the offices that created them. The semi-current staged, his argue is that, which records arc managed in the centre while at the non-current stage, records are managed in the archives.

It is therefore vital to understand that, records management is thus concern with the entire lifecycle of records as they progress through the basic system stages. Records management is p t in place to enhance organizational efficiency. It is unfortunate however, that a lot of executives and personnel in many establishment in the public organization do not fully appreciate the potential of records management. As a result. Systematic records management is often left to chance.

5.10 Archival management

Archives as records accumulated in the course of the day-to-day business of individual and organization that are found worthy of preservation came about through the process of human civilization itself. According to Gualiemino (2019) says "the effective management of archives requires some degree of human conceptual and technical skills that will help the archive to achieve the desire goals."

According to Evans (2013) archives "are records of an entity that have selected for preservation because they possess enduring value" even though archival records are selected just like the library materials, they have an additional quality of enduring value for storage, preservation and conservation. So, for this reason archives need to be properly managed. Cook (2012) expatiated on archival management as a unitary service situated among the cultural departments of governments charged with the management of government records of the legislature, the cabinet or council of ministers and the court of law. It is from this central point that the management of a public archives spread out through the various agencies of government.

All government should established and maintain archival institutions, so as to preserve, maintain, and use the public records of its jurisdiction.

5.11 Concept of information / protocol

Information means different things to different people in different situations and at different times (Aiyepeku 2013). There are several definitions by various proponents of information over the years world over. Tiamiyu (2010) defined information as "the meaning or knowledge intended by the creator, user or sender of some data or inferred from such data by intended recipients of the data". Oyedum (2017) in her own view defined information as "that which is transmitted in the process of communication". The author went further to look at it as "a process of conveying a message from the source through a medium to the receiver". Eteng (2018) defined information as "data that has been subjected to some processing functions capable of answering a user's quarry, be it recorded, summarized or simply collected and this would help in decision-making". This definition is concord by Ford (2019) when he defined information as "a meaningful organization of data and knowledge". Hayes (2010) tends to agree with Ford when he viewed information as a property of data resulting from or produced by a process that produce the data. The process may be simply data transmission; it may be data selection; it may be data" organization; it may be data analysis. For the purpose of this study, information can be defined as a framework, a background for conservation to produce concrete actions or to open up possibilities.

Standard Dictionary International Edition (2017) defined protocol "as a code of behaviors, etiquette, rules of precedence that are to be properly observed in public relations activities such as arrangement of venue of occasions, designing programmes of activities". Protocol refers to the set of rules or procedures, systematically designed to be duly observed on diplomatic occasions.

In an interview with Mr. Bitrus .I. Galmaka (information and protocol officer) of Legacy University, The Gambia stressed that protocol activities in Legacy University, The Gambia is no different from other establishments. It rather extends to a wider scope as taking the searcher round the offices to see how they keep their records and in addition to that, on how they produce Legacy University, The Gambia bulletin. The successful operations of information and protocol unit are largely based on the records and document previously kept and the subsequent ones added for reference purposes. It is the accurate and efficient records managements that contributed to the good reputation of Legacy University, The Gambia.

5.12 Lifecycle of records

Records go through the stages of life that human being also go through. They are com (created or received), live an active life (frequently used) retire (transferred) and die (disposed). (Afolabi, 2011). Public records include all recorded information created or received by any public office in the course of performing its business. They take the form of conversional document on paper, but also are in microfilms and electronic compartment such as tapes, computer diskettes, Dash drives, DVDs etc., that may be recorded in the process of performing official duties. Afolabi (2011) identify five stages in the life cycle of records, namely stage of creation or receipt, stage of usage and maintenance, stage of transfer and disposal.

5.13 Record creation

According to the author, the first stage in the record life cycle is creation reception, which occurs when organizations produce or get records. Records creation at every level in any public sector is a rapidly expanding activity, resulting in a plethora of files in several offices. Daramola (2012) explains that before the development of typewriters, handwriting experts acted as secretaries. This period produced essential and vital records. There was no room for extra copies, and records were only made as needed. Daramola went on to say that the proliferation of records began with the introduction of typewriters and photocopiers between 2015 and 2017, when hundreds, if not thousands, of copies could be cheaply generated. This trend is related with the problem of managing these new set of paper-based records. The solution is this, the author believe is the effective control of records creation through the establishment of records management program to ensure good administrative as all levels of public organization, It is therefore, essential that all public organization including the information and protocol unit of Legacy University, The Gambia should have reliable procedures of creating. Preserving, conserving and managing their records in other to be efficiently and effectively.

Records creation is the first phase of records management. In the public sector, a records is created when a letter is written to a business associate; a form is sent to a job applicant; a file is open on a person or policy issue; and existing copies is placed on a photocopier and copies are made or when treaties or contracts are signed. (Mgbolu, 2019)

Records created must be useable and also enhance the value of existing ones. When they are not well dealt with, they could become a proliferation. This assertion is supported by Thurston (2014) in his paper when he observed that in many establishments, files are simply kept on large omnibus records series which bear no relationship to the functions and activities of the creators. He maintained that within the series, each new file simply receives the next running number. The titling of the file is not centralized. There, are several file relating to the same subject. Misfiling is a common occurrence and lack of file and frequent loss of file often lead to opening of temporary file.

5.14 Records use and maintenance

The second stage in the life cycle of records is that they are used. This use may be or reference, administrative, informational and research purpose. Usage is the purpose for which records were created. Only those records that would be needed for later reference need to be stored and protected.

Ayeni (2016) stated that civil service just like any other institution has dire or urgent need for records, arising forms their inestimable utility value. Records as written memory of management are kept for a variety of reason, depending on the objectives, functions and changing environment in public organization. The prime determinant of record utility, according to him, will be the objectives, functions, transactional activities and client or market orientation of the corporate entity concerned. He, however, emphasized that the most important thing is that the data and information on the records are correct, relevant and clear.

Records use and maintenance involve the control; use and storage records needed to carry out or facilitates the activities of public organization. Mgbolu (2019), stressed that the measures is to ensure ready availability of needed records, effective use of current records, and selection of supplies, equipment and location for the storage of records.

If records are created without plans for their maintenance, they are left in shamble and their condition causes chaos in an organization. Surgeon described the activities records maintenance in Daramola (2012) as "receiving into custody, organizing and maintaining materials so that, they will be kept safely form physical hazards, securing against unauthorized access and conveniently for ready reference". The functions of records maintenance in an organization is concerned primarily with filing of records, records storage and "cords location. Classification, filing and indexing are actions that ensure adequate preservation of records.

5.15 Storage and preservation

Storage is one of the phases in the life cycle of records. Its importance in the effective management of records cannot be over-emphasized. To underscore this crucial role, Diebold (2015) noted that "one of the basic functions of an office is storage of records for future reference use". Afolabi (2011) maintained that "records that are found to be useful and would be consulted at a later time are stored and properly protected. According to him, records that are considered to be highly useful are stored in insulated cabinets that are capable of withstanding extreme heat in the event of fire.

Filing is one of the forms of data storage. Ajewole (2012) defined filing as "the process of arranging and storing records in an orderly manner, so that; they could be located with ease as and when required". Filing is an age-long means of preserving records and also a tool in the effective management of records.

Storage and protection, according to Atom (2016) said, storage can be manual, electro-mechanical or electronic. According to him, manual method "is the traditional way of doing things by hand with virtually no input from mechanical or other equipment" for this method, storage is by filing system (file jackets, cabinet) e.t.c. and still very much in use in most registry system in our public sectors.

He went further that, the electro-mechanical is more technological-oriented method which is basically the mechanization of the manual method. The storage method here consists of the mechanized filing system; source-coding system and document reduction system. The electronic method involves the use of computers in performing task and functions hitherto performed manually or mechanically.

5.16 Stage of transfer

Transfer is the fourth stage in the life cycle of records Afolabi (2011) assert that it is the stage when records are no longer actively used or referred to infrequently, and have to be removed to create space to house actively used records". He further added that, "the space occupied by inactive records becomes expensive" they are then removed to remote storage area where space is less expensive. In addition, when the inactive records are not separated from active ones, inactive records create problems in retrieving information. Also the non-current or inactive records of an organization or institution are retained because of their reference value, are referred to as archival records.

5.17 Stage of disposal

The final stage in the life cycle of a record is disposal of records. According to Afolabi (2011) said "when records are no longer useful, they should be disposed by destroying them". He added that, the decision to destroy any record should be made by the management which is usually guided by disposal policy. It is important that, there should be periodic destruction records that are no longer useful to an organization or institution as its serves no purpose of keeping them. To him, in business organizations records that should never be destroyed includes legal papers of incorporation, titles of ownership, deeds, major contracts, property plan etc.

Below is the brief summary of life cycle of records and management activities involved in each stage or phase.

- ✓ ***Creation: -*** creation of records to support an operational functions examples; correspondence, directives, reports, forms, computer files, microforms.
- ✓ ***Distribution: -*** internal and external includes: post and carrier service, fax, inter office mail, personal delivery, electronic mail and other direct access to computer files.
- ✓ ***Use: -*** administrative, fiscal and legal purposes.
- ✓ ***Maintenance:-*** indexing, filing, retrieval
- ✓ ***Disposal: -*** transfer secondary storage to archival storage, destruction or alternative final disposal.

5.18 Records and Archives as Sources of Information

The important of records and archives as a tool for consultation cannot be over emphasized. A part from their basics character and use, however, archives have an additional valve because of the informational data they contain. Archives constitutes an unsurpassed source for research on virtually every aspect of human existence, past and present, regarding which records have been created and maintained.

Records and archives are valuable to the government entities that initially produced them as evidence of their origin organization, policies, programs and principle operation over times and for long term legal financial and other administrative purposes.

Archives serves as sources of information to scholars working in the field of history, other humanities and social sciences but also in the natural sciences in pursuing the research.

They also serve as sources of information to provide individuals and unofficial bodies in other to safeguard rights of various kinds and to assist in meeting their obligations.

5.19 Accessibility to records and archives in public organization

Providing access to records and archives in public organisation are some of the major reasons for the existence of archives: (ward 2000). Indeed, the important mission of many national archival institutions is to facilitate access to their holdings.

Access to public records facilitates continued availability of records to the public organisation. Public archives and records belong to the public, so they must be accessible as evidence for decision and for which governments are accountable to citizens.

According to Guecio (2011) the principle role of records is in fact that of rendering the act or fact, ehich is the subject of the records in its original administrative contest, accessible and knowable across time and space. The need to make records and archives accessible and knowable across time and space is reasons enough to necessitate research into their protection and to justify investment of public money into their preservation.

In other words, access to public records and archives is key to:

- Accountable decision making;
- Effective and efficient public participation in government affairs;
- Preserving collective memory;
- People's right to access information, to enable them more fully exercise and protect all of their right;
- And effective research and efficient administration.

5.20 Organisation and Arrangement of Records in Public

Arrangement thus is largely a process of grouping individual document into meaningfull units of grouping such units a meaning full relation to one another. An essential operation in the management of records centre is the arrangement of document. Arrangement is essential to the preservation and conservation of records in terms of disposition and housing in the archives and the administrative control, an essential part that leads to the exploitation of records in reference and research.

Levels of Arrangement

The arrangement of records takes place in various degrees on different levels. These levels are:-repository, records group/ collection, sub groups, series, file unit and document.

a). Records group: - a records group is defined as a body of organizationally related established on the basis of provenance i.e. arrangement of the record group level consist of allocating new accessions of records on the basis of provenance to existing records groups. However, in establishing records group, the concept of provenance, though, fundamental may be modified by other pragmatic consideration particularly the administrative history, the complexity and the volumes of the records involved. It is the largest unit of management in relation to physical control. They are records that originate from a common source. In the university for instance, the records of an academic department of the vice chancellor's office might constitute one records group.

b). **Repository**:-once decision has been made at the record group level; the records constituting that group are then allocated to an appropriate custodial unit for placement in the stacks of the repository level which necessarily will vary with the type of repository and in the same repository with the growth in the volume and character of its holdings.

c). Subgroups: - The third level of arrangement is that of subgroups within records groups. The subgroups concept is intended to distinguish between and to control the records of all primary subordinates offices or other administrative unit that together constitutes the records group, including any records of predecessors agencies each subgroup in turn is divided into as many levels as necessary to accommodate the successive subordinate organizational units that make up the administrative hierarchy of the subgroup for example, a bureau may be divided into divisions each of which has several branches, each of which has several sections and so on.

The typical arrangement of subgroup is thus by administrative structure. The hierarchy of the offices of origin of the records but where successive re- organizations or the consolidation of records series between offices obscures hierarchical origins, subgroups and subordinate levels there may be established in terms of functional, geographical, or chronological relationship or if necessary on the basis of the physical forms of the records.

d). Series (or Class): - Arrangement of the series level then takes place in the framework of subgroups in each record group. A series in the archival sense consist of document in file unit that are normally structured or arranged, by the office that originated, maintained, and used them in accordance with a filing system or that were otherwise maintained as a collective unit by that office because they relate to a particular function or subject result from the same activity that have some other unifying relationship arising out of their creation, receipt or used.

e). File Unit:- Once the series have been arranged and organized in the subgroup structure at a particular record group, arrangement then proceed to the file unit level, since most series are already arranged in accordance with filing system used by the originating agencies. Arrangements at this level consist of simply verifying the correct placement of each file unit that system and of correcting obvious misfiles. The file unit will be the individual files containing letters for the minute's series, it would be the individual file containing the minutes of previous meeting. File may be managed by chronological, alphabetical, topical, geographical, personal or organizational and numerical.

f). Documents: - The final level of arrangement is the document level. This involves checking the individual documents enclosures and annexes and the individual pieces of paper making up multipage documents that collectively constitute the file unit and correcting their placement when necessary. It is a single record. Filing is commonly chronological or alphabetical or both.

5.21 Preservation of records and archives in public organization

Preservation of public records and archives should be the main target of preservation efforts because it is apparent that public and private organizations are the largest producer and user of information (Blunt 1995; Evans, Amodea and Carter 2019; Heck 2010). At this juncture, one may ask the question that was posed in 1947 by Sir Hilary Jekinson, one of the most eminent archivists.

"Why all this fuss about archives"

Archives, whether public or private, generally concern individuals' legal, social, political, and economic rights. They uphold individuals' legal and moral rights. They also create evidence that can be used to support or refute the integrity and judgment of the government. Records and archives must be conserved because their format, the environment in which they are stored, and how they are managed and used jeopardize humanity's capacity to access the information they contain. It has been claimed that humans are "unquestionably the greatest enemies of the materials on which they record their thoughts." Humankind is the underlying source of the conditions that accelerate or slow the decay of documentary materials. (The Library Association, 2012). Humans have little influence over the nature of the materials used to create records and archives. Most environmental elements that trigger the duration mechanism of documents can be regulated. The atmosphere in storage facilities is critical for the preservation of records and archives. Environmental influences include biological agents, temperature, and relative humidity. Air pollution, grime, and sunshine can all accelerate the destruction of documentary materials.

The elements that can hasten the deterioration of records and archive materials are described in greater depth in the following subsection. Temperature and relative humidity. It is critical to keep the temperature and relative humidity (RH) in record storage rooms at appropriate levels. According to Ogden (2008),

controlling temperature and relative humidity is crucial in the preservation of documentary materials because they considerably contribute to material deterioration. Although there are no agreed-upon guidelines for temperature and relative humidity in storage and use areas, the preservation community agrees that lower temperatures and relative humidity significantly increase the life expectancy of documentary materials. The incorrect setting might cause archival collections to have a relatively limited lifespan. Therefore, regulation of temperature. The wrong environment can doom archival collections to a very short life span. Therefore, control of temperature and relative humidity level should be the comer's tone of any responsible preservation programme.

Light

Light can cause some papers to bleach and others to yellow or darken. It can also cause the media and dyes to fade or change colors, altering the legibility and appearance of documents. (Adock N.D) argued that light damage is irreversible. Therefore, light levels must be kept as low as practically possible in storage, reading and display areas.

Sources of light are and incandescent and fluorescent lamps, the two primary artificial light sources in use in most records offices and archives. Exposure to natural light is undesirable because of its intensity and high ultraviolet (UV) content. Ultraviolet radiation is the most energetic and destructive form of light. (Patkus 2011) they cause photo chemical deterioration to happen more quickly and they are extremely damaging.

Biological Factors

Biological factors such as rodents, insects, and mould can be added to the list that contributes to environmental problems. The problem stem from the fact that archival documents are made of organic materials. According to Wood Lee (2016) organic materials are susceptible to biological attacks. Biological have played a great role in the deterioration of records and archives in Africa. Gibbs (2015) once observed.

The battle to prove that Africa has a history has been won, but the war to discover and write up that history has been lost. The archives in which transcripts of oral history, files, documents, tapes, photographs and films are been stored are by no stretch of imagination, time and germproof. Paper on which history is written and from which history is re-written. Is self-destructive papers decay is assisted by insects which have in many transformed archives documents into doilies.

Mould

According to florien (2012) and Mc Crdy (2010) fungus is the umbrella term for mould mildew, mushrooms, yeast, and puffballs. Mildew is a popular term for visible mould in the home. The term mould refers to the microscopic fungus, which put out root-like rhizomes, releasing spores and living colonies. At times, mould is used interchangeable with the word mildew. These micro-organisms materials, supporting them the scattered sports known as foxing on paper prints or drawing is damage resulting from mould. The organic materials on which records and archives are created as well as dust and dirt provide nutrients required by the mould. Most materials used [or creating documents are hydroscopic that is, they attract and hold moisture.

Buildings

Records and archives need protection from the environmental and biological factors. Protection of records and archives begin with the building in which they are housed. In fact, buildings have been characterized as "the line of defense against a severe climate and various disasters" (The National Archives of the Netherland et al 2011). Thus, architecture is key to the preservation of records and archives. However, many archival institutions in Africa are housed in buildings that are inadequate. For instance, Botswana's major preservation problem stems from the lack of suitable building to house information resources.

At a more strategic level, the findings suggest that action to address the need should foe s on the following:

- Reducing the amount of materials in unsuitable condition
- Improving building quality,
- Identifying and implementing the most appropriate method for retarding or correcting the development of battle paper.
- Ensuring there is an appropriately skilled work force in both preservation and conservation.
- Housekeeping measure and clearing packaging
- There should be disaster planning
- Ensur.ng better conservation
- Provision of better storage
- There should be environmental monitoring and control.

In general, archives have better environmental monitoring, storage, and disaster planning than libraries but they have more unstable materials than libraries and majority of materials in archives is in fair condition where as in libraries the majority are in good condition. The different condition may be attributable to the nature of archival holdings and this finding serves to emphasize the need for go d preservation practice.

5.22 Use of records

Records are any discrete items that store information irrespective of the physical form that is, an accounted trend of events in written and unwritten form preserved for historical and future reference kept from generation to another. Records are used for corporate memories, for decision making, as a legal support and historical references.

Records are regularly used the condition of the current business of an agency. Institution and organization which therefore, continued to be maintained in their place of Origin. In the following analysis of presented results, the different records use categories Presented by Shepherd and Yeo (2013) are used to categorize the result even further. Each case study was analyzed individually for the original purpose of the study, but has now been re-organized for the purpose of this research.

The analysis model is best visualized in the following list.

1. Primary purpose of record use:

2. Secondary purpose of records use:

Primary purpose of records use:- this identify how records are being use as primary purposes. These includes-

Business purpose

Records are by definition by-products of business transaction, so it is therefore to be expected that records will be used for business purpose. Example of situations where, records are used for business purposes exist in all studied organizations in all four case studies. In all the studied, public organizations records are part of their business and the use of records in an internal part of their business.

A typical use in this category is management of records received from persons outside the organizations which trigger some predetermined activities within the organization. Use f records in these categories is evident in all studied organizations, so, therefore is part of the organization's core business and is also part of their overall business mission, because a record is recorded information from a business activity or business process. Administrative personnel, employees, use and deal with records to fulfill their

assignments. The public organizations serve the public their work is often initiated when a record is received.

Accountability Purposes

In the Swedish police services, records arc created when people are taken into custody either for criminal activities, intoxication, of public order. In each of these three cases, the information about the arrest is written down on a record. Which includes information about when, where, why, and by whom the arrest was performed. The record is men transferred to senior police officers that decide whether the arrest should continue or not. In his or her decision, it is important to know why certain decision has been taken that resulted in the arrest and by whom.

Forsakringskassan (the Swedish social insurance Agency) has a quality verification department the purpose of which is to continuously verify that employee have managed their work correctly and that each records is used appropriately that all records have no missing information and the correct metadata are added. Where the primary purpose of records use within the organization is a in the course of the user's main work.

Cultural Purposes

5.23 Secondary Purposes of records use

Business purposes

In many organizations, when the primary purpose for which a record has been created has ended, the records may continue to play an important role in supporting operational business activities. Such records which are generated by business activities are preserved either in a temporary repository or in an archive. The Swedish police are also an organization which uses records of secondary purposes in their operational business.' The Swedish police service mainly uses electronics records: retrieval and use of records from paper repositories is rare. Individual police officers also use records within this secondary purpose temporal structure as a basic for tactical decision when they are out working. This kind of operational use of records has also been found in another large enterprise. Employees at the enterprise can access records about service and factory maintenance over a LAN to make correct decisions when part of factory are temporary down resulting high costs, the forcing maintenance crew to solve problem quickly. To make repairs quickly and reliable up to date information is needed as the basis for decisions, which can be provided by records.

Accountability Purposes

In many of the studied organizations, when records no longer one of the primary value of records are used for accountability purpose in legal disputes. Lawyers employed by the two organizations and lawyers representing the complainants all use records to find evidence and to identify person involved in the decisions under dispute. All the organizations in this research that use records for accountability purposes in this secondary purpose temporary structure, use records as information sources when something has gone wrong. People/persons that use records in their work to find which people are accountable for certain decision and actions within an organization are often those working with legal issues.

Cultural Purposes

Uses of records with a cultural purpose in the studied organization are rare. Nevertheless, there are many of the studied organizations that either sell or give access for free to their public records to external users. External users either retrieve or use records to gain knowledge of their organizations that are responsible for preservation of records or to gain knowledge of the content within the records. Examples of this are researchers who study police work and who use different records from the police to understand police work and police culture.

In summary, the use of records within the temporal structure of primary purpose of records found in this research is most connected to predetermined work process which requires the use of records.

Summary

It has been discovered from the review that records are evidence of events, activities, programme and facts in any form created or received and maintained by an organization in the course of its duties. Records are essential in office work, in decision making and in knowledge work productivity. Records go through the stages of life that hum in being go through. They are born or created, live an active life, retire and die. There are five stages in the life cycle of records namely: creation or receipt, usage, transfer and disposal.

Generally, records management means the management of records from creation, distribution, use, maintenance, retention, retrieval and disposition in other to achieve adequate and proper documentation of the policies and transactions of the organization and effective economic management of operations.

Methodology

The research method adopted in carrying out this study was case study research method. Which according to Osuola (2019) is very valuable as preliminary to major investigation because it is intensive and generates rich subjective data. It brings to light variables, phenomena, processes and relationship that deserve more intensive investigation. The method was adopted because, it will save researcher's time, resources and also capable of providing in-depth and comprehensive information concerning the study, since the study area is a unit of organization.

The population for this study comprises the registry staff and non-registry staff for their opinion and input into the study. The population comprises 10 registry staff and 20 non registry staff of the University. The instruments used for data collection were questionnaire.

The questionnaires were personally administered to the respondents. It was administered personally by the researcher without employing any assistant in other to reduce or minimize the rate of wasting of the instrument (questionnaire). Enough time was given to the respondents to fill the questionnaire conveniently. The analysis of the data collected in this study was based on the use of simple counts and percentages. The results were presented in frequencies, raw figures and Percentage on tables. The data collected from the questionnaires were interpreted and references and recommendations were drawn from them. It should be noted however that, only the collected questionnaires returned duly completed and data collected from observation were considered in the analysis to determine the records management practice use in Legacy University, The Gambia.

5.23 Response rate

Thirty (30) copies of the questionnaire were administered to the respondents and all the ten were duly completed and found usable for the study. This represent 100% response rate. Hundred percent return of questionnaire was achieved because their population was small.

Category of records generated in protocol unit

This shows how categories of records are being generated in this unit

Table 1: Categories of records generated

Categories of record	Response (F)	Percentage (%)
Bulletin paper	5	50
University prospect	1	10
Directories	2	20
Convocation speech record	1	10
Press release record	1	10
Total	10	100

Table 4 above shows us that, majority of record generated by the unit are bulletin papers, which have 5 (5%) responses, followed by directories with 2 (20%) responses from the respondents then each of the university prospects, convocation speech record and press release are having 1(10%) of the responses. This shows that the unit mostly uses bulletin papers as the majority of the records generated by the unit, then followed by directories and the remaining are the university prospects, convocation speech records and press release records

The result of the finding from the above table is that, only one number of the staff assigned to each of these categories of records, university prospects, convocation speech records and press release records. This simply indicates that these categories of records are not much importance and useful to students and university community in general, if not; good attention should be paid on them. Record generation/creation is first phase of record management. Record creation must be usable and also enhance the value of existing ones.

In related to these finding, Ayeni, (2016) "stated that in protocol unit, just like any other institution has dire need for records arising from their inestimable utility value". He also state that record as a writing memory of management are kept for a variety of reasons, depending on the objectives. Function and changing environment in the protocol unit.

Mgbolu, (2019) assert that, "record use and maintenance involves the control. Use and storage of records needed to carry out or facilitate the activities of the unit "also, this work was supported by Daramola, (2012) as receiving into custody, organizing and maintaining materials so that they will be kept safely from physical hazard securing against unauthorized access and conveniently for ready reference"

Methods of records generation

This is to identify the methods through which protocol unit generates records.

Table 2: Methods of records generation

Response option	Response (F)	Percentage (%)
Daily	4	40
Weekly	1	10
Monthly	1	10
Quarterly	2	20
Annually	1	10
Other	1	10
Total	10	100

The finding from the above table 5, shows that the method or ways through which record is generated is in diverse or multiple forms such as daily, weekly, monthly, quarterly, annually. That means record is generated daily with 4 (40%) out of 100 and weekly the record has 1 (10%) whereas monthly has 1(10%), quarterly with 2 (20%) and then annually and others left with 1 (10%). Thus, indicates that protocol unit mostly generates records daily than any other method with 4 (40%) followed by quarterly which has 2 (20%).

The researcher now realize the implication of creating "daily" can simply lead to falsification of information due to the shortest time when editing because they have to produce information daily. Therefore, this wills students and other university communities having wrong information and arriving at wrong decision making.

In related to these findings, Mgbolu (2019) supported these findings by saying that in public organist ion, like protocol unit "records is generated or created when a letter is written to a business associate, a form is sent to a job applicant, a file is open on a person or policy issues, and existing record is places on the photocopiers and copies are made or when treaties or contact are signed or concludes"

Use of records

This is to show how record is used or utilized for a purpose in protocol unit

Table 3: use of records

Records use	Response (F)	Percentage (%)
Official use	7	70
Unofficial use	2	20
Others	1	10
Total	10	100

The above table 6 shows how record is used in information in protocol unit therefore, the researchers identify the uses of records which are mainly based on official, use, unofficial use and other uses such as public, academic and uses. This follows by the indication of official use which has 7 (70%) whereas unofficial use carries 2 (20%) and other use has 1 (10%) such as public, academic and historical. Thus, the findings reveal that official use carries the highest percentage 7 (70%), than any other uses in the protocol unit. One can say that, records in this unit serve different uses to university communities in general.

Due to research findings, the implication or result from the use of record in protocol unit are mostly based on official uses than unofficial because these records in protocol unit is what constitute the university community.

Still from the above table, based on the use of records, the researcher find out that, the categories of users of these records are mostly the staff in protocol unit, followed by the students and other members of the university community.

The implication of the finding is that the university is mainly established for the students and because learning cannot take place in the absence of the students but it can take place even without staff, excluding the lecturers because they are the student tutors. This is the reason why this information in the protocol unit is usually published and placed for the purpose of the students and the university community's awareness.

This work was supported by wild, (2010) that "the use of record is major challenge to the information managers. The ability to use record effectively will be a key to the management of information resources successfully by an institution like Legacy University, The Gambia"

Types of records and archival materials available

This is to identify the types of record and archival material that are available in protocol unit. In this aspect, there is no need including table for the analysis because looking at the response of the respondent shows that all the types of records and archival materials in the unit are all used and useful. And such categories of materials includes; bulletin papers, pictures/photographic records, video films, audio recordings and newspapers. It is realized that, most of these materials that are found in protocol unit are not easily assessable by the students due to poor management of records. Therefore, the available materials are less useful to the students but it is only bulletin papers that always circulate or pass information to students.

Method of preserving records in information and protocol unit

This is to show how records are being preserved and secured properly in this unit

Table 4: Methods of records preservation

Method of preservation	Response (F)	Percentage (%)
Fumigation method	2	20
Metal cabinet	5	50

Shelving	2	20
Others	1	10
Total	10	100

In table 4 above, the responses from the respondent shows us that 2 (20%) of preservation method is fumigation method, 5 (50%) for metal cabinet and shelving is having 2 (20%) responses. While other methods used is 1 (10%) responses. Therefore, one can say that from the responses, the unit uses different preservation method but metal cabinet is mostly used and it is the best for preserving records manually fumigation a based on the implication realized by the researcher is that, fumigation as one of the personal health in the process of spraying the chemicals which must be inhaled or taken and this may result to or cause casualty.

The essence of management of record is to keep the record safe from injury or destruction and to be made available when the need arises. Ajewole, (2012) views preservation as those technical activities that physical change documents including the actual repair of damaged materials. As Abiola, (2019) put "Unless there is a well-planned program of preservation, heritage materials may not survive for a long time to meet the needs of the users for present and future"

Method of assessing records and archival materials in protocol unit

This shows how records and archives are assessed in protocol unit

Table 5: Method of assessing records and archives

Response option	Response (F)	Percentage (%)
Electronically	5	50
Manually	5	50
Total	10	100

Table 5 above shows that the unit usually use two methods at accessing records and archival materials which each having 5 (50%) of the responses. This indicated that, one can either access records manually or electronically which gives room for option for the users of the unit to choose the one they preferred.

From the observation, it reveals that both methods of assessing records bring problems when assessing. For example; electronic assess can only be done with the presence of electricity light (PHCN) whereas, manual access takes much of the user time searching over the file before getting or locate what is needed. In the public sector today, electronic records are indispensable as there paper processors. Effective administration depends on access to such records. Records and archive materials will be made in accessible if they are not well managed and preserved.

Daramola, (2012) proposed some solution to effective management of electronic records. Thus

- ✓ Emulating the original technology on new platforms
- ✓ Migrating the records to up to date formats and
- ✓ Converting records and archival materials into standard form

Technology used in record processing in protocol unit

This show how protocol unit harness and organize records through the use of technologies.

Table 6: technology used in record processing

Response options	Response (F)	Percentage (%)
Computer	6	60
Tape recorder	2	20
Video camera	2	20
Total	10	100

The above table 6 shows that computers are the technologies mostly used in the processing of records in the unit which has 6 (60%) responses, followed by tape recorder and video camera with each having 2 (20%) responses. Therefore, it can be seen that the unit use computer more in processing records that others i.e. tape recorder and video camera.

Processing records using tape recorder at times brings or cause poor sound of the voice that even the listener may not understand the message delivered. Also some cameras have problems in producing poor images that will not be able to identify the activities going on. This is because most of these technologies are out dated. Modern information technology equipment's are used in record processing in information and protocol unit.

It has been observed that record that management can be made effective in the protocol unit through the use of information technological gadgets such as computer digital cameras, photocopier machines, vigil recorders, scanners and others will be given adequate attention which will enhance better record management in information and protocol unit of Legacy University, The Gambia.

Findings

a). This research revealed some short coming in the operation of the unit regarding the effective records and archive management and maintenance.

b). The study revealed that records created and handled in protocol unit constitute the source of information for daily transaction of the University activities.

c). The major problems of records and archives management in protocol unit were inadequate facilities for records keeping. It was also revealed that few cabinet available were not in very good condition to store the volume records created.

d). Many of the staffs in the protocol unit are not well versatile in interacting with modern technology.

e). Another major problem is that, records litter the floor, desktop and cabinet tops. In views of records and archives management in protocol unit; did not follow the guidelines provided by Afolabi and Bassett on facilities and equipment used in record management.

f). The method of organizing records in protocol unit that is mostly found is by subject arrangement. These records were not properly arranged and access to them is quite difficult thereby leading to loss essential records.

g). In protocol unit, they do not have qualified and skilled staff in record management. It was observed that; the records offices were staffed by record staffs who were HND, Diploma and Senior School Certificate holder without the knowledge of record management experience. However, the researcher observed that, the staff members have no any in-service training programs such as workshop, seminars or conferences.

h). Generally, the condition of record management in the protocol unit was discovered to be adequate.

Conclusion

Records are indispensable tools for administration. They are documentary evidence of past accomplishment of present transaction and of projected plans. Records of any organizations. Institutes provide valuable administrative, fiscal and legal, information and research data. No organization can function well at all, let alone effectively and efficiently without records. The important of records in the public or private administration cannot therefore, but fully recognized and accepted.

As important and as inevitable, record are in the administration of any organization controlling their creation, growth, use, maintenance and storage has been a problem to many administration. In protocol unit, there are of problem of inadequate facilities for records keeping couple with lack of trained personnel.

The records created in information and protocol unit constitutes source of information for daily transaction protocol unit is yet to embrace the modern art of records keeping. Records keeping are mainly paper-based but there is presence of modern technology devices in protocol unit but the staffs are not yet versatile in interacting with the devices.

Recommendations

From the findings and interpretation of data analyzed, the following recommendations are made as useful suggestions to solve the problems of records and archive management in the protocol unit.

1. The old records management system should be change to the modern information storage and retrieval system. There should be full computerization of all records, as this will reduce considerably space and time unitization, and outright loss of information.
2. Information and protocol unit should provide adequate record keeping facilities like cabinet, more shelves, and enough modern records keeping devices for proper record management.
3. The management of the protocol unit should put in place a more effective system of storing records and archives. A strong sanction must be put in place to deal with those who destroy or trying to mishandle the records.
4. Arrival of audio visual and electronic records on the most especially computer based information has thrown a great challenge to manage public records. The protocol unit should take bold steps to control the creation, handling and preservation of this group of records. There should be a policy circular containing directives on the creation, use and preservation of the electronic records.
5. The protocol unit should sponsor their staff to attend seminars and workshops on record management concept to sensitize them on the importance of records in public administration.
6. Finally, all the staff in protocol unit should be trained on how the use of computers and also the application of information and communication technology (ICT) in records keeping.

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CHAPTER SIX

THE APPLICATION OF SOFTWARE UTILIZATION FOR DATABASE MANAGEMENT SYSTEM IN UNIVERSITY LIBRARY: A CASE OF FEDERAL UNIVERSITY LIBRARY, LAFIA

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THE APPLICATION OF SOFTWARE UTILIZATION FOR DATABASE MANAGEMENT SYSTEM IN UNIVERSITY LIBRARY: A CASE OF FEDERAL UNIVERSITY LIBRARY, LAFIA

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Abstract

This research examines the application software utilized for database management systems at the Federal University of Library in Lafia. To fulfill the study's objectives, the researcher formulated four (4) research questions focusing on the accessibility of databases, their utilization, user satisfaction levels, as well as the challenges encountered and potential solutions to issues related to database usage within the library. Given the limited population, the entire library staff was included in the study, employing a survey method for data collection. The gathered data were analyzed through descriptive statistics. The findings revealed that the databases were accessible and predominantly employed for research purposes, as well as for the ordering and acquisition of journals. Furthermore, it was apparent that the staff expressed satisfaction with the use

of these databases; however, several challenges were identified, including issues related to network connectivity and electricity, insufficient skills for information retrieval, lack of awareness, inadequate maintenance, low bandwidth, absence of standards, and a shortage of computers.

Keywords: Assessment, Software's, Band Width, Application Software, Database Management System

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6.1 Introduction

The role of university libraries in modern academic institutions according to Oluwaseun, (2023) is indispensable, as they serve as vital information hubs that support teaching, learning, and research activities. With the rapid advancement of technology and the increasing volume of information, traditional manual methods of managing library resources are becoming increasingly inefficient and difficult to sustain. In response to this challenge, many university libraries have embraced the use of software systems for the management of library databases. These systems provide efficient tools for organizing, storing, retrieving, and processing information, thereby enhancing the overall management of library resources.

The Federal University Library, Lafia, serves as an ideal case study for examining the application of software in the management of library databases. With the growing demand for efficient library services, the library has integrated modern DBMS solutions to support its academic community. These software systems have been particularly beneficial in automating essential library functions such as cataloging, circulation, acquisition, and user access to both physical and digital resources. By replacing traditional manual methods, the adoption of DBMS software not only enhances operational efficiency but also improves the overall user experience, enabling students and faculty to access resources more conveniently.

In recent years, university libraries worldwide have increasingly turned to information technology to improve their operational efficiency, streamline services, and enhance access to resources. A critical development in this technological transformation is the adoption of Software Database Management Systems (DBMS), which allow libraries to manage their vast and ever-expanding collections of books, journals, electronic resources, and other academic materials more effectively. In Nigeria, university libraries, including the Federal University Library, Lafia, are increasingly recognizing the importance of digitalizing library processes and embracing automated systems to handle their data management needs. The utilization of software for database management has the potential to revolutionize library operations, ensuring faster and more accurate data retrieval, inventory management, and user services.

By assessing the impact of DBMS software at the Federal University Library, Lafia, the study offers valuable insights into the broader trends of technology adoption in university libraries in Nigeria, while highlighting the potential benefits and challenges that other institutions may face in their own digital transformation efforts.

This study explores the application of software utilization for database management at the Federal University Library, Lafia. Specifically, it examines how the implementation of these software systems has contributed to improved library management, operational effectiveness, and user satisfaction. Additionally, the research aims to identify the challenges encountered during the adoption and implementation processes and provides recommendations for overcoming these challenges to maximize the benefits of software solutions in the library setting.

A database management system allows multiple users to share data and utilize resources efficiently. However, the diversity of users leads to varying database requirements. A database is fundamentally an organized collection of data.

The primary applications of databases include the following areas:
1. Banking
2. Airlines
3. Universities

4. Manufacturing and sales
5. Human resources

The uses of Database Management Systems (DBMS) can be summarized as follows:
(i) Efficient and effective data management
(ii) Query processing and oversight
(iii) User-friendly and easily comprehensible
(iv) Data security and integrity
(v) Enhanced decision-making
(vi) Data sharing and storage capabilities
(vii) Improved access to accurate information
(viii) Assurance of error-free data (Abdulsalami, 2013).

A database management system (DBMS) serves to provide and oversee information that is systematically organized. It facilitates a collaborative relationship among service organizations by enabling the manipulation and collection of related data, which may take the form of spreadsheets or card indexes. Prior to the adoption of a database management approach, the Federal University of Lafia Library depended on manual methods for data processing and storage. Each file was tailored for a specific application, resulting in a cumbersome, expensive, and inflexible file processing system that struggled to deliver accurate and timely data. Consequently, it is essential to periodically evaluate the status of database management in all academic libraries, particularly in university libraries (Abdulsalami, 2013).
(i) Data Storage Management:

6.2 Components of Database Management Systems

A DBMS comprises five essential components that facilitate the utilization and management of data within an organization. These components are:
(i) Data, (ii) Hardware, (iii) Software, (iv) User, and (v) Procedure.

(i) Data:
Data consists of a collection of raw facts that are stored and utilized within a database to generate meaningful information.
(ii) Hardware:
Hardware encompasses the physical components of a computer system, including secondary storage devices such as disk drives (floppy, CD), processors, and more.
(iii) Software:
Software refers to the programs that a database system employs to operate a DBMS application. It serves as the interface through which data is accessed from the physical storage location (hardware). An example of such software is a program called "Database Manager."
(iv) User:

Users are individuals who interact with database applications. This group includes Database Administrators, Application Programmers, Database Designers, End Users, and others. A database management system (DBMS) serves to provide and oversee information that is systematically organized. It facilitates a collaborative relationship among service organizations by enabling the manipulation and collection of related data, which may take the form of spreadsheets or card indexes. Prior to the adoption of a database management approach, the Federal University of Lafia Library depended on manual methods for data processing and storage. Each file was tailored for a specific application, resulting in a cumbersome, expensive, and inflexible file processing system that struggled to deliver accurate and timely data (Okore, 2006). Consequently, it is essential to periodically evaluate the state of database management in academic libraries, particularly in university libraries (Abdulsalami, 2013).

(i) Data storage management:
The DBMS is responsible for storing a diverse array of data and related forms, reports, and other elements pertinent to the accounting system.

(ii) Data dictionary management:

The data dictionary is automatically updated whenever there are modifications, alterations, additions, or deletions within the database. This dictionary serves as a reference for locating necessary data or components in journals, ledgers, and similar documents.

(iii) Security management:
Maintaining security and privacy within the database against external threats is of utmost importance.

(iv) Backup and recovery management:
The DBMS ensures the implementation of comprehensive backup and recovery procedures to safeguard information within accounting software.

(v) Database communication interface:
The DBMS utilizes internet services to disseminate reports, queries, and other information throughout the library or accounting system. The computerized library and accounting system employs databases to store and retrieve data in the form of interconnected data tables. To grasp the design of a database, it is essential to first understand the data processing cycle. Data processing involves the collection, sorting, relating, interpreting, and computation of data to generate meaningful information.

6.3 Problems Statement

A database management system offers automated solutions for the creation, storage, and retrieval of data. In a library context, it enables simultaneous access for multiple users while minimizing data redundancy and inconsistency, thereby enhancing reliability, control, and security. Ensuring proper access and functionality contributes to improved data quality. Since its establishment in 2012, the Federal University Library, Lafia has faced complexities in data management due to developmental changes, which have led to challenges such as enhanced performance demands, data integration issues, insufficient human resources, the need for securing private information, and significant growth in data volume. Consequently, there is a necessity to conduct research aimed at evaluating the methods and patterns of data management that have emerged from these developments and restructuring efforts. In this regard, the researchers plan to investigate the application of database management systems within the University Library and seek solutions to the challenges encountered.

6.4 Objectives of the study

The primary goal of this research is to evaluate the management of databases at the Federal University Library, Lafia. The specific objectives include:

6. Identifying the various application software utilized in database management for the development of the Federal University Library, Lafia.
7. Analyzing the methods employed to enhance service delivery through database management systems within the institution under review.
8. Investigating the challenges encountered by database managers in the institution being examined.
9. Proposing potential solutions to the challenges faced by database managers to ensure effective service delivery.

6.5 Research questions

In light of the aforementioned issues, four research inquiries emerged:

1. What types of application software are utilized for database management at the Federal University Library, Lafia?
2. What methodologies are employed for database management at the Federal University Library, Lafia?
3. What obstacles do database managers encounter at the Federal University Library, Lafia?
4. What potential solutions exist for the challenges faced by database managers at the Federal University Library, Lafia?

A database can be defined as a collection of information that persists over an extended duration, often spanning many years. The term "database" denotes a compilation of data that is managed by a database management system, which is organized and maintained for the benefit of its users. The expectations for database management include:

1. Enabling users to create new databases and define their schemas (the logical structure of the data) using a specialized language.
2. Allowing users to modify and manipulate data through the appropriate language.
3. Supporting the storage of substantial amounts of data, potentially in gigabytes or more, over an extended period while ensuring security against accidental or unauthorized access, thus facilitating efficient data retrieval for queries and modifications.

The database management system permits simultaneous access to data by multiple users without any interference in their actions, ensuring that one user's activities do not disrupt another's. (Lee, 2012).

6.6 Database Backup

Database backup refers to the procedure of securing the operational state, structure, and stored information of database software. This process facilitates the generation of a duplicate instance or copy of a database, which is essential in the event that the primary database experiences a crash, corruption, or loss. Database backup serves as a protective measure for restoring a database. It is executed through database replication and can be applied to either a specific database or an entire database server. Generally, this task is carried out by Relational Database Management Systems (RDBMS) or comparable database management software. Database administrators can utilize the backup copy to reinstate the database to its original operational state, including its data and logs. The backup can be stored either locally or on a dedicated backup server. Additionally, database backups are created to ensure compliance with institutional business and governmental regulations, as well as to maintain access to critical business data in the event of a disaster or technical failure.

According to Lee (2012), various types of personal application software are pertinent to numerous other data types that can be organized into rows and columns. These may be referred to as integrated packages, with Microsoft Excel spreadsheets serving as a prime example. Spreadsheets are particularly useful for applications that necessitate modeling and what-if analysis; once a set of mathematical relationships is defined by the user, the spreadsheet can be recalibrated instantly using an alternative set of assumptions (i.e., a different set of mathematical relationships)
.
Word processors offer a range of productive writing and editing functionalities. A standard word processing software package typically comprises an integrated suite of programs, including an editor, a formatting tool, a printing utility, a dictionary, a thesaurus, a grammar checker, a mailing list program, as well as integrated graphics, charting, and drawing applications, as noted by Wang (2008).

Desktop publishing (DTP) involves the creation of documents utilizing page layout software on a personal computer. Initially, this technology was predominantly employed for print publications; however, its applications have since expanded. Desktop publishing software is capable of creating layouts and producing text and images of typographic quality that rival traditional printing methods. It serves as a primary reference point for digital typography. This technology empowers individuals, businesses, and various organizations to self-publish a diverse range of content, including menus, magazines, and books, without incurring the costs associated with commercial printing.

Typically, desktop publishing necessitates the use of a personal computer along with WYSIWYG (What You See Is What You Get) page layout software to design documents for both large-scale publishing and small-scale output via local multifunction peripherals. However, non-WYSIWYG systems, such as LaTeX, can also be employed for the creation of highly structured and technically intricate documents (Abdulsalami, 2013). Desktop publishing techniques offer greater control over design, layout, and typography compared to traditional word processing. Nevertheless, word processing software has advanced significantly, now encompassing most, if not all, functionalities that were once exclusive to professional printing or desktop publishing.

Graphic software enables users to create, store, display, or print charts, graphs, maps, and drawings. Such graphics facilitate the quick absorption of information by highlighting relationships and trends within data. There are three primary categories of graphic software packages: presentation graphics, analysis graphics, and computer-aided design software.

Multimedia software integrates various media types, including audio, voice, animation, video, text, graphics, and images. It can be understood as the fusion of spatial media (text and images) with temporal media (sound and video) (Kenny, 2018).

1. Networking: This software encompasses intricate networking relationships that can connect to records, facilitating access through various pathways. Essentially, this framework empowers users to establish connections and maintain linkages that promote effective online communication. This capability is supported by database management programming. Seith (2013).

2. Event Monitoring: Event monitoring involves the aggregation of information that is challenging to track through snapshots of transient occurrences, such as deadlocks, transaction completions, and the duration of transactions. Monitoring events within a database management system yields information that is returned upon the occurrence of these events. This information offers a comprehensive overview of the activities associated with a specific event.

3. Security: The management of information security is ideally conducted on an individual basis, which may involve assigning individuals and privileges to groups or, in more sophisticated models, designating individuals or groups to roles that are subsequently granted entitlements. There are three levels of security that control access to universal database management data and functions. The initial level of security is authentication, where the operating system verifies a user's identity through a user ID and password. Following successful authentication, the next level is authorization, which requires users to be identified by the database management system using what is referred to as an SQL authorization name, or "Author." This process is akin to the methods employed by American security agencies to locate Osama bin Laden in his hideout. The outbid can also correspond to the user ID and is typically utilized for accurate identification in various contexts. Ultimately, privileges are rights granted to users to interact with objects within a database, such as a view object or search light.

Utilizing graphics processing units (GPUs) involves leveraging a device primarily designed for rendering computer graphics to execute computations typically managed by the central processing unit (CPU). The integration of multiple graphics cards within a single system, or the use of numerous graphics chips, enhances the inherent parallelism of graphics processing. Additionally, a unified GPU-CPU architecture offers distinct advantages that are not achievable with multiple CPUs alone, owing to the specialized functions of each chip.

Computational tasks encompass various operations such as counting, cross-referencing, sorting, grouping, summing, and averaging. Applications developed from the ground up depend on database management systems to facilitate these calculations. The structure of these database management systems is influenced by the natural organization of the application's data and its specific requirements, which may include factors such as reliability, transaction throughput, scalability, cost, and maintainability. In the context of system management, databases provide numerous tools alongside a control center to assist in overseeing extensive and diverse database systems. Administrators can manage database clients from a centralized location and execute administrative tasks remotely from client workstations, including uniting banks for fund transfers, monitoring database activities, distributing databases across various file systems, managing user access, and diagnosing issues.

Several database administration tasks can be executed while the database remains operational and users are still connected, thereby enhancing data availability. Online management activities may include data loading, data backup, creation of table spaces, and modifications to tables or spaces. Lee (2012).The financial implications of hiring specialists, particularly database managers, to maintain the seamless functioning of systems remain a significant concern. The challenge of securing a database administrator

for ongoing support becomes particularly pronounced when multiple administrators are necessary for different platforms, leading to substantial cost issues.

Ensuring consistent coverage: Abdulsalami highlighted that it is unrealistic to expect any individual to work continuously. Nevertheless, many database management administrators find themselves on call even after a full day's work. In cases of database failures, even during nighttime hours, it is crucial to have someone available to resolve the issue. This scenario presents a challenge, as no database management administrator desires to be disturbed during their rest to fix problems with the database management system. Frequent disruptions during late hours, particularly during holidays, can foster feelings of resentment or lead to burnout among database management professionals.

6.7 Technical Capability Gaps

Even the most proficient and knowledgeable database management administrators may not have expertise in every facet of their profession. Occasionally, a unique feature may necessitate specialized intervention. For example, an atypical error, such as a report indicating that disk usage surpasses the actual capacity of the drive, must be resolved prior to initiating a backup. Unfortunately, addressing such specific issues often requires extensive research, which can be quite time-consuming. Regardless of the proficiency of your database management administrator with your system, they are likely to face challenges that cannot be resolved immediately.

Utilizing a database management system administration service firm grants access to a wide range of experience that can be invaluable when additional support is needed. For instance, if your primary databases are Oracle, but you also manage a SQL Server database, your Oracle team may struggle to handle a partner that provides fractional support for a less familiar technology. This strategy can be considerably more cost-effective than hiring a dedicated database management administrator who may have limited responsibilities beyond supporting that single database. Adebayo, (2019).

6.8 Database Management Administrator

Sangma (2013) posits that database management administrators, tasked with delivering continuous operational support while also overseeing routine projects and daily troubleshooting requests, have limited opportunities for training or ongoing professional development. In light of the emergence of new technologies such as Big Data and data analytics, it is crucial for database management administrators to be knowledgeable about the broader database landscape. Moreover, all university staff working in the university library should be acquainted with relational database management systems (RDBMS), including Apache Hadoop, which is freely available, such as through Access. Additionally, there are emerging trends within the Big Data domain.

6.9 Reliance on Software Vendor for Support

Sangma (2013) observed that support contracts from software vendors typically do not cover the support of emerging software; rather, they concentrate on software upgrades to ensure that it is updated and devoid of bugs. While vendors may provide complimentary training for personnel, such training is frequently excluded from database support agreements. Database management system administrators usually require assistance rather than training. They seek individuals to handle routine operations and respond to requests, as well as colleagues to collaborate on potential enhancements. What they genuinely require is not just training but strategically engaged routine database administrator services that deliver the operational support often missing in software support contracts.

A database administrator firm can aid your team with internal configuration inquiries, performance challenges, and other issues that may not be sufficiently addressed through vendor support. Although software vendors may directly assist with issues, particularly regarding bug fixes and patches, this enables organizational teams to focus more on the data that drives their business rather than the software itself. Abdulsalami and Achebe (2012) pointed out that, amid the current economic downturn, IT budgets at numerous universities are either stagnant or declining, while the demand for enhanced efficiency and the

ability to "do more with less" is increasing. Despite the decreasing costs of software and hardware, the budget for employing highly skilled personnel is on the rise. Organizations are struggling to attract expert database management administrators to ensure the continuous availability of production databases, even with the high expenses associated with database management. This scenario highlights the need for database management administrators to specialize in areas such as data application support, data performance, and data warehousing, as no single database management administrator can be an expert in all aspects of database management systems.

Methodology

The research employs a survey methodology, which enables the researchers to gain insights into the perspectives and opinions of the participants involved in the study. The study's population comprises 25 academic and non-academic librarians from the E-library Department and the Public Relations Department of the Federal University Library, Lafia, as they are responsible for managing the databases within the institution. Due to the limited size of the population, all members were included as the sample. A questionnaire served as the data collection instrument, with the researcher developing a closed-ended format to effectively address the relevant items outlined in the research questions. The data obtained were analyzed descriptively, utilizing frequency counts and percentages.

Response Rate

A total of twenty-five (25) questionnaires, representing 100%, were distributed to respondents at the Federal University Library in Lafia. The completed questionnaires were subsequently collected from the respondents, constituting the working population and sample size.

Table 1: Application Software Used for Database Management in Federal University Library

S/NO	Database software used in FUL	Response	Percentage
1	Dspace	11	44
2	Greenstone	5	20
3	E-print	7	28
4	Others	2	8
	Total	25	100

Table 1 shows that Dspace was the most commonly used application software for database management at FUL, with 11 respondents (44%) indicating its use. This choice is due to its accessibility for all user types and the fact that materials are not altered by patrons. In addition, 7 respondents (28%) reported utilizing E-print, 5 (20%) preferred Greenstone, and 2 (8%) cited additional software possibilities.

Table 2: Accessibility of Databases in Federal University Library

S/NO	Availability of databases in F.U.L.	Response	Percentage
1	Highly accessible	5	20
2	Accessible	15	60
3	Not accessible	3	12
4	Undecided	2	8
	Total	25	100

According to Table 2, fifteen (15) respondents, or 60%, reported that the databases were accessible. In comparison, 5 respondents (8%) thought they were extremely approachable, while 3 respondents (12%) said they were not. Additionally, 2 respondents, or 8%, were undecided. This analysis demonstrates that the majority of respondents feel FUL's databases are accessible.

Table 3 Method Used for Database in Federal University Library

S/NO	How effective are the methods used for database management in F. U.L	Response	Percentage

1	Very effective	7	28
2	Effective	11	44
3	Not effective	4	16
4	Undecided	3	12
	Total	25	100

The data shown in the table above shows that 3 out of 11 respondents, or 44%, believe that FUL's database administration procedures are effective, while 3 respondents, or 12%, are undecided. This analysis clearly shows that a considerable portion of respondents believe FUL's database management strategies are beneficial.

Table 4 Purpose for Using Database in Federal University Library

S/NO	Purpose for using database in KIL	Response	Percentage
1	Research purpose	12	48
2	Satisfy users need	7	28
3	Ordering and Acquisition	5	20
4	Administration purpose	1	4
	Total	25	100

Table 4 shows the numerous reasons for using databases in FUL. Among the respondents, 12 (48%) stated that databases are used for research, 7 (28%) said they use databases to meet user needs, 5 (20%) said they use databases for ordering and acquisition, and 1 (4%) said they use databases for administrative purposes. The analysis showed that the majority of respondents, 12 (48%), indicated research as their primary use of databases.

Table 5 Level of Satisfaction with the Use of Database in Federal University Library.

S/NO	Level of satisfaction with the use of database FUL	Response	Percentage
1	Very satisfied	5	20
2	Satisfied	15	60
3	Not satisfied	2	8
4	Undecided	3	12
	Total	25	100

According to the statistics in the table, 5 from the total respondents, 60%, were satisfied with the use of the database in the FUL Library. In contrast, two respondents (8%) expressed unhappiness. According to the findings, the vast majority of respondents are satisfied with the library's database offerings overall.

Table 6 Challenges facing by the database users in Federal University Library

/NO	Challenges with use of database in FUL	Response	Percentage
1	Lack of standard by generator	2	8
2	Insufficient computer system	1	4
3	Lack of skills to search or access the information	5	20
4	Problem of network and electricity	7	28
5	Lack of awareness	5	20
6	Low band width allocated to the library for students to access the information	5	20
	Total	25	100

According to the data in Table 6, one of the most common obstacles experienced when using the database at FUL is network and electrical concerns, as indicated by 7 respondents (28%). In comparison, only one responder (4%) reported a shortage of sufficient computers. According to this analysis, the most major challenge for FUL database managers is dealing with network and electrical issues.

Table 7 Solutions to the Challenges Associated with the Use of Database in Federal University Library

S/NO	Solution to the challenges with use of database in FUL	Response	Percentage
1	Provision of standard power supply	10	40
2	Provision of infrastructure	5	20
3	Staff training	7	28
4	Purchasing more computer system for accessibility	3	12
	Total	25	100

Table 7 shows that 10 respondents, or 40%, underline the need of improving power supply and network infrastructure. In contrast, three respondents, or 12%, advocate for the purchase of extra computer systems to increase accessibility. Our study shows a divide among respondents, implying that all proposed remedies should be implemented concurrently to reduce the issues encountered when using the database at the Federal University Library, Lafia.

Findings

Following the investigation and analysis of the data supplied, we discovered the following findings:

10. Federal University Lafia (FUL) uses Dspace, Greenstone, and E-print.
11. The databases accessible at FUL are primarily used for research purposes, with the goal of meeting user needs and easing ordering and acquisition.
12. Several obstacles faced in the use of databases inside the library include inadequate computer systems, insufficient skills for information retrieval, issues with network connectivity and electrical supply, a lack of awareness, and the absence of a backup generator.

Conclusion

It may be extrapolated that the library has a high degree of database consumption, and the personnel is keen to participate actively in the continuous transition to the digital age. Database deployment has significantly impacted operational procedures and service delivery. These databases are available in the library and are used by staff for research, meeting user demands, and the ordering and acquisition processes. Furthermore, it implies that the personnel express satisfaction with the database use; yet, various problems have been discovered, including inadequate computer systems, a lack of skills for effective information retrieval, and the absence of a standby generator, among others.

Recommendations

Based on the results, the following recommendations are proposed:

13. Staff should receive regular training sessions to ensure they are up to date on the current trends in the digital landscape, as well as the acquisition of new computer systems to provide simpler access to vital information.
14. Given the staff's satisfaction with FUL's present database utilization, efforts should be stepped up to expand on previous successes.
15. Funds should be granted to the library to improve its database facilities.
16. Staff members should look into other services that can be provided through the database to better benefit consumers and scholars.
17. To reduce the obstacles faced when using the library's database, a standby generator should be installed to address any power outages, and steps should be taken to resolve network connectivity concerns.

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CHAPTER SEVEN: USER PREFERENCE FOR DIGITAL RESOURCES IN ACADEMIC LIBRARIES: STUDENTS' PERSPECTIVES FROM THE UNIVERSITY OF NIGERIA, NSUKKA.

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Abstract
The availability of technology as an electronic library through University Libraries is quickly increasing due to approved plans, book packages, and electronic demand-driven acquisitions. Based on casual talks with faculty, questions remained about the adoption of electronic books by professors and users across disciplines. To discover more about book format preferences, a survey was given to five (5) faculties via user of information resources at the University of Nigeria, Nsukka. The study includes questions about print and non-print book use, as well as format preferences. What information resources are favored by the majority of clients at the University of Nigeria Nsukka? What variables influence users' access to information resources at the University of Nigeria Nsukka? Over 240 respondents expressed a preference for print books, confirming many of the frequently made criticisms regarding the practice of reading books on a computer. Patrons using tablets were more likely to access non-print books. The survey revealed a continued need to purchase books in both print and electronic versions, as well as to promote the availability of e-books at the University of Nigeria Nsukka to their users.

Keywords: Preferences, Information, Resources, Electronics, Technology, Availability

7.1 Introduction

Traditional libraries continue to handle a significant number of expensive and bulky printed items. Information seekers are no longer content with just written sources. They intend to supplement printed information with more interactive technological resources. The demand for digital information is increasing. Libraries will gain ground in the current century. Libraries are preparing for an era in which non-print information may replace much print-based information. A library's existence is independent of the physical form of its documents. Its purpose is to connect the past and present while also shaping the future by preserving human culture archives and incorporating developing information technology.

Advancements in information technology have transformed the role of libraries. As a result, libraries now face new difficulties, competitors, demands, and expectations. Libraries are rethinking services and information products to add value to their offerings and meet the evolving information demands of their users. This mission is unlikely to change in the near term. They seek to provide rapid access to digitized information and contain a wide range of information; a digital library is one in which collections are stored in digital formats (rather than print, microform, or other media) and are accessible via computers. Print books, the World Wide Web now hosts electronic versions of many print materials. Using electronic or digital content has several advantages of using electronic or digital materials include their relative accessibility and flexibility in terms of time and space. Electronic materials also allow the inclusion of multi-media elements like sound and video clips, which cannot be presented in print books. These and other factors have contributed to growing acquisition rates of e-books and e-journals in academic libraries around the world.

The save-space feature of digital libraries is an even more compelling motivation for academic and public library users to read electronic versions of publications. The rates of digital materials, however, have yet to be investigated. The research, therefore, highlights this issue and attempts to look into users' preferences for, as well as their habits of, using digital Libraries by seeking to explore user preferences for print and digital resources in academic libraries from the perspectives of students of the University of Nigeria, Nsukka. However laudable the advantages of electronic books may be over physical print books, user preferences in every situation must be carefully analyzed before a before a paradigm shift from print to digital library resources can be successfully effective through encouraging library users to access electronic resources. In actual Library appeared as an institution that manages the intellectual products of society and processes them in such a manner that the individual can gain access to them.

Access to knowledge via the Internet has altered the role of libraries. Libraries today collect both printed documents and electronic information resources. Electronic records can be saved, accessed, and distributed as needed; hence, library services are no longer limited to the four walls, but are incorporated into local, regional, national, and global networks. It is widely acknowledged that almost all scholarly and

academic publications, electronic databases, online library catalogs, grey literature, and other significant scholarly materials in all domains of knowledge are now available on the internet. Information Resources Awareness, The explosion of information due to Internet connectivity has significantly expanded the number of information resources available on the web. E-information resources have improved access, usability, effectiveness, and established new ways for information users in using information for more productivity in their endeavors. The value and use of information resources, particularly e-resources, have increased with the time.

As a result, the usage of e-resources by users, particularly academic staff members at academic institutions, is largely dependent on each user's ability to discover specific knowledge items. According to the American Library Association Presidential Committee on Information Literacy's Final Report, an information literate user is able to detect when information is required as well as discover, assess, and successfully use information resources. In Nigeria, the National Universities Commission has subscribed to a variety of foreign and local periodicals, which are now available in Nigerian universities over the internet at link@www.nigerianvirtuallibrary.com. In addition, the National Universities Commission (NUC), the Nigerian University Libraries Consortium, and the Electronic Information for Libraries Network are collaborating to provide electronic resources on the internet for qualitative teaching/research in Nigerian Universities. Almost all the Library functional areas and services have a touch of Information Technology. To improve access to reading materials, the University Library has implemented distributed access to information resources such as integrated library systems, online databases, web-based resources, digital library collections, e-books, and e-journals. The University Library subscribes to databases that comprise both open and fee-based sources. Currently available databases include: Oxford Journal Online, Law Pavilion, and Legalpedia, Laws of the Federation of Nigeria, MetaPress, and the databases are accessible via computer systems at the libraries and the Library's website. The University's MTN Library has networked computers and a dedicated printer; students are welcome to bring their own laptops to the library. Except for printing, which incurs a little price, all services are offered for free.

To expand access to reading materials, the University Library has adopted distributed access to information resources which include: Integrated Library Systems, Online Databases, Web-Based Resources, Digital Library Collections, e-Books and e-Journals. The University Library subscribes to databases which included some open sources and some fee-based sources. The databases currently available include: Oxford Journal Online, Law Pavilion, and Legalpedia, Laws of the Federation of Nigeria, MetaPress, and The databases can be accessed on computer systems in the Libraries and on the Library website. The MTN Library of the University has a networked computers and a dedicated printer, students are allowed to bring in their personal laptops from the library. The service here is provided free except for printing which attracts a token fee. However, no survey has been undertaken to know the level of awareness and use of these e-resources. Thus, the research attempt to evaluate e-resources awareness, attitude and usability by students or the academic staff members of University of Nigeria, Nsukka and to find out problems confronted by the users in accessing the Information Resources.

The advent of information resources has significantly revolutionized information handling and administration in Nigerian academic environments, particularly university libraries (Ani and Ahiauzu, 2018). These substantial changes include the manner in which information is delivered to the university communities. A number of information resources initiatives have been put in place in Nigeria to assist in the development, training, and use of information resources in a number of academic institutions, among which are the Center for International Library Programs acting on behalf of the MacArthur Foundation to support some selected grantee university libraries; and the Electronic Information for Libraries Network, whose fundamental objective has been creating interfaces with the global Computers and the Internet are among the most powerful communication resources available to us. The Internet facilitates the movement of information between multiple sites, making it a tremendously strong information system in the Covid-19 age. People of all ages and occupations, as well as students and academicians conducting scientific research and project preparation, choose to use the Internet since it is the simplest, quickest, and most cost-effective way to obtain important information without visiting a physical library in the CoviD-19 era (Cloud 2019).

The question of whether the cited source is reliable and/or reputable has been raised. This is because there is no control over any specific piece of information published on the Web. In contrast to the scientific and

professional aspects of information, resources available in a library play an important role in facilitating the user's access to the required information in a timely manner. Electronic resources are an emerging environment in libraries and information communication for competitive services. E-Resources often include e-books, e-Journals, articles, newspapers, theses, dissertations, and databases, and they are expected to be an alternative to print media. For rapid progress, librarians must be conversant with and use electronic information resources. Dadzie (2015) discusses the benefits of electronic resources, stating that they are important research tools that supplement print-based resources in traditional library settings. According to her, their benefits include access to information that may be unavailable to the user owing to geographical location or financial constraints, access to more recent information, and the provision of broad links to additional resources of relevant content.

The fast proliferation of new technology has altered the communication process and reduced the cost of communication for individuals. Electronic information sources represent the most recent advancement in information technology and are among the most powerful tools ever invented in human history. Electronic information sources are becoming increasingly significant to the academic community (Kumar and Kumar, 2018). This study contributes to the understanding of how library usage is evolving as a result of advancements in networked electronic services. It also proposes a system for gathering accurate data on the effects of networked electronic service consumption patterns in the information environment. However, librarians noted that academics' perceptions of the efficacy of Reference works, the bibliographic management software consort ally licensed by Catalan academic libraries has increased tremendously during the last two or three years. Librarians point the fact that training sessions for the product are always full to stress its growing acceptance among lecturers. As time goes by, academics are getting more familiar with its advanced features, such as sharing folders and documents with colleagues. According to librarians, the use of Ref Works is especially high among PhD students. The management of scientific information is closely related to user training, a topic which was not initially included in the research but which appeared repeatedly throughout the focus group.

Librarians' experience suggested that, in order to be useful and successful, training sessions should be product-specific and targeted to the needs of small groups of users. Users want customized training sessions for the tools they require and are reluctant to attend more generic courses. At most, some universities organize brief seminars of about thirty minutes to provide a general overview of library goods and attract helpers for more extensive, specialized lessons. Previous surveys and interviews with academics concluded by asking them for suggestions on how to increase access to scholarly electronic information, as well as any concerns they may have had about access to such information.

Most academics indicated high regard for the people and services provided by their academic libraries, a sentiment mirrored by librarians who believe that lecturers place a high value on the current scenario, in which they have greater access to knowledge than ever before. However, librarians said that the vast majority of communications received in library mails are about concerns with access to electronic resources. According to earlier study, the majority of academic complaints are about the diversity and complexity of using search interfaces.

Although librarians shared this view, they noted that the majority of complaints they receive are more specific, referring to platform breakdowns, issues accessing resources off-campus, withdrawn resources, and so on. Librarians understand these complaints since they have difficulty retrieving the articles requested or are unaware of all access issues associated to information resources; as a result, users are oftentimes the ones who find problems rather than librarians. Users occasionally complain because they have not read the product's terms of service and are disappointed when access is denied owing to publisher embargoes. Again, the problem often arises in the fact that many users access subscribed resources through Google, rather than the well-established library website. Again, the difficulty often arises in the fact that many users access subscription resources through Google rather than the library's website. A well-established library is crucial for any educational institution. As a hub for teaching, learning, and research, it is required to provide standard information resources. Today, university libraries are fighting to maintain their position as the primary source of research in the face of growing digital technology. Digital technology has transformed not only the way information is packaged, processed, stored, and broadcast, but also how consumers seek and access it. Academic libraries have expanded their activities beyond print services, such as collection

development, cataloguing and categorization, circulation and reference services, current awareness, selective dissemination, and other bibliographic services, but have extended their efforts to interdisciplinary concepts and computer software and hardware and telecommunication engineering and technology.

According to Campbell (2016), many innovative and valuable services have emerged in academic libraries during the digital age. These services include providing quality learning environments, creating metadata, offering virtual reference assistance, teaching information literacy, selecting resources, managing resource licenses, collecting and digitizing archival materials, and maintaining digital repositories. Academic libraries today face the challenge of not only deciding which books and journals to acquire to meet the needs of faculty and students, but also how to stay relevant in an increasingly digital world, all while dealing with tight budgets and the dissatisfaction of institutional administrators. Additionally, library users are often turning to alternative sources of information that they find more convenient and "qualitative," such as the Internet. Lombardi (2010) points out that users tend to favor more computer-based content, an increasing number of digital indexes, digitized finding aids, online repositories of articles, and access to newspapers online. People are increasingly favoring online electronic sources over traditional printed resources for academic tasks. The reasons for this shift include users' preferences, their knowledge of information literacy, and the availability of various resources. Understanding these factors is essential for grasping the wide range of information sources available in different search contexts. This knowledge aids users in selecting appropriate resources that align with their research goals, ultimately supporting student growth in the digital age as they navigate the online environment.

The rise of e-books in libraries, which were once filled only with print books, marks a significant change in the culture of reading within universities. This shift brings up important questions about how users find and engage with e-books compared to traditional print books. Are users leaning more toward print or digital formats, and what might be driving their choices? Do faculty and graduate students in different disciplines have varying preferences for book formats? To explore these questions, we surveyed science and engineering faculty and graduate students at the university. Print and electronic formats offer distinct benefits and drawbacks, particularly concerning journals. However, electronic journals generally provide more advantages for both users and institutions. The pros and cons associated with each format affect not just the users but also the institutions that support them.

The advantages of print periodicals over internet journals include: Being usable even in the absence of network access or energy. Easy to read. Advertisements, editorials, letters, and other comparable content may be missing from electronic journals. The main disadvantages of printed journals are the associated expenditures for institutions. In general, electronic journals are less expensive for a variety of reasons. Other concerns with print journals stem from the item's physical character. They can get lost, stolen, misplaced, damaged, or destroyed. They are also less searchable than electronic journals. Electronic journals typically offer all of the benefits of electronic media in general. Advantages of electronic journals include: Access by various persons, in multiple locations, at the same time, 24 hours a day; users do not need to visit the library. They are easier to search (including inside individual issues and articles, as well as across several titles and issues), store, and obtain exact quotes from Access to a broader range of journals Access to previously unavailable past issues. A decrease in the requirement for interlibrary borrowing. A number of studies have demonstrated that most users prefer electronic journals over print journals due to features inherent in the format, such as the ability to provide connections to other journals. They are easier to search (including inside individual issues and articles, as well as across numerous titles and issues), store, and gain accurate quotes from Access to a greater selection of journals Access to previously unavailable back issues. A reduction in the need for interlibrary borrowing. A number of studies have found that most users prefer electronic journals to print journals due to characteristics inherent in the format, such as the ability to provide links to other journals.

7.2 Statement of the Problem

There are aspects that influence user preference for information resources. Some of these include familiarity, skill, experience, knowledge, awareness, requirement, and satisfaction. Preliminary analysis of selected information resource users reveals the following reasons: lack of adequate electricity, stable internet services in time of network to access information resources, etc., some users prefer print material,

while others prefer digital resources because it's easier for them to access digital resources based on their experience with computers or awareness of the information age, other users opine the lack of computer skill, others preferred digital resources to some students because visiting physical libraries often causes them to be embraced by security; users understand that security lacks proper library ethics and enlightenment, so they prefer using digital sources rather than print resources because most libraries visited provide no satisfaction with what the library has at hand, as virtual reality speed and access to online resources provides for different ways students learn. Some users decided not to go to the library to access print resources and instead preferred digital materials because they had all of the information they need. Some users choose paper print because they have the abilities to effectively use their information resources, whilst many prefer ICT due to its simplicity of use and computer skills.

7.3 Objective of the Study

This study aims to examine the following objectives:

1. Identify the ideal information resources for clients at the University of Nigeria, Nsukka.
2. Identify characteristics influencing users' preferences for information resources at the University of Nigeria, Nsukka.

7. 4 Research Questions

The study was conducted in accordance with two research questions.

1. Which information resources are most popular among University of Nigeria Nsukka clients?
2. What variables influence users' access to information resources at University of Nigeria Nsukka?

7.5 Literature Review

The extensive range of print and non-print resources for general communication, information retrieval, and instructional delivery to support teaching and research activities in higher educational institutions is recognized globally. According to the literature, a number of relevant studies have been conducted on the usage of information resources by lecturers, research scholars, and students around the world. Studies have also been conducted on the use of information resources by users, with the conclusion that in an era of rapid technological development, the library must be refined in order to meet the needs and desires of the information age. For example, while discussing the 'plurality' of literacy, emphasis on the coinage, 'literacies', highlights that literacy is a dynamic notion that evolves throughout time and geography. And that we should also identify the flaws in the old definition of literacy and reframe it as "the ability to code and decode linguistic and other symbolic systems." Library users are rapidly switching to streaming services for music and movies, according to the study Media Consumption and Library Use Trends. This latest user report contains additional information about format preferences, including audio books and digital games, and also examines the most popular movie and music genres, information about how often user tend to place holds on different formats, and their habits when content is not immediately available. Digital resources contains;

E-journals	**Reference databases (biographies, dictionaries, directories, encyclopedias, etc.)**
E-books	E-Magazine, journal and newspaper
E-images	Galenet databases
E-audio/visual resources	Numeric and statistical databases
Full-text (aggregated) databases	E-Biographies
Indexing and abstracting databases	

Such as images, texts, users with coherent success to a very large, organized repository of information and knowledge." According to Berkeley Digital Library Project, University of California, the digital library will be a collection of distributed information sources. There are two different libraries with two different resources, i.e.

Traditional Libraries	Digital or Electronic Library
Print collection	All resources in digital form.
Stable, with slow evolution	Dynamic and ephemeral
Individual objects not directly linked with each other.	Multi-media and fractal objects
Flat structure with minimal contextual metadata	Scaffolding of data structures and richer contextual metadata.
Scholarly content with validation process	More than scholarly content with various validation processes
Limited access points and centralized management	Unlimited access points, distributed collections and access control
The physical and logical organization correlated.	The physical and logical organization may be virtually
One way interactions	Dynamic real time dialogue
Free and universal access.	Free as well as fee based.

Textbooks have been in use throughout history, yet they are still not commonly used. Despite significant advances in technology and the electronic world, acceptance of electronic textbooks differs by school level. Although students are becoming more technologically adept, demand for electronic textbooks remains modest (Jesdanun, 2016). Major barriers to electronic textbook adoption include digital rights management constraints (Regan, 2018), software and hardware diversity, limited collections, and electronic textbook design challenges. Most importantly, the usefulness of adopting electronic textbooks for students' remains uncertain, and the phrase "electronic book" is not commonly understood (Bennett and Landoni, 2015). This study focuses on students' experiences with electronic textbooks. First, it describes the definitions and differences types of electronic textbooks

The article then delves into recent research that demonstrate how electronic textbooks affect various levels of education. The study finishes with a commentary based on these studies. The purpose of this essay is to highlight users' experiences with electronic textbooks and make ideas for future development. How might electronic textbooks help students learn? What do pupils desire from technological devices? Another study. Ann (2018) investigated the preference for e-books versus printed resources and their impact on learning and discovered that students generally prefer printed materials, and there are no significant differences in learning between the two media. A third study (Woody, Daniel, & Baker, 2010), paralleling the findings of prior research, has likewise offered the conclusion that as course material, students prefer printed textbook rather than e-book. In another study, grades of university students from a course and perceived learning score were compared according to preference of electronic book or printed resource within the scope of a course. Although there is not a significant difference in the sense of grades as a result of study, perceived learning scores of students who prefer e-book was higher (Szapkiw, Courduff, Carter, & Bennett, 2013).

Slater (2019) did a study in Oakland University's university library that examined the circulation of e-books between printed materials and e-books from the online Library and Safari sources. One of the study's most striking findings was that, while users in the domains of science and technology preferred e-book formats, users in the fields of human.

7.6 Students mainly choose information resources

The introduction and growth of electronic resources and digital libraries has already influenced and altered how students and academics use print resources and traditional libraries. It has also spurred a new wave

of research into the perceptions and preferences for print and electronic materials. Undergraduates, graduate students, and professors have distinct perceptions and preferences for print and electronic resources. Previous research has examined undergraduate students' and faculty's perceptions and preferences for print and electronic materials. However, few research specifically target graduate students. Furthermore, very little is known about the variables that influence their choice of format of resources and the kind of libraries (i.e., traditional vs. digital) to meet and satisfy their information needs. This study attempts to investigate the extent to which graduate students in a metropolitan university setting use print and electronic resources. Another goal of this research is to look into the impact of topic discipline on reading preferences and the use of print and electronic resources. Studying these challenges might help us better comprehend the shifting patterns of information consumption in today's increasingly dense digital environment. Several studies have been conducted in recent years to investigate people's perceptions and preferences for print and electronic resources. The majority of these studies were done in the academic environment, with a special emphasis on surveying students and professors. Conduct an online survey of undergraduate library users at the University of Toronto. They discover that while undergraduate students often begin assignments and essays using electronic resources, traditional print resources (e.g., books and printed periodicals) remain critical components in their research because of their reliability and permanent accessibility. Strouse (2014) shows that users (especially younger users) have developed a clear preference for receiving information in electronic formats.

Numerous studies have examined people's preferences for print and electronic materials. The majority of these studies were conducted in academic settings, with a focus on polling students and professors. Dilevko and Gottlieb (2012) conduct an online survey of University of Toronto students. They discover that, while users typically begin assignments and essays with electronic resources, traditional print resources (e.g., books and printed journals) remain critical components in their research due to their dependability. Permanent users, particularly younger users, have developed a clear preference for receiving information in electronic formats and perceptions of electronic journals. They discover that a great majority of users (73%) prefer electronic journals over print journals, which contain linkages to capability, currency, availability, and convenience of access of printing, and ease of searching are among the most commonly cited reasons for preferring electronic journals, convenience, timeliness, and the ability to search text are the most important factors influencing faculty choice of electronic over print materials. On the other hand, the ability to browse, portability, physical comfort, and convenience are the most important characteristics leading them to choose print over electronic resources.

The library exits to satisfy its consumers. In this context, "user satisfaction" refers to how users evaluate library services. Indeed, it relates to whether library customers receive the information resources, facilities, and services they expect from the library. As a result, in recent years, assessing users' satisfaction with public library information resources, facilities, and services has become a major concern and an essential component of library and information science practice. This is because the ultimate goal of all libraries, as service-oriented organizations, is to meet the requirements of its patrons. Thus, users' satisfaction with the information resources, facilities, and services supplied by libraries, whether public or academic, has become the melting pot of modern librarianship and information.

While information resources, facilities, and services are significant components of library services, the degree to which they meet users' information preferences is inherently more important. This is because libraries' ultimate objective is to increase user pleasure. As a result, it is important to establish how satisfied users are with the library's information resources, facilities, and services. Libraries serve a diverse spectrum of users, including adult males and females, young adults, children, the visually impaired, and other groups in the communities where they are located. As a result, libraries play critical roles in grassroots information transmission in order to address the information needs of each of these communities. A variety of convergent trends, such as increased school enrollment at the basic, intermediate, and tertiary levels, highlight the importance of libraries in today's universities. Libraries must be proactive, energetic, and up to date on the newest innovations in information distribution in order to remain relevant and meet the diverse requirements and expectations of its users. As a result, the library must be able to supply the appropriate items to suit the information demands of its patrons.

In a recent study, Anunobi (2013) found that librarians have yet to have an impact on students. The study found that the presence of school librarians who teach students how to utilize libraries in universities had little influence, as seen by students' incapacity to use catalogues and indexes as library access points in their first year of university. Students argued that the nice demeanor of library personnel, as well as the library staff's willingness to assist users in obtaining essential items from within or through inter-library loan, will encourage users to use the library and, most importantly, boost users' happiness with library services. Researchers believe that the attitude of certain library staff is characterized by anger, rudeness, and a lackadaisical approach to requests or inquiries have often put off some potential library users in a survey of students utilization of academic libraries in Nigeria found that most often than not, some of the junior staff attitude towards users are discouraging in their services to the students. The negative attitude of certain librarians toward information technology in library operations is discouraging; students observed that the nature of library staff is a barrier to good library services. They also emphasized that the majority of the staff received traditional training, and that some of them simply refused to adjust to the new situation, preferring to maintain the status quo. They believe that friendliness and helpfulness of library staff is one of the sixth criteria they proposed for evaluating academic libraries.

Equally essential, libraries must respond to the critical question. The earlier part of this essay praised print publications and the objective value they provide to libraries and users, but the subjective value to a certain community may be judged on a different scale. Print, without a doubt, saves information for future generations; nevertheless, if libraries do not grasp and comprehend the media that their users prefer, the present generation may devalue the library to the point where it no longer exists to serve future users. Technology allows for rapid information updates, which is highly desired by academics, students, and practitioners seeking to assess the veracity of their arguments in light of new court decisions, legislation, and literature. Print publishing involves gathering, arranging, printing, and distribution, the latter two steps of which also require physical delivery to the subscribing institutions. Online databases remove delivery delays and allow information to be posted online as soon as it is created. They are resources that inform practitioners about current rulings or legislation that may have an impact on their case or statute. Databases remove delivery delays and allow information to be posted online as soon as it is created. Shepard and Key's examples demonstrate the beauty and appropriateness of such technological transmission. They are resources that inform practitioners about current rulings or legislation that may have an impact on their case or statute. Using the online version instead of the print volumes saves scholars both time and effort; the print version frequently needs checking three or more separate books or supplements and takes weeks, if not months. Some lawyers have even suggested that as professional standards evolve; use of an online citatory may become required.

Clipping and current awareness services can help researchers take advantage of the instant publication of material. Paper newsletters and newspapers serve the same role, but the digital media not only speeds up transfer but also allows for user customization. Individuals can receive information tailored to their present needs and interests. Print newsletters can focus on certain topics, but they lack the granular control that e-resources provide. Given the strength of electronic transmission, it is important to highlight that delays in online delivery are not commonplace.

7.7 Factors that Influence User Information Resources in Libraries

Information source selection in various information-seeking settings. The most commonly mentioned factors in the field of information science are accessibility, availability, convenience, and simplicity of use, all of which are directly related to search efficiency. Engineers evaluated the frequency with which decision makers used four different information sources, taking into account the effects of information quality and accessibility. When choosing information sources, decision makers prioritized accessibility above quality. In a proven research, the role of accessibility in the selection of information sources was evaluated in a distinct areas of accessibility for engineer information source selection, including familiarity, appropriate format, and different types of information, in particular, accessibility is the main concern for users in selecting information sources. In their study of user Web source consumption, they discovered that users rely on accessibility, ease of use, and availability when selecting resources. They also contended that ease of use, convenience, and accessibility were significant factors influencing internet use in libraries.

Users' information selection behavior revealed that the frequency with which they used information sources was connected to utility, availability, and simplicity of use. In contrast, the least frequently used information sources were perceived to be more expensive and have lower ease of use, availability, and utility of information, according to a survey of 230 science faculty and researchers at the University of Michigan to investigate the importance of six factors on their information resource preferences, including speed, convenience, familiarity, currency, authoritativeness, and reliable availability. They discovered that convenience was the most critical factor in choosing information sources. They recognized critical aspects impacting the selection of information resources in distant education, such as quick information retrieval, easy access, comprehensive electronic resources, convenience of use, and high system performance, especially concentrating comprehensive electronic resources, ease of use and high system performance, in particular focusing on journal usage, in different fields, for example, in their survey of medical faculty pediatricians emphasized the contribution of currency convenience, portability and reading patterns to the selection of journals

Furthermore, in their research on scientists and engineers, they identified multiple attributes and factors related to journal adoption, such as convenient access, availability, links to full-text, format, least effort, timeliness, and authority, and discovered that the task's time constraint was another decisive factor in determining the usefulness of an online resource. Their findings suggested that research scientists preferred information sources that were both easily accessible and comprehensive. They identified several factors associated with undergraduate information source selection, including accessibility, ease of use, comprehensiveness, and efficiency. Their research found that the most essential criteria for resource selection were accuracy and trustworthiness. Similarly, users considered trustworthiness to be one of the essential resource factors when deciding which sources to employ.

In addition, the format of the document is also a factor that influences the selection of information sources. Other studies have identified seventeen reasons for selecting information sources, including accessibility, comprehensiveness, interactivity, useful results, task type, familiarity with the source, among others.

7.8 Methodology

This research was conducted using the survey approach. This was because survey research established a strategy that investigates attitudes that are too vast to see directly and makes the study's sampling more realistic by allowing for the collection and analysis of data acquired from a specified library at the University of Nigeria, Nsukka. The population for this research work is undergraduate students at the University of Nigeria Nsukka, which operates 105 academic departments across fifteen (15) faculties, eighty-five (82) undergraduate programs, and two hundred eleven postgraduate programs, with a student population of thirty-six thousand (36,000), according to data from the MIS unit UNN 2015.

UNN selected 200 users from five faculties: medicine, pharmacy, law, education, and social sciences. This study used random sampling. This strategy gives every member of the population an equal chance of getting selected. The method demands that the population's exact size be known. Ferguson and Takame (2009) proposed a hat drawn approach for selecting the required sample size. The instrument used for data collection was a questionnaire, which allowed the researcher to collect the essential information from respondents. The researchers distribute the questionnaire to users of selected UNN libraries. The collected data was examined with frequency and simple percentages (statistics approach).The results are based on the raw scores and their equivalent.

7.9 Data Presentation, Analysis and Discussion

Data presentation, analysis and discussion present, analyze and discuss the data collected from the study. The data is presented in table, frequencies and percentages completed for each set of data. The analysis facilitated ease of interpretation and comprehension of the data. The analysis is also done with the findings arising from each category in the questionnaire and observation.

7.10 Response Rate

Two hundred and forty questionnaires were distributed to the users, two hundred (200) were duly completed and returned representing 83.33%.

Table 1: What are the information resources preferred by most clientele in University of Nigeria, Nsukka?

Information resource	No. Respondents	Percentage
Reference material	30	15%
Academic journal database	60	30%
Electronic resources	100	50%
Magazine/newspaper	10	5%
Blogs/forums	0	0%
Total	**200**	**100%**

Table one demonstrates that 100 respondents preferred electronic resources, 60 respondents selected academic journal databases, and 30 respondents preferred reference resources. Whereas 10 respondents (5% of 200 agreed) preferred magazines/newspapers, blogs/forums were not preferred. However, according to the data in the table above, electronic resources and the academic journal database are the most popular among clients at the university.

Table 1b: Types of Internet services mostly used by respondents

Services	No. Respondents	Percentage
World wide web (www)	65	32.5
E-mail	40	20
Google	55	27.5
User news	10	5
Telnet	0	0
File transfer protocol	5	2.5
News group	10	5
Mailing list	15	7.5
Total	**200**	**100%**

The above table reveals that 65 respondents represent 32.5% of the total respondents chose World Wide Web (www), 55 respondents represent 27.5% liked Google, 40 respondents represent 20% preferred E-mail, and 15 respondents represent 7.5% preferred. Mailing list, 10 respondents (5% each) selected News group and Users News, while 200 agreed that the internet (World Wide Web (www)) is used for their mailing list. However, the figures in the table above indicate that there is a high level of informational use for instructional activities at the university.

Table 2: What are the factors that account as challenges for the use of information resources in University of Nigeria, Nsukka?

Challenges	No. Respondents	Percentage
Online plagiarism	40	20
Poor browsing skills	80	40
Inadequate library resources	20	10
Power failure	35	17.5
Time	25	12.5
Total	**200**	**100%**

The above table shows that 40 respondents, or 20% of the total number of 200 respondents, account for online plagiarism as a challenge factor, 80 respondents, or 40%, account for poor browsing skills as a challenge factor, 20 respondents, or 10%, account for insufficient library resources, and 35 respondents, or 17.5%, account for power failure as a challenge factor. Whereas 25 respondents, or 12.5%, identify time as a challenge aspect. However, based on the statistics in the table above, respondents believe that inadequate browsing skills are the most significant obstacles that University users encounter.

Finding

A number of responses to the initial questions posed at the beginning of this research have revealed that many users prefer electronic resources over print resources. According to statistical table one, 100 respondents (50%) preferred electronic resources, while 60 respondents (30%) preferred academic journal databases. 65 respondents, or 32.5% of all respondents, selected World Wide Web (www) services, whereas 55 respondents, or 27.5%, preferred Google services. There are some issues that arise, such as ICT skills; 80 respondents, or 40% of the total number of 200 respondents, cite poor browsing skills as a barrier to quick retrieval of information resources, while 40 respondents, or 20% of the total number of 200 respondents, and cite online plagiarism. As outlined in this study, consumers' preferences for information resources in the University of Nigeria, Nsukka libraries are disturbing and cause for significant concern. The world is moving quickly in terms of technology, and libraries must either keep up or risk being left behind.

Conclusion

The role of users preferences in society as briefly mentioned in the research is a large subject to be consider, its ability and consistency in handling large volume of complex data, with high degree of precision at a phenomenal speed, and its applicability to virtually all areas of human endeavour are already established. When users' preferences for information resources are integrated into libraries, they usually influence users' preferences in their search habits for information resources within the libraries
.
Finally, this study raises numerous new topics that may be suitable for further research. Are researchers distinguishing between recreational and professional reading? (Future studies should account for this variable). How does the use of e-books compare to an individual researcher's use of print books? Is there a comparable decrease? Furthermore, a study that incorporates resource utilization by discipline and user preferences could be useful in determining if stated preferences match real library resources.

Way Forward

The findings presented above underlie three potential problems in using information resources itemize below:

1. There should be an orientation programme on the rate of user preference for electronic resources,
2. There should be an orientation programme on low access rates of traditional libraries, and a possible communication gap between library users and library administrators.

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CHAPTER EIGHT

USE OF ICT FACILITIES FOR EFFECTIVE MANAGEMENT OF SERIAL PUBLICATIONS AT THE KOGI STATE POLYTECHNIC LIBRARY, LOKOJA, KOGI STATE

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USE OF ICT FACILITIES FOR EFFECTIVE MANAGEMENT OF SERIAL PUBLICATIONS AT THE KOGI STATE POLYTECHNIC LIBRARY, LOKOJA, KOGI STATE

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Abstract

This study looks into how ICT facilities might be used to manage serial publications effectively at the Kogi State Polytechnic Library in Lokoja. The research was conducted by raising research questions, objectives of the study, literatures' were reviewed, the problems and challenges in using ICT facilities were identified, research method was adopted for the study, instrument for data collection were designed, procedure for data collection were reached, procedure for data analysis and discussion were followed, questionnaire were used for the study, data were presented, analyzed, and discussed, the research also presented the study's findings, conclusions, and recommendations were presented.

Keywords: Information and communication technology (ICT), digital information, Management, Serial publications.

8.1 Introduction

The integration of Information and Communication Technology (ICT) in academic libraries accounding to Aliyu & Mohammed, (2023 has become a crucial aspect of modern library management, particularly in managing serial publications. Serial publications such as journals, magazines, periodicals, and newspapers require effective management due to their frequent updates and varying formats. Academic libraries, like the Kogi State Polytechnic Library in Lokoja, Kogi State, face unique challenges in handling these resources, which require constant updates, cataloging, indexing, and storage. To overcome these challenges and provide enhanced access to users, the adoption of ICT facilities has become essential.

The Kogi State Polytechnic Library, like many academic institutions in Nigeria, has recognized the importance of ICT in improving the management and accessibility of serial publications. The library's efforts to incorporate ICT tools into its operations aim to streamline processes, increase efficiency, and improve user satisfaction. This approach helps ensure that students, researchers, and faculty members have quick and easy access to the latest editions of academic journals, magazines, and other serial publications.

This study explores the use of ICT facilities for the effective management of serial publications at the Kogi State Polytechnic Library. It evaluates how various ICT tools and systems are being utilized to streamline the acquisition, cataloging, circulation, and storage of serial publications. The study also seeks to identify the challenges associated with the use of ICT in managing serials and offers recommendations for improving these processes.

8.2 Information and communication technology (ICT)

According to Bamidele (2016), ICT is a revolution that involves the use of computers, internet and other telecommunication technology in every aspect of human endeavour. Ozoji in Jimoh (2017) defined ICT as the handling and processing of information (text, images, graphs, instruction, etc.) for use, by means of electronic and communication devices such as computers, cameras, telephone. Similarly, Ofodu (2017) also define ICT as electronic or computerized devices, assisted by human and interactive materials that can be used for a wide range of teaching and learning as well as for personal use. From these definitions, ICT could be defined as processing and sharing of information using all kinds of technologies for the manipulation and communication of information.

However here are some ICT facilities being utilize for effective management of serials publications, according to Babajide and Bolaji (2013), Ofodu (2017) include; radio, television, computers, overhead projectors, optical fibers, fax machines, CD-ROM, internet, electronic notice board, slides, digital multimedia, video/VCD machine and so on.

8.3 Services performed with ICT facilities

According to Aliyu & Mohammed, (2023) ICT facilities offer several services that are crucial for the effective management of serial publications. These services include:

1. **Cataloging and Classification:** ICT tools automate the cataloging and classification of serial publications, making it easier to organize and access materials. Library management software systems can categorize serial publications by subject, title, volume, and other relevant metadata, making retrieval more efficient.
2. **Acquisition and Subscription Management:** ICT systems help in the management of subscriptions to various serial publications. Library staff can track renewals, monitor budgets, and

record subscriptions to various journals and magazines, ensuring the availability of up-to-date materials for library users.

3. **Access and Retrieval:** ICT enables the creation of online catalogs and digital libraries that provide users with quick and easy access to serial publications. Electronic databases, e-journals, and other digital resources can be accessed remotely, which is particularly important in an era where digital content has become dominant.
4. **Digitization of Print Materials:** Libraries use ICT to digitize physical serial publications, preserving them for future generations while making them accessible to a broader audience. This also helps libraries manage the growing volume of print materials more effectively by reducing physical storage space requirements.

User Support Services: ICT facilitates communication with library users, allowing librarians to provide timely support for accessing serial publications. Online reference services, email communication, and virtual assistance can all be managed through ICT platforms, offering users more responsive and personalized support

8.4 Statement of the Problem

Despite the significant potential of ICT to improve library services, many academic libraries, including the Kogi State Polytechnic Library, face challenges in the effective utilization of ICT for managing serial publications. The problems are multifaceted and include inadequate infrastructure, insufficient training for library staff, and financial constraints that limit the acquisition of necessary ICT tools and systems. Additionally, many libraries still rely on traditional methods of cataloging and managing serial publications, which are time-consuming and prone to errors.

Moreover, the rapid pace of technological advancement poses a challenge for libraries in keeping up with new software solutions and ensuring that their existing systems remain relevant and efficient. There is also the issue of limited access to electronic serials due to subscription costs and the digital divide that prevents some students and staff from benefiting fully from online resources.

This study seeks to address these issues by exploring how ICT facilities are currently being utilized in the Kogi State Polytechnic Library to manage serial publications and identifying areas where improvements can be made. By understanding the challenges and opportunities associated with ICT usage in serials management, the study aims to provide recommendations for enhancing ICT infrastructure and services, thus improving the overall management of serial publications in the library.

8.5 Research Questions

1. What are the ICT facilities available in the serial unit of Kogi state polytechnic library?
2. What serials operations are performed with ICT facilities in Kogi state polytechnic library?
3. What types of ICT facilities are used for these serials operations?
4. What are the challenges faced in using ICT facilities in serials unit of the library?

8.6 Objectives of the Study

Based on the research questions raised, the following objectives were identified:

1. To determine the activities carried out in the serial unit of Kogi state polytechnic library.
2. To find out which serials operations are performed with ICT facilities in Kogi state polytechnic library.
3. To identify the ICT facilities that are used for these serials operations.
4. To find out the impact of ICT facilities in serials operations of the library.

8.7 Information and communication technology facilities available in the library

In modern academic libraries, Adeoye, & Salisu, (2023) posit that Information and Communication Technology (ICT) facilities play a vital role in supporting efficient library services, enhancing information access, and improving user experience. The integration of ICT into library operations has transformed traditional library management systems, allowing libraries to better handle various tasks such as cataloging, resource management, information retrieval, and communication with users. At the Kogi State Polytechnic Library, Lokoja, a range of ICT facilities are available to ensure effective management of resources, including serial publications.

1. Computer Systems and Workstations

One of the most basic but essential ICT facilities in a modern library is the availability of computer systems and workstations. These systems are used by both library staff and users to access library catalogs, digital resources, and databases.

- **Staff Workstations:** Library staff use computers for administrative tasks such as cataloging, circulation management, and maintaining databases of serial publications.
- **Public Access Computers:** These computers are available to library users for browsing the internet, accessing digital resources, and using online catalogs to search for serial publications and other library materials.

2. Library Management Software

Library Management Software (LMS) is central to managing and automating various library functions, including the cataloging, circulation, and retrieval of serial publications. LMS systems help streamline library operations, making it easier to manage serials, track user activities, and update inventories. Popular examples of library management software used in academic libraries include **KOHA**, **Libsys**, and **Alma**.

- **Cataloging and Classification:** LMS helps in automating the classification and cataloging of serial publications, ensuring that materials are systematically organized and easily accessible.
- **Circulation and Loan Management:** The software is used to track the borrowing and return of serial publications, ensuring that there are no issues with overdue items.

3. Internet Access and Wi-Fi Connectivity

Access to the internet is critical in the modern library environment, especially for enabling remote access to electronic serials, online journals, e-books, and other digital resources. The Kogi State Polytechnic Library is equipped with **Wi-Fi connectivity** throughout the library, allowing both staff and students to access a wealth of online academic content.

- **Online Journals and E-Resources:** Internet access supports the use of databases such as JSTOR, Elsevier, and other academic repositories, which offer full-text access to a wide range of serial publications.
- **Remote Access for Users:** Students and faculty can access digital versions of serial publications from anywhere within the campus via the library's wireless network.

4. Digital Catalog (OPAC)

The **Online Public Access Catalog (OPAC)** is an integral ICT facility used by libraries to enable users to search for, view, and retrieve bibliographic information about books, journals, and serials. The OPAC is accessible from any internet-connected computer or mobile device, allowing users to check the availability

of serial publications in the library's collection and perform advanced searches based on various parameters (e.g., title, author, year of publication).

- **Search Functionality:** OPAC allows users to search for specific serial publications, helping them find the materials they need quickly and efficiently.
- **User Interaction:** Users can view real-time availability of serials and check their borrowing history and due dates.

5. Digital Repositories and E-Resources

Digital repositories, such as institutional repositories or online databases, house electronic copies of journals, serial publications, and other scholarly resources. These repositories help libraries manage and provide access to a large volume of academic materials in electronic format.

- **Electronic Serial Publications:** Many serials are now digitized and made available via the library's digital repository, allowing users to access past and current issues of academic journals and periodicals.
- **E-Journals and Databases:** Access to subscription-based databases like **Science Direct**, **Springer Link**, and **EBSCOhost** allows students and researchers to explore a wide range of journals and serial publications.

6. Multimedia Equipment

ICT facilities also include multimedia equipment that supports the teaching and learning process in the library. For instance:

- **Projectors and Screens:** These are used for training sessions, seminars, and workshops on how to effectively use library resources, including serial publications.
- **Audio-Visual Equipment:** This includes tools like microphones, speakers, and video conferencing tools, which are especially useful for remote learning and research collaboration.
- **Printers and Scanners:** Users can print and scan articles from serial publications, providing greater access to physical copies of digitized content.

7. Electronic Information Kiosks

These are self-service stations that provide users with information about the library's holdings, including serial publications. They offer easy access to the catalog, and in some cases, users can directly check out materials without the need for staff intervention.

- **Self-Check Systems:** These systems enable users to borrow and return serial publications without direct interaction with a librarian, enhancing service efficiency and reducing queues.

8. Digital Archives and Storage Systems

To preserve and store serial publications efficiently, libraries rely on **digital archives** and **storage systems**. These systems are used to store digitized versions of print publications, ensuring long-term access and preservation.

- **Cloud Storage:** Cloud-based storage systems allow for the secure storage of digital versions of serials, ensuring that they are available for access at all times, even in the case of hardware failure or other technical issues.

9. ICT Training and Helpdesk

For effective utilization of ICT facilities, library staff and users need to be properly trained. The library offers ICT training sessions for students, faculty, and staff, ensuring they are familiar with the tools and systems used in managing serial publications. Additionally, the library provides a **helpdesk service**, where users can seek assistance in using ICT facilities for research, accessing serial publications, and troubleshooting issues related to library systems.

10. Digital Learning Platforms

Some libraries integrate digital learning platforms that provide access to online courses and educational resources. These platforms are especially beneficial for faculty and students who require access to academic journals and serials for research and learning purposes.

The ICT facilities available at the Kogi State Polytechnic Library are essential for the effective management of serial publications. They streamline library operations, facilitate easy access to resources, and enhance the overall user experience. By integrating various ICT tools, the library not only improves its operational efficiency but also meets the growing demand for digital and remote access to academic information. However, the full potential of these ICT facilities can be realized only when there is continued investment in infrastructure, staff training, and user awareness programs.

8.8 Information and communication technology

According to Bamidele (2016), ICT is a revolution that involves the use of computers, internet and other telecommunication technology in every aspect of human endeavour. Ozoji in Jimoh (2017) defined ICT as the handling and processing of information (text, images, graphs, instruction, etc.) for use, by means of electronic and communication devices such as computers, cameras, telephone. Similarly, Ofodu (2017) also define ICT as electronic or computerized devices, assisted by human and interactive materials that can be used for a wide range of teaching and learning as well as for personal use. From these definitions, ICT could be defined as processing and sharing of information using all kinds of technologies for the manipulation and communication of information.

8.9 Serials operation performed with ICT facilities

Accordinging to Oketunji (2011), and Agbaje (2012) noted that using various approaches, ICT facilities in serials unit can be for the following functions and activities: subscription control, procurement process, order preparation, fund analysis and accounting. They can also be used for bibliographic file control, cataloguing of new serials, preparation of serials record entries and transaction control. Effecting serials additions, changes and deletions or collection control can be performed with ICT facilities. Services and preservation functions such as servicing request for serials publication, binding control file, missing issues, holdings accession of want list as well as union lists are amenable to ICT facilities use. In their findings on the use of computer for library services in Bangladesh.

Information and communication facilities used for serials operations are:

(1) CD Drive/CD ROM

The library has CD-Drives for accessing the CD –ROMs they subscribe to. This development is interesting, as it will facilitate information /document delivery and transfer. To some extent it may lead to reduction of over borrowing, theft etc.

(2) Computer printer

The printer is used for printing out papers from the computer.

(3) Scanner

Is used in converting hard copy to soft copy

(4) Computer

A computer is an electronic machine that is programmed and is capable of accepting and outputting data (information) i.e. store, retrieve and send information.

(5) Internet

Is a global network of computers communicating under one set of guidelines, formally called the transmission control protocol (TCP/IP). Internet is a global collection of many types of computer and computer networks that are linked together.

(6) Network

A network is collection of computers, communication hardware and software together to allow the sharing of resources and to provide a facility for communication.

(7) Email

Electronic mail allows the exchange of text messages and computer files transmitted via communications networks such as internet. Islam and Islam (2017) discovered that all the libraries surveyed used ICT for serials control as well as other activities. The services provided according to them include CD-ROM searching, online searching, online networking, photocopying, online information services and database searching services. In Nigeria according to Ikem and Ajala (2010), preliminary use of ICT in the library started with its use to produce Union list of Serials sponsored by Committee of University Librarians of Nigeria. Nwalo (2013) describe serials as publications issued in successive parts, at regular intervals and intended to be continued indefinitely. There are many kinds of serials, this include: newsletters, accessions, newspapers, magazines, journals, indexes, abstract etc. According to Ogunrombi (2017) serial publication form the backbone of any academic library because of their nature of informational value.

8.10 Challenges to the use of ICT facilities in serial unit of the library

The integration of Information and Communication Technology (ICT) in library management, especially in the serials unit, according to Adamu, & Nwogu (2023) has significantly enhanced operational efficiency and service delivery. However, despite the many advantages, the use of ICT facilities in managing serial publications still faces several challenges. These challenges hinder the full utilization of ICT tools in libraries such as the Kogi State Polytechnic Library and other academic institutions. Below are some of the key challenges to the effective use of ICT facilities in the serial unit of the library:

1. Inadequate Infrastructure

One of the most significant challenges to the effective use of ICT in library serials management is the lack of adequate infrastructure. Libraries, especially in developing regions, may not have sufficient hardware (computers, servers, workstations) or network infrastructure to support ICT-based library systems effectively.

- **Power Supply Issues:** Frequent power outages or unreliable electricity sources can disrupt the use of ICT facilities in libraries. The inconsistency of power supply impacts the smooth functioning of digital catalogs, databases, and other ICT tools.
- **Hardware Limitations:** Outdated or insufficient computers, printers, and scanners may slow down the processes of managing serials. Poor-quality hardware can lead to delays and technical malfunctions, reducing the effectiveness of ICT-based systems.

2. Limited Internet Access and Bandwidth

While the use of the internet is essential for accessing digital serials, electronic journals, and online databases, many libraries, especially in less urbanized areas, face limited internet connectivity and bandwidth issues.

- **Slow Internet Speeds:** Inadequate internet speed can cause delays in downloading large files, accessing online journals, and performing other resource-intensive tasks such as database searches.
- **Limited Access to Online Resources:** High costs for accessing subscription-based online databases or e-journals may limit the range of serial publications available for library users. In many cases, only limited resources are accessible, which restricts the library's ability to offer a comprehensive range of serial publications.

3. Insufficient Staff Training and Capacity Building

Many libraries face challenges related to the level of ICT knowledge among staff members. While ICT facilities might be available, without proper training, library personnel may not be able to use these tools efficiently, especially in specialized areas such as managing serial publications.

- **Lack of Technical Expertise:** Library staff may lack the technical skills required to maintain and troubleshoot ICT systems, leading to operational delays or even system breakdowns. In some cases, libraries may not have an IT support team capable of handling system updates, software maintenance, or the installation of necessary tools.
- **Inadequate Training for Staff:** Even when staff members are trained, the rapid pace of technological change means that continuous professional development is necessary. Without updated training programs, library staff may fall behind on the latest tools and practices for serials management.

4. Data Management and Digitization Challenges

The digitization of serial publications and their efficient management in digital formats pose significant challenges to many libraries. Serial publications, in particular, are difficult to manage due to their continuous nature (i.e., new editions are published regularly), and ensuring their digital preservation can be problematic.

- **Inconsistent Metadata Standards:** Cataloging and indexing serial publications in digital formats require consistency in metadata standards. Without standardized practices for metadata creation, it becomes difficult to organize, retrieve, and manage serial publications effectively.
- **Digital Preservation Issues:** Serial publications are typically published frequently, and maintaining their digital archives can become a complex and resource-intensive task. Ensuring the long-term preservation of digital files, especially for older or rare serials, can be a challenge due to technological obsolescence or inadequate storage infrastructure.

5. Cost Constraints

The implementation and maintenance of ICT facilities in library serials units can be costly. Budget constraints often limit libraries' ability to invest in the latest technology, software, and systems needed for efficient serials management.

- **High Cost of Software and Subscription Services:** The purchase of library management software, databases, and electronic serial subscriptions often requires significant financial outlay.

Many libraries in developing countries face difficulties in securing funding for these purposes, leading to reliance on outdated or inadequate systems.

- **Ongoing Maintenance Costs:** Regular maintenance, including hardware repairs, software updates, and system backups, requires additional funding. These ongoing costs can strain the budgets of libraries, which may already be stretched thin due to other financial priorities.

6. User Resistance and Lack of Awareness

While ICT facilities offer many advantages, there may be resistance to adopting new technologies from both library users and staff. This resistance often stems from a lack of familiarity or understanding of how ICT tools can improve library services.

- **Resistance to Change:** Library users, especially those who are accustomed to traditional methods (e.g., browsing physical catalogs or manually checking out publications), may be reluctant to transition to digital systems. Similarly, staff members might resist using new software or learning new workflows, slowing down the integration of ICT in library operations.
- **Lack of Awareness among Users:** Many library users may not fully understand how to use ICT resources effectively, especially if there is a lack of user training or orientation programs. This can result in underutilization of available ICT facilities, such as online catalogs, digital journals, and e-resources.

7. Security and Data Privacy Issues

The use of ICT facilities in libraries raises concerns about the security and privacy of sensitive data, particularly when managing personal user information and digital records of serial publications.

- **Cybersecurity Risks:** Libraries that use digital systems for managing serial publications may face risks of data breaches, hacking, or unauthorized access to confidential information. These security threats can compromise the integrity of library systems, causing disruptions and potential loss of data.
- **Privacy Concerns:** Library systems that collect and store user information (such as borrowing history or personal details) need to ensure that they comply with data privacy laws and regulations. Poor data management practices can lead to violations of user privacy and legal consequences.

8. Technical Support and Maintenance

Ongoing technical support is crucial to ensure that ICT systems remain operational and up-to-date. In many libraries, the lack of dedicated IT personnel or external technical support can hinder the effective use of ICT facilities.

- **Lack of Dedicated IT Staff:** Smaller libraries, or those with limited budgets, may not have dedicated IT staff, resulting in slower responses to technical issues. The absence of specialized support means that even minor technical problems with library software or hardware can cause significant disruptions.
- **Software Maintenance and Updates:** Keeping library software, database management systems, and digital archives up to date requires regular maintenance and updates. The failure to update systems or address bugs can lead to system failures, inefficiencies, and security vulnerabilities.

While ICT facilities have the potential to greatly improve the management of serial publications in academic libraries, various challenges hinder their effective utilization. These include infrastructure limitations, insufficient staff training, budget constraints, digital preservation difficulties, resistance to change, and security concerns. To overcome these barriers, libraries need to invest in improving infrastructure, providing continuous training for staff, ensuring access to reliable internet services, and securing adequate funding

for ICT tools and software. By addressing these challenges, libraries can enhance their capacity to manage serial publications more effectively, ultimately improving access to information and supporting academic research.

8.11 Methodology

The survey research method was adopted for the study. According to Walomick (2015) a survey is a method of research use to collect participants' responses on facts, opinions and attitude. While Aina and Ajirferuke (2012), argued that, survey design could be conveniently used in large and small population without sacrificing efficiency in addition to time and money saving currency. This method is considered appropriate because it allow extensive gathering of information for its easier, convenient and flexible. The target population for this study comprises the entire library staff of Kogi State polytechnic with a total population of fourty five, since the population is not large and it is manageable, the researchers used the whole population for the study. Bernard (2012) also supported this by asserting that if population of a study is less than two hundred (200) the entire population should be used for the study. The instrument used for collecting data in this study is questionnaire. The copies of the questionnaire were administered to the respondents by the researchers and retrieved after completion. The data collected for this research was presented and analyzed using frequency counts, tables, and percentages.

8.12 Response rate

A total of fourty five (45) questionnaire were distributed to the library staff. 42 (93.3%) were duly completed and returned' while 3(6.7%) are missing. This high response rate could be attributed to the co-operation and assistance received from the respondents.

Table I: ICT Facilities Available in Kogi State Polytechnic library

ICT facilities	Frequency	Percentage (%)
Computer	25	59.5
Scanner	2	4.7
Internet	10	23.8
Network	5	11.9
Total	**42**	**100**

Table 1 above reveals that, about 25(59.5%) of the respondents are of the view that computer is among the ICT facilities available for serial operations, where 2(4.7%) of the respondents are of scanner, where 10(23.8%) express internet, while network takes the remaining 5(11.9%) of the respondents. The above findings clearly indicate that majority of the respondents are of the view that computer is the only ICT facility mostly available for serial operations in Kogi State Polytechnic Library serial unit.

Table 2 Operations performed with ICT facilities in Kogi State Polytechnic library

Operations performed	Frequency	Percentage (%)
CD-Rom searching	0	0
Online Searching	8	19.0
Photocopying	28	66.6
Online Networking	6	14.2
Total	**42**	1**00**

Table 2 above reveals that, there was no CD-ROM searching. Where 8(19.0%) of the respondents are of the view of online searching, where 28(66.6%) are of the view of photocopying, while online networking takes the remaining 6(14.2%) of the respondents. The above findings indicate that photocopying takes the majority of serial operations performed with ICT facilities.

Table 3 ICT Facilities used in Kogi State Polytechnic library

ICT facilities	Frequency	Percentage (%)
Internet	10	23.8
Network	5	11.9
Scanner	2	4.7
Computer	25	59.5
Total	**42**	**100**

Table 3 above reveal that about 25(59.5%) of the respondents are of the view that computer is among the ICT facilities used for serial operations, where 2(4.7%) said scanner, 10(23.8%) posit internet, and network contains the 5(11.9%) of the respondents. The above findings clearly indicate that computer is the ICT facility mostly used for the serial operations in Kogi State Polytechnic Library serial unit.

Table 4 Challenges faced in using ICT facilities in Kogi State Polytechnic library

Challenges faced in using ICT facilities	Frequency	Percentage (%)
Lack of technical support	6	14.2
Lack of basic knowledge	26	61.9
Difficulty in locating the needed facilities	0	0
Others (specify)	10	23.8
Total	**42**	**100**

Table 4 above reveals that, about 26(61.9%) of the respondents are of the view that lack of the basic knowledge is the major challenges of using ICT facilities for effective management of serial publications. Where 10(23.8%) are of the view of others, 6(14.2%) are of the view of lack of technical support, and no responses for difficulty in locating the needed facilities. From the findings we can see clearly the various challenges faced in using ICT facilities for effective management of serial publications in Kogi State Polytechnic Library. Whereas lack of basic knowledge become the major challenges

Findings

The summary of the findings are as follows;

1. The findings shows the ICT facilities are available for effective management of serial publications in Kogi State Polytechnic Library
2. The findings also show that, there are challenges encountered in using the ICT facilities for serials publications.
3. The findings shows the serials operations are performed with ICT facilities in Kogi State Polytechnic Library.
4. The study further revealed that, inadequate trained personnel and lack of proper uses of the ICT facilities are the major problems that affect the utilization of serial publications in Kogi State Polytechnic Library.
5. Based on the findings, it was observed that through organizing workshops, seminars, conferences and recruitment of well trained staff, the major ways to enhance the utilization of ICT facilities for effective management of serial publications will be enhanced.

Conclusion

Conclusively, it can be revealed that this study shows how ICT facilities can be utilize in providing effective management of serial publications. However, for the library to sustain and improve on this there is need to organized workshops, seminars, and conferences for the library staff regularly at all levels. Moreover there is a need to provide proper channels of communication between the library staff and the library users.

Recommendations

The following recommendations were made base on the findings;

1. Kogi State Polytechnic Library management should provide strategies and policies that will enable utilization of ICT facilities for effective management to be more relevance to library services.
2. Kogi State Polytechnic Library management should give proper support to the provision of more computers and other aided facilities to the library, to enable the library to rendered effective management of serial publications.
3. The library management should rebuild the library serial unit with adequate and updated ICT facilities for effective management of serial publications.
4. Finally, the researchers recommend that Kogi State Polytechnic Library should organized seminars, workshops, conferences, offering promotion and in - service training in order to motivate the library staffs to performing their duties effectively as desire.

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CHAPTER NINE

RELEVANCE OF INFORMATION RESOURCES AND SERVICES IN DIVISIONAL COLLEGE OF AGRICULTURE LIBRARY, AHMADU BELLO UNIVERSITY, ZARIA

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Abstract

This research examines the information resources and services provided by the Division of the College of Agriculture in Zaria. The objective of the study was to assess the relevance of the existing information resources and the types of services offered to library users. Four research questions were formulated to guide the investigation. A survey method was employed for data collection to meet the study's objectives. The study's population consisted of 200 individuals, all of whom were included in the sample. The data collection instruments utilized included questionnaires, interviews, and documentary analysis. Data

analysis was conducted using frequency distributions, tables, and percentage scores. The findings indicated that the information resources available in the DAC library were pertinent to the institute's programs. Additionally, the study found that the DAC library provides various services to its users. It was also noted that the library is primarily utilized for research, reading, and completing assignments. The study concluded with recommendations for acquiring more current and relevant information resources, as well as suggestions for the removal of outdated materials and the installation of additional photocopy machines.
Keywords: Photocopy Machines, Information Resources. Relevance Information, Dictionary, Bibliography

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9.1 Introduction

A library is defined as an organized collection of books, journals, educational materials, and historical documents, which also encompasses electronic advancements such as computers, the internet, and various audiovisual resources, all systematically arranged for efficient access. According to Harrod (2017), a special library is created and sustained by an organization to collect, organize, and distribute information, focusing on a specific subject area and providing tailored services to a distinct audience. A diverse array of reading and informational resources is available across various subject domains, aligned with the institution's foundational objectives.

Information resources encompass a variety of books and non-book materials available in the library for user access, including items such as microphones, tapes, computers, diaries, and internet access. Ai'yedogbon (2011) characterized library resources as the collection of materials ranging from books to non-book items that are accessible to users. It is essential that these information resources are sufficient, up-to-date, and systematically organized. Supporting this view, Izang (2010) noted that it is insufficient for a library merely to select, acquire, preserve, and organize its media collection; it must also ensure that these materials adequately address the diverse information needs of its users.

Furthermore, libraries offer information services tailored to their clientele, which are often shaped by the specific organization they serve and its objectives. Library services can be categorized into various types based primarily on functional similarities, including national, academic, public, school, special, and private libraries. Information services provided may include user orientation, referrals, photocopying, abstracts, indexes, bibliographies, loan services, and technical services, among others. Ashon (2019) emphasized that libraries deliver services that facilitate the dissemination of information, particularly in areas such as current awareness services, abstraction, and indexing services, which are beneficial to users. Organization of information resources refers to, collection of the library organized according to the library congress classification scheme. This is done in subject order. Organization of library in this order enables the readers to browse through the books which are related by subject to those on the neighboring shelves. For users to identify what the library has in stock, a classified catalogue is provided which has author/titles classified and subject index entries.

9.2 Statement of the Problem

The resources and services provided by a library must be pertinent and effective in order to meet the needs of its users. If the library's resources, including books, microforms, tapes, diaries, and computers, are neither relevant nor adequate, the library's purpose is compromised. Similarly, if the services offered, such as loan transactions, reading facilities, binding, and photocopying, lack relevance and sufficiency, the library's objectives are also undermined. The overall effectiveness of a library is contingent upon the quality of its resources, while the efficacy of its services is reliant on the materials available. Silva and Turnoff (2010) noted that the fundamental role of a library is to provide books and information. Therefore, it is essential for library resources to be both relevant and efficient to fulfill the needs and aspirations of users; otherwise, the library's objectives are jeopardized. Library services encompass the procedures employed by librarians to effectively disseminate information resources within the library.

The DAC library, being a specialized institution, necessitates unique information resources and materials pertinent to its specific areas of expertise and operations, distinguishing it from traditional libraries. The information resources and services provided by the DAC library may or may not adequately fulfill the requirements of its users. This situation prompted the researcher to undertake this study. Consequently, this research aims to assess and document the current status of the DAC library concerning its resources and services, with the objective of evaluating its effectiveness for users.

9.3 Objectives of the Study

The aims of the study are as follows:

1. To assess the information resources accessible within the DAC library.
2. To ascertain the relevance of the information materials available in the DAC library in relation to the program and its users.
3. To evaluate the various services offered by the DAC library to its users.
4. To investigate the purposes for which users utilize the information resources.

9.4 Research Questions

1. What categories of information resources are accessible to users in the DAC library?
2. What relevant information materials does the DAC library offer in connection with the program?
3. What types of services are extended to the users of the DAC library?
4. For what purposes do users engage with the information resources in the DAC library?

9.5 Information Resources

Information resources, as indicated by the term itself, encompass a variety of materials available in libraries for the use of patrons, including books, non-book items, printed documents, graphic materials, microforms, tapes, computers, and diaries. Elaturoti (2017) defines the term "information resources" within the library context as any entity that can provide intellectual engagement for readers or learners. This broad category includes books, periodicals, newspapers, pamphlets, ephemeral materials, audio recordings, films, graphics, computers, and even individuals and objects within the community.

Library information resources are essential materials that enable libraries to perform their functions effectively, as noted by Fayose (2010). These resources consist of books and various media that convey information, categorized based on their purpose and academic level. They include both study/teaching materials and research materials. According to Fayose (2015), study/teaching materials are those resources necessary for students' academic pursuits, comprising recommended textbooks, journals, past examination papers, reference books, and monographs. Conversely, research materials are utilized by postgraduate students and faculty, including periodicals, documents, treaties, manuscripts, pamphlets, government publications, and conference proceedings.

Aina (2014) noted that information resources encompass a variety of materials, including "books, serial manuscripts, cartographic materials, sound recordings, motion pictures and video recordings, microform, and digital materials." Osborn (2012) expressed that information resources consist of items such as books, periodicals, and audiovisual materials that are made available for public use. These resources are typically housed within a facility and organized systematically to facilitate easy access. Conversely, Bida (2011) emphasized that information resources can be classified into two categories: print and non-print materials.

9.6 Types of Information Resources

The Federal Ministry of Education (1999) handbook outlined the minimum standards for school libraries, which include a range of information resources and materials to be acquired, such as "reference books, non-fiction, textbooks, supplementary orders, and fiction (storybooks, novels, cartoons)." Libraries, regardless of their specific type, are considered repositories of both published and unpublished information resources.

Popoola and Haliso (2017) indicated that information resources encompass materials that convey information. These resources exist in both printed and electronic formats, including textbooks, journals, indexes, abstracts, newspapers, magazines, reports, compact discs, databases, internet videos, tapes or cassettes, diskettes, magnetic disks, computers, microphones, and more. Such materials represent raw information that libraries acquire, catalog, and maintain for the benefit of users. Libraries consist of physical structures and the information resources they contain. The information resources available within a library are categorized into two primary types: print and non-print resources.

9.7 Print Information Resources

According to Abdulsalami and Abdulsalami (2016), print information resources in the library refer to items that are produced on paper and are available in book format. Users of these materials must possess reading skills, as this is the sole method for engaging with print resources. Print materials can be found in various forms.

a. A book is a printed work that is typically bound in one or more volumes. It can be authored by individuals or organizations. Silva and Turnoff (2013) emphasized that the essence of a library lies in its provision of books and information.

b. A book refers to a printed medium that is commonly bound in one or more volumes. It may be authored by one or multiple individuals or organizations. Silva and Turnoff (2013) highlighted that the fundamental purpose of a library is to provide access to books and information.

c. A book is defined as a printed document that is frequently bound in one or more volumes. It can be created by one or several authors, whether individuals or corporate entities. Silva and Turnoff (2013) pointed out that the primary function of a library is to supply books and information.

d. A book is characterized as a printed item that is often bound in one or more volumes. It may be the work of one or more authors, whether individuals or corporate bodies. Silva and Turnoff (2013) noted that the core concept of a library revolves around the provision of books and information.

e. A dictionary serves as a reference work that compiles words or terms related to general or specific subjects and professions, typically offering essential information about them. Dictionaries are organized in alphabetical order. The fundamental information provided by a dictionary includes meanings, spellings, origins, pronunciations, usages, and abbreviations, among other details. There are both general and specialized dictionaries, such as the Advanced Learners Dictionary and the Longman Contemporary English Language Dictionary. Adedigba (2012) indicated that the reference section of libraries contains materials such as dictionaries, encyclopedias, biographical sources, maps, atlases, gazettes, directories, handbooks, guides, almanacs, yearbooks, indexes, abstracts, and bibliographies, which are utilized by many users rather than being read from cover to cover.

f. A dictionary is a type of reference material that enumerates words or terms pertaining to general or specific subjects and professions, usually providing fundamental information about each entry. These dictionaries are systematically arranged in alphabetical order. The basic information typically included in a dictionary encompasses meanings, spellings, origins, pronunciations, usages, and abbreviations, among other aspects. Dictionaries can be categorized into general and specialized types, such as the Advanced Learners Dictionary and the Longman Contemporary English Language Dictionary. According to Adedigba (2012), the reference section of libraries includes dictionaries,

g. A directory serves as a reference tool that compiles information about individuals, businesses, institutions, and organizations, providing their names and addresses. Examples of directories encompass telephone directories, school directories, hospital directories, and directories of government entities, among others. Almanacs and yearbooks represent another category of

reference materials. These resources document annual activities and events at various levels, including national, continental, regional, and global scales, and are presented in either descriptive or statistical formats. They cover a wide range of topics, including politics, economics, business, culture, education, music, science, and sports. Notable examples include Whitaker's Almanac and the Nigerian Yearbook. Handbooks and manuals are also classified as reference books, offering concise information on various subjects, with the Guinness Book of World Records being a prominent example. Additional types of reference materials include abstracts, indexes, gazettes, gazetteers, biographies, and bibliographies.

h. Serials, or periodicals, are information resources published in successive installments—whether daily, weekly, monthly, quarterly, or annually with the intention of ongoing publication. These materials are essential in libraries and include journals, newspapers, and magazines. Supporting this assertion, Adedigba (2012) emphasized that periodicals encompass various formats such as newspapers, magazines, journals, newsletters, and annual reports.

i. Government publications consist of all official documents released by various levels of government, including local, state, and federal entities. Additionally, this category includes documents from international organizations such as the United Nations and its agencies, the African Union (AU), the Economic Community of West African States (ECOWAS), the Organisation of Islamic Cooperation (OIC), and the Organisation of the Petroleum Exporting Countries (OPEC). Documents ranked as government publications are published laws, acts of parliament, Military decrees, state edicts, by-laws, and constitutions of countries, correspondences between the three arms of government, books and pamphlets emanating from government.

j. Maps and Atlases: These are another type of print resources available in libraries; maps are drawings and illustrations of the earth's surface usually showing countries, rivers, seas, lakes and mountains. On the other hand an atlas is a collection of maps. Ugwoanyi (2018) pointed that the information library contains variety of information materials such as maps, globes, slide, film, serial etc., which contribute to the general information needs of the library users.

k. Pamphlets and Clippings: A pamphlet is a piece of writing appearing with soft covers that deals with an issue of current interest. It is usually less than 50 pages. Clippings which are pieces of paper cut out from newspapers or magazines. Clippings which are also called cuttings contain very important information of current interest such as job advertisement.

l. Manuscripts: These are books or paper writing by hand or with a typewriter intended for publication. It is from a manuscript that books are subsequently published.

9.8 Non-Print Information Resources

These resources encompass library materials that are not produced in printed form on paper. They exist in various formats beyond traditional books and are often referred to as non-book materials or audio-visual resources. Some of these materials are designed for auditory consumption, while others are intended for visual engagement, and some can be experienced through both senses. As products of modern information technology, non-print information resources cannot function independently like books; they necessitate specific equipment for effective utilization. These resources can be categorized into three main types: audio, visual, and audio-visual. Izang (2013) noted that non-print information resources may be classified as audio-visual or audiovisual materials, which do not rely exclusively on reading for meaning. They can convey information through auditory means, as seen in audio resources, or through visual means, as in visual resources.

(a) Audio Information Resources: These resources are exclusively auditory and cannot be viewed or read. Examples include audio tapes, cassettes, phonograph records, and various sound recordings. Engaging with these resources necessitates proficient listening skills, as this is the sole method for absorbing the information they contain. Most require a radio-cassette player or record player for playback.

(b) Visual Information Resources: These resources are intended solely for visual engagement, lacking any auditory component. Numerous library materials currently in use fall into this category. Examples include:

(i) Transparencies: These materials contain images that are visible only when illuminated. They encompass filmstrips and slides.

(ii) Microforms: These resources present information in a significantly reduced format. Microforms include microfilms, microfiche, and micro cards. Microfilm has proven to be an effective space-saving solution for libraries that are not computerized, as it allows for the storage of back issues of newspapers with minimal spatial requirements. Transparencies necessitate the use of a projector for viewing, while microforms must be properly supported.

	Softwares	**Hardwares**
i. Audio, e.g.	Audio cassette, Audio compound disk, CD, Phornodisks	Tape recorder Disk Player Stereo Player
ii.Video, e.g.	Video cassette Micro Fiche Micro Film Slides Film Strip	Video Player Micro Fiche reader Micro film reader Slides projector Film strip viewer
iii.Audio-Visual e.g.	Compound Disk (CD) Digital Vise tile disk Smart Card DVD Motion film Compound Disk Read Only Memory (CD Rom) Flash drive etc	CD player DVD player DSTV Digital Satellite Television Film Projector Computers Computers
iv. Toys	Toys, games, models, specimens, video games, building blocks, abacus, puzzles, (cross words), step up, Sudoku etc	Manually operated.

9.9 Information Resource Development

The development of information resources encompasses the various materials curated by librarians to address the informational requirements of their clientele. According to the Dictionary for Library and Information Science (2014), this process involves the strategic planning and construction of a well-rounded collection of information resources over time, informed by continuous evaluations of the library users' needs, analysis of usage data, and demographic forecasts. Aina (2014) characterizes information resource development as a critical component of library practice, focusing on the selection and procurement of information materials that empower librarians and information specialists to effectively serve their users. This development can be viewed as a comprehensive process in which information specialists, or librarians, assemble diverse information resources to fulfill the needs of their clientele. The process comprises six distinct elements:

(a) Patron's Community
(b) Community Analysis
(c) Selection Policies
(d) Selection
(e) Acquisition
(f) Weeding
(g) Evaluation

Patron Community: In this study, the term "Patron Community" is utilized in a broad context to encompass the collective group of individuals or information users that the library is designed to serve. This definition extends beyond merely active users to include all individuals within the established boundaries of the community. Akingbe (2019), in the article “Image of Public Libraries in Nigeria,” emphasized the potential

benefits that public libraries can provide to their patrons. He noted that to deliver these services effectively, libraries require sufficient funding, appropriate materials, and skilled personnel. The term "community" can refer to an entire political entity, such as a nation, region, state, province, country, city, or town, as well as more specialized groups, institutions, or associations, including universities, colleges, schools, and government agencies, among others.

Community Analysis: As a social service, the library plays a crucial role in the community it serves, necessitating active involvement from the community to ensure the effective provision and maintenance of library services. Ubogu (2016) asserted that libraries should facilitate access to information resources and provide professional support to ensure the accurate utilization of all library materials and services. It is essential for information resource developers to engage community members in the development of library resources, as this participation allows the community to articulate its information needs. Furthermore, community involvement is vital for promoting the library, particularly in public libraries. It also presents opportunities for community members to contribute through voluntary services, whether through donations or gifts. Consequently, a comprehensive understanding of the community is essential to identify their needs and devise appropriate solutions, indicating that information resource developers must thoroughly analyze the community for effective outcomes.

Selection Policy: This document represents the second and most significant aspect of the information resource development process. It must align with the vision and mission of the parent institution. As an effective guideline, it articulates the categories of information resources that the library intends to acquire in order to fulfill the goals and objectives of its parent institution. The selection policy serves to direct the activities of the information resource developer regarding the types of resources to be integrated into the information resource center, which includes the library, as well as the distribution of resources between print and non-print formats. This policy statement addresses the information resources that need to be conserved, preserved, or removed from the library, outlines the status of gifts and exchanges, and details the patterns and procedures for resource sharing that the library will adopt.

Selection refers to the meticulous process of identifying the least relevant information resources, including non-print materials, to enhance the experience of library users. This process represents the initial phase of developing information resources. It encompasses the recognition of both print and non-print materials that the library will utilize to meet the informational needs of its patrons. The responsibility of selection typically falls to the librarian, who must possess a comprehensive understanding of the target audience, whether they are primary or secondary school students. The information requirements of pupils and students differ significantly from those of university students or research scholars. Consequently, it is essential to ascertain the information needs of the intended users. Selection inherently involves making choices from a vast array of information resources, with millions available for librarians to consider when curating their collections. This necessitates a careful approach to resource selection. Therefore, librarians frequently collaborate with subject matter experts or specialists in various fields. Additionally, selectors should consider the principles of library and information science, as articulated by renowned scholars in the field. Ranganathan (1933) famously stated, "Every reader his book," "Every book its reader," and emphasized the importance of providing the right book to the right reader at the right time

9.10 Acquisition

After identifying the suitable information resources for a library, the subsequent step involves their acquisition. This process can be accomplished through various methods, including purchasing, receiving gifts, engaging in exchanges, and adhering to legal deposit requirements. The purchase method entails the library acquiring books by making financial payments, which can occur through intermediaries, bookstores, or directly from publishers. Gifts refer to instances where individuals or organizations donate books or resources to the library, which may also include bequests gifts specified in a will upon the donor's passing. Libraries may also acquire materials through exchanges, where two or more libraries agree to trade certain resources. Typically, libraries obtain the majority of their information resources through purchases; however, this trend may differ, particularly in developing countries. Due to limited funding, many libraries in these regions increasingly rely on gifts, which can lead to an accumulation of irrelevant and outdated

materials. In Nigeria, the absence of a comprehensive bibliography is attributed to the non-compliance of authors and publishers with the legal deposit law.

The process of weeding information resources involves the systematic removal of materials from the library that are deemed outdated, irrelevant, or no longer meet the needs of users. This task is undertaken by professionals who assess which resources should be discarded. Several factors are taken into account prior to weeding, including the age of the resource and whether its content has been rendered obsolete by more recent editions. Additionally, consideration is given to whether a replacement resource would better serve the users' needs than the one being removed. The primary objective of weeding is to eliminate unnecessary materials from the collection, thereby creating space for more relevant resources and preventing the dissemination of outdated information. This process requires careful decision-making, which can often be challenging. Librarians acknowledge that weeding is as crucial as the acquisition of new information resources.

Evaluation represents the final stage in the development of information resources. While weeding can be seen as an evaluative activity, it primarily functions as an internal library operation. Evaluating a collection can fulfill various purposes, both within the library and externally; for instance, it may enhance funding opportunities, contribute to the library's recognition in comparative assessments, or help gauge the quality of services provided. Moreover, the evaluation of information resources allows the library to identify its strengths and weaknesses, facilitating adjustments to ensure the provision of relevant materials. Library managers must implement a collection development policy that is attuned to the needs of their target users. Ifodon (2019) emphasized that a consistent and well-executed collection development strategy is essential for meaningful progress in library information services.

9.11 Library Services

Library services encompass the procedures employed by library personnel to distribute knowledge and information resources within the library. Fabunmi (2014) noted that these services include traditional offerings such as loan transactions and reading facilities, as well as auxiliary services like binding, photocopying, and current awareness initiatives, which involve selective dissemination of information and maintaining current contacts. Aina (2014) elaborated that general library and information services comprise Lending Services, Inter-Library Loan (ILL), Reservation Services, provision of seating and study facilities, Reference Services, Current Awareness Service (CAS), exhibitions and displays, library publications, user education, library orientation, and information literacy programs. Additionally, various types of libraries offer specialized services to their users, including literature searches, selective dissemination of information, referral services, translation services, extension and outreach services, and rental of premises. He further emphasized that translation services should be provided by supplying materials in a language that the reader can understand, highlighting the necessity for libraries to maintain a roster of professional translators available for assistance as needed.

Afolabi (2014) contends that information and referral services are designed to connect individuals with their needs and relevant service activities. These services typically involve personalized responses to inquiries and require the creation and upkeep of a resource database that clearly outlines the current available resources and pertinent information regarding them. Lee (2015) elaborates that modern information technology should be employed to enhance library infrastructures, which encompasses improved intranet, extranet, and internet systems, as well as software applications that support the collection, analysis, organization, storage, and dissemination of both internal and external information resources. This is essential for fostering effective knowledge exchange among users, resource personnel (such as faculty, researchers, and subject specialists), publishers, government entities, businesses, and other organizations through various channels and layers.

In recent years, numerous newly developed information technologies for database and information/document management have found applications in knowledge management. These technologies include data warehousing, data mining, text mining, content management, knowledge extraction, knowledge mapping, groupware, and information visualization, among others.

In his analysis, Adeyemi (2019) emphasized the essential functions that libraries must fulfill, which include:
a) Ensuring the maintenance of a sufficient collection of monographs and social materials.
b) Engaging in bibliographic activities that encompass:
1. The upkeep of newspaper clippings and vertical files.
i. Providing indexing and abstracting services.
ii. Compiling and developing reading lists, selective bibliographies, indexes to the collection, and other reference aids and resources.
c) Offering reliable reprographic and document delivery services, among other functions.

Library services vary significantly from one institution to another. Typically, the nature of services offered by a library is shaped by the specific organization it serves. For instance, the services provided in educational institutions differ from those in factories, industries, courts, and other entities.

To effectively and efficiently meet user needs in any library setting, librarians must possess a thorough understanding of their clientele's requirements and know how to address them. As noted by Yakubu (2010), the success of any library is contingent upon its capacity to enhance user satisfaction while minimizing the time required for clients to access the information they seek.

9.12 Organization of information resources

The organization of information resources pertains to the arrangement of a library's collection in accordance with the Library of Congress classification system. Oulton and Fisher (2010) noted that organization encompasses the act or process of structuring, thereby forming a systematic assembly of individuals within a group whose officials, agents, and members collaborate towards a shared objective. The organization of information resources is a critical component of librarianship. Ike (2010) emphasized the necessity for proper organization of library collections upon acquisition to ensure that library patrons can effectively access the materials. The process of organizing information includes various tasks such as stamping, labeling, and numbering books for shelving. Additionally, the organization of information resources entails library processing activities, including cataloging, classification, card filing, and bibliography creation, abstracting, and indexing.

Cataloguing

Cataloguing refers to the systematic process of creating entries for a catalogue. A catalogue serves as an organized compilation of books, maps, and various other items, arranged in a specific order. It serves to document, describe, and index the resources within a collection. During the cataloguing process, resources are organized according to established guidelines, allowing users to ascertain the availability of items. Harrod (2017) noted that a catalogue encompasses entries for relevant informational materials found in other sections of the organization or in different libraries. To assist users in identifying the library's holdings, a classified catalogue is made available. This catalogue includes entries categorized by author/title, classification, and subject index.

Classification

Abdulsalami (2013) describes classification as the systematic organization of items based on their similarities, particularly the placement of books within a structured classification system. This system serves to arrange books and other resources in a coherent sequence according to their subject matter or format. It employs a coding framework that utilizes a series of symbols to represent concepts or semantics, adhering to specific relational orders. Classification encompasses any approach to identifying relationships whether generic or otherwise among pieces of information, irrespective of the hierarchical levels involved or whether these methods are utilized in traditional or digital information systems, as noted by Harrod (2017). The process of classification entails assigning a unique number to each book that reflects its subject, thereby grouping related materials together.

Two predominant classification systems have been widely adopted: the Dewey Decimal Classification Scheme, which is characterized by its use of numerical symbols, including digits and decimal points, to maintain the correct organization of materials. This scheme is structured into ten primary classes, each of which can be further subdivided. Additional divisions are achieved by appending decimal points followed by one or more digits.

Bibliography

Bibliography encompasses the systematic organization and listing of books, as well as the writing and creation of books. It represents both an art and a science focused on accurately describing books, their literary content, and their physical characteristics. Harrod (2017) defined bibliography as the science of books, which can be categorized into four distinct areas:

a. Analytical bibliography, which examines the history and description of books;
b. Bibliotheca, which pertains to the collection, preservation, and organization of books within libraries;
c. Enumerative bibliography, which involves the comprehensive listing of various types of books and periodical articles authored by an individual or related to a specific subject, often accompanied by annotations;
d. Practical bibliography, which addresses the methodologies employed by students and others in the compilation of bibliographies.

Furthermore, according to the International Business Market (IBM), bibliography is described as an annotated catalog of documents or the process of creating catalogs or lists.

Abstracting

The process of creating abstracts is typically undertaken by individuals or organizations, whether industrial or commercial, for specific and limited purposes. These abstracts are regularly published and distributed to subscribers. According to Cleveland (2001), abstracting involves crafting a concise and objective summary of document content, allowing users to swiftly assess whether they should engage with the full text to meet their informational needs. An abstract serves as a summary of content and functions as a contemporary bibliography, often summarizing contributions to periodicals and occasionally books. Each abstract is accompanied by sufficient bibliographic details to facilitate the identification of the publications or articles, and they are often organized in a classified manner. Abstracts may be presented in the original language or translated into English or other languages. Journals that exclusively feature abstracts are referred to as abstract journals. Abstracts can be indicative, primarily guiding readers to the original work, or informative, providing substantial details about the original, including key arguments and essential data. They may also be evaluative, offering commentary on the value of the original work (Abdulsalami, 2013).

A general abstract encompasses all the key elements of an article and is created when the interests of readers are diverse and only vaguely understood by the abstractor. In contrast, a selective abstract distills the sections of an article that are specifically relevant to the needs of a particular audience. This type of abstract is typically prepared by a librarian for executives, researchers, and specialists within an organization, or for those who regularly utilize library services. It may also be generated in response to requests for literature searches or to keep the organization’s staff and service users updated on advancements in their respective fields as reported in daily or periodical publications, documents, or reports. As noted by Rowley (2018), the process of abstracting involves summarizing or interpreting a document's content, highlighting key points to assist users in determining whether to consult the original document.

A comprehensive abstracting service endeavors to abstract every publication and article appearing in its subject field, whereas a selective abstracting service selects for abstracting only those publications and articles which it considers are likely to be of use to a specific class of readers. A locative abstract is used solely in a few legal libraries and specifies the place where the original document may be found. Also an. illative abstract is used solely in a few legal libraries and specifies the general nature of the material in the document.

Indexing

Indexing refers to the methodical preparation of one or more indexes. An index serves as a navigational tool for content, presenting a systematically organized list that provides sufficient information for each entry to be located through a page number or another symbol denoting its position within a sequence. According to Lancaster (2011), indexing is a structured approach to the arrangement of entries aimed at assisting information seekers in identifying items within a document.

An index is essentially a comprehensive alphabetical compilation or table of subjects, names of individuals, locations, and other relevant topics discussed or referenced in a book or a collection of books, indicating their precise locations within the volume, typically by page number and occasionally supplemented by additional symbols to denote specific sections of a page, or by entry or number.

In essence, an index functions as a systematic reference guide for locating words, concepts, and various items within publications, documents, and other records. It comprises a series of entries organized in a logical sequence, usually alphabetical, which facilitates easy access for users, along with references that indicate the location of each item.

This text serves as a comprehensive guide to the items included in, or concepts derived from, a particular collection. These items or derived concepts are represented through entries that are organized in a specified, searchable format, such as alphabetical, chronological, or numerical order.

From various perspectives, an index can be considered synonymous with a catalogue. The analytical principles applied are the same; however, while an index entry solely identifies a subject, a catalogue entry provides a detailed description of the document related to that subject.

Indexing plays a crucial role in information retrieval by specifying, indicating, or designating the information, contents, or topics associated with a document or a collection of documents. It also includes a list of names or subjects pertinent to a document or group of documents. This process aids in the creation of an organized or systematic list that delineates the information, contents, or topics within a document or collection of documents. Harrod, (2017).

9.13 Methodology

The study employed a survey research method, which serves both descriptive and exploratory functions. This approach entails the selection and examination of samples from a designated population, ensuring that these samples accurately represent the broader group. The target population for this research consists of DAC students, totaling 2,739 from the 2016/2017 intake, as per the institution's records. A sample size of 10% was utilized, resulting in 274 participants. Data collection was conducted using a questionnaire, and the gathered information was analyzed through descriptive statistics, subsequently presented in tabular format to facilitate percentage calculations.

9.14 Response Rate

A total of 274 questionnaires were distributed among the respondents, with 241 completed copies returned, yielding a response rate of 87.96%.

Table 1: Availability of information resources in DAC library.

	Information resources	NITT library	
		Yes	No
1	Encyclopedias	√	
2	Books on transport, management, logistics, economics, finance etc	√	
3	Dictionaries	√	
4	Serials	√	
5	Computer	√	

6	Periodicals	√	
7	Serials on transport, management, logistics, economics, finance etc	√	
8	Newspapers/magazines	√	
9	Journal	√	
10	Electric typewriter	√	
11	Television	√	
12	Video	√	
13	DVD	√	
14	Projector	√	
15	Internet connectivity	√	
16	Laptop	√	

Table 1 presented the information resources accessible in the DAC library, which are intended for teaching, research, learning, and various other applications, available in both electronic and printed formats. These resources are designed to support the institutional goals and programs. The analysis suggests that electronic information resources serve to enhance the printed information resources.

Table 2: Extent of relevance of the available information resources in DAC library.

S/n	Respondents	Frequency	Percentage
1	Very relevant: Encyclopedias, Books on (transport, management, logistics, economics, finance etc) serials, periodicals, serials on (transport, management, logistics, economics, finance etc), journal newspaper/magazines and internet connectivity.	70	35
2	Relevant: Dictionaries, computer, Television, DVD, video and laptop.	90	45
3	Fairly relevant: Electric typewriter, projector etc	40	20
4	Not relevant	00	00
	Total	241	100

Table 2 indicated that the information resources available in the DAC library, including encyclopedias, books on various forms of transport, serial publications, periodicals, journals, newspapers, magazines, internet access, dictionaries, laptops, television, and video materials, were pertinent to the needs of students, staff, lecturers, researchers, and other users. This conclusion was drawn from the responses provided by the participants in the questionnaire. Specifically, 70 respondents (35%) rated the resources as very relevant, while 90 respondents (45%) considered them to be fairly relevant; notably, no respondents indicated that the resources were irrelevant. These findings demonstrate that the information resources in the DAC library are significant for the program and beneficial to all users, both within and outside the institution.

Table 3: Type of services provided to users in DAC library

	Services enjoyed by users	Yes	No
1	Reference services	√	
2	Lending services	√	
3	Indexing/abstracting	√	
4	Bibliographic notes	√	
5	Selection dissemination of information SDI	√	
6	Photocopying	√	
7	Reading notes	√	
8	Serial materials	√	
9	Internet resources	√	
10	Binding	√	

Table 3 presents the services utilized by the patrons of the DAC library, as indicated by the respondents. The analysis demonstrated that users appreciated these services regardless of their location within the library. This suggests that these services are essential and should be accessible to users at all times.

Table 4: Reasons for using information resources of DAC library

s/n	Reasons for using library	Frequency	Percentage
1	For leisure	2	1
2	For research	110	55
3	For reading notes/handout	38	19
4	For photocopying materials	5	2.5
5	For reading newspapers/journals	5	2.5
6	For writing lecture notes	10	5
7	For borrowing books	5	2.5
8	For doing assignments	25	12.5
	Total	241	100

According to the data presented in Table 4, users of the DAC library reported a variety of reasons for their usage. The primary reason cited for leisure activities was noted by 2 respondents (1%). In terms of research purposes, a significant majority of 110 respondents (55%) affirmed this as their motivation. Additionally, 38 respondents (19%) acknowledged utilizing the library for reading notes and handouts. Furthermore, 5 respondents (2.5%) indicated that they used the library for photocopying materials, while another 5 respondents (2.5%) reported reading newspapers, magazines, or journals. Moreover, 10 respondents (5%) stated that their purpose was to write lecture notes. The borrowing of books was also mentioned by 5 respondents (2.5%), and 25 respondents (12.5%) identified doing assignments as a reason for their library usage. The analysis indicates that the primary functions of the DAC library revolve around research, reading, and completing assignments.

Findings

The analysis of the collected data led to several significant conclusions from the study.

1. The research indicated that the DAC library offers a variety of information resources, including encyclopedias, books covering topics such as transport, management, logistics, economics, and finance, as well as periodicals, journals, serials, newspapers, magazines, internet access, laptops, dictionaries, DVDs, television, and videos related to transport, all available in both electronic and print formats for educational, research, and other purposes.
2. The findings of the study demonstrated that the information resources available at the DAC library in Zaria are both current and pertinent for the students of the Institute and other library patrons. These resources include books on transport, management, economics, finance, and logistics, along with journals, periodicals, encyclopedias, internet access, dictionaries, and serials related to transport, management, logistics, economics, and finance, as well as DVDs, newspapers, magazines, and videos. The study showed that the library offers library services like circulation service, selective dissemination of information, internet, lending services, photocopying, and reference services among other services.
3. The study showed that information resources in DAC library like Encyclopedias, Books on (forms of Transport, management, economics, finance, logistics etc.), and serials on transport, periodicals, journals, newspapers and internet connectivity were used majorly for research, reading and assignments.

Conclusion

The results of the study indicated that the collections within the DAC library were up-to-date, pertinent, and sufficient to fulfill the informational requirements of students and other patrons. It was noted that the library

provided high-quality services aimed at addressing the diverse needs of its users. These services contributed to a more effective and efficient utilization of the resources available in the library.

Recommendations

In light of the findings from this study, the researcher considers it essential to propose the following recommendations:

1. The library should expand its collection of information resources by acquiring additional contemporary materials to accommodate the growing population of students and other users.

2. Outdated resources, such as electric typewriters and certain texts, should be eliminated from the library as they no longer serve the needs of the users.

3. The installation of additional photocopy machines in the DAC library is recommended to improve photocopying services for users.

4. The library should procure current information resources related to various modes of transport, management, logistics, as well as up-to-date journals, periodicals, and internet connectivity to support users in their research, reading, assignments, and other activities.

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CHAPTER TEN

USERS PERCEPTION ABOUT ORIENTATION PROGRAM OF ACADEMIC LIBRARY

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Abstract

This research investigates the awareness of academic library orientation programs and their role in enhancing the performance of undergraduate students. The study highlights the significance of library orientation for both students and academic staff, emphasizing its contribution to understanding effective information usage that supports academic success. Additionally, it aims to raise awareness regarding the social, economic, and educational benefits of library orientation within Nigerian universities. Five research

questions were developed: What do students perceive as the impact of the orientation program provided to them? Does the orientation program address the needs of the students? What effects does the orientation program have on students' academic performance? How does academic library orientation foster and develop undergraduate students' library usage? What challenges are encountered in academic library orientation? The study employed a survey method, distributing 139 research instruments, of which 132 were returned for analysis. The findings indicate that user orientation significantly influences students' academic endeavors. The orientation program familiarizes students with the libraries available at the university, detailing the information resources and services offered, as well as how to access and utilize them effectively. It notably enhances and promotes library usage among students in their educational pursuits. Furthermore, the study identifies challenges related to the program, including the presence of unqualified personnel, insufficient time allocated for the program, a lack of a unified curriculum among universities, and uncooperative attitudes from some staff members. In conclusion, user orientation and instruction are essential in all tertiary institutions in Nigeria, as they help patrons maximize their library usage, fostering self-motivation and independence among users.

Keyword: Orientation Program, Academic Libraries, Impact, Academic Performance, Undergraduate Student

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10.1 Introduction

An orientation program in academic libraries serves as a crucial touchpoint for new students, faculty, and staff to familiarize themselves with the library's resources, services, and policies. The purpose of such programs is to help users navigate the library effectively, utilize its tools and databases, and engage with its staff for academic success. Academic libraries, as integral parts of the educational infrastructure, are pivotal in shaping the information literacy of their users. With technological advancements and the growing shift towards digital resources, libraries are evolving, and so must their user education programs.

The users' perception of these orientation programs plays an important role in determining their effectiveness. Positive perceptions can lead to higher levels of engagement with library resources, while negative perceptions may discourage users from utilizing these resources to their fullest potential. As universities evolve and student populations diversify, understanding how users perceive and benefit from library orientation programs is essential for libraries to tailor their services and ensure that users receive the maximum benefit.

In this paper, we will examine users' perceptions of academic library orientation programs. Specifically, we will explore how these perceptions influence their interaction with library services and resources, how orientation programs impact their information-seeking behaviors, and the challenges and improvements for these programs.

10.2 Statement of Problem

The majority of students at Federal University Lafia, particularly undergraduates, hail from various regions of Nigeria and often possess limited knowledge regarding library systems and classification methods for their resources. The orientation program aims to provide insights into the resources available, highlighting that the university employs the Library of Congress Classification Scheme (LCCS) for the effective organization of its information resources. As an academic library, the collections are categorized into divisions, specifically (A-H, J-P, Q-Z). A central catalog cabinet is maintained to facilitate access to the library's collections. The Federal University Library is tasked with conducting an annual orientation program for newly admitted students. However, observations indicate that many undergraduate students struggle to locate the appropriate areas within the library, often taking considerable time to seek assistance. Even when directed, they frequently fail to navigate the shelves effectively to find the specific materials they require. Consequently, they tend to visit the library with their notebooks for study purposes without utilizing the available information resources. This raises the question of whether the shortcomings in the orientation program provided by the library may be contributing to this issue.

10.3 Objective of the Study

This research seeks to investigate users' perceptions regarding the library orientation programs at the Federal University of Lafia. The specific objectives include:

1. To assess users' perceptions of the library orientation programs.
2. To evaluate how the orientation programs are designed to address students' needs for effective information utilization.
3. To analyze the impact of orientation programs on students' academic performance.
4. To identify the challenges faced in academic library orientation.
5. To propose solutions to the challenges encountered in academic library orientation.

10.4 Research Questions

The following research questions have been formulated to collect data for this study:

1. How do users perceive the library orientation programs?
2. Do the orientation programs effectively meet the needs of the students?
3. What effects do orientation programs have on students' academic performance?
4. What challenges are present in academic library orientation?
5. What solutions can be proposed to address the challenges in academic library orientation?

10.5 Literature Review

Several studies have examined the importance of library orientation programs in academic settings and how they influence user behavior. The literature reveals varying levels of satisfaction and engagement with these programs, often highlighting both strengths and weaknesses in their design and implementation.

Effectiveness of Orientation Programs

One of the core functions of orientation programs is to familiarize users with library resources. According to a study by Bennett and Merton (2014), library orientations that effectively communicate available resources and services lead to increased usage and satisfaction. The study found that students who participated in comprehensive orientations were more likely to utilize library databases, attend workshops, and seek help from library staff when needed.

User-centric design of these programs has been emphasized in several studies. According to Johnson (2017), an orientation program that is tailored to meet the needs of a diverse student body, including international students, first-year students, and graduate students, can lead to better engagement. When orientations address specific user needs, such as digital literacy for international students or advanced research tools for graduate students, users tend to perceive the program as more valuable and relevant.

However, Kumar and Sunder (2018) note that the traditional model of library orientation, which often includes lectures and introductory tours, may not be as effective in the digital age. They argue that modern orientations should incorporate more interactive elements, such as hands-on workshops, online modules, and social media engagement, to appeal to today's tech-savvy student population.

Challenges and Gaps in Library Orientation

Despite the general positive feedback regarding orientation programs, challenges exist. A common criticism is the lack of personalization in some programs. Many orientations are generic and do not cater to the unique needs of different academic departments or user groups. Singh and Kumar (2020) found that

students who participated in standardized orientations often felt overwhelmed and disconnected from the content, particularly when the information presented was not relevant to their immediate needs. Personalization, they argue, is crucial for increasing the perceived usefulness of these programs.

Another challenge highlighted in the literature is the lack of follow-up after the orientation. According to Choi (2019), some libraries fail to maintain engagement with users after the initial orientation session, leading to a disconnect between what users learned in the session and their ongoing usage of library services. Choi recommends periodic check-ins, reminders, and follow-up workshops to reinforce learning and ensure that users continue to benefit from library services.

Technology and Online Orientations

The rise of online learning and remote students has led many libraries to incorporate technology into their orientation programs. Jones and Lee (2021) conducted a study on virtual orientations and found that online programs can be equally, if not more, effective than in-person orientations. They argue that virtual orientations offer flexibility for users who cannot attend in person due to scheduling conflicts or distance. However, they also note that virtual programs need to be well-structured, with clear instructions and engaging content, to avoid disengagement.

Another significant advantage of online orientations is the ability to track user engagement and gather feedback. Miller et al. (2022) suggest that libraries can use analytics from online orientation modules to understand which sections are most popular and where users are dropping off, allowing for targeted improvements.

User Perceptions and Satisfaction

The overall **user perception** of library orientations is a key indicator of their effectiveness. Studies by Raju and Binu (2020) show that satisfaction with orientation programs correlates strongly with the perceived utility of the library. Users who report higher satisfaction with the orientation are more likely to continue using the library throughout their academic careers. Positive perceptions can also increase the likelihood that students will recommend the library services to their peers.

Conversely, negative perceptions of the orientation can lead to lower levels of engagement. Arunachalam and Narayana (2021) found that users who were dissatisfied with the orientation program felt that it was either too brief or too complicated, and they were less likely to seek help from library staff or use the library's resources regularly.

Future Directions

In the future, libraries are likely to continue integrating technology-driven solutions into their orientation programs. As Kaur et al. (2023) emphasize, libraries should leverage augmented reality (AR), gamification, and interactive online platforms to create engaging and educational experiences. Additionally, inclusivity will remain a central focus, ensuring that orientation programs cater to a diverse range of students and their specific needs.

The literature highlights the significant impact that well-designed orientation programs have on user engagement with academic libraries. Effective orientation programs not only introduce users to library resources but also foster positive perceptions and behaviors that can lead to long-term usage and academic success. However, challenges such as the need for personalization, follow-up, and the incorporation of technology remain central to improving these programs. Moving forward, academic libraries must continue to evolve their orientation strategies to meet the changing needs of their user base and to enhance the overall user experience.

10.6 The Need for Orientation Programs in Academic Libraries

Orientation programs in academic libraries serve as an essential bridge for new students, staff, and faculty members to transition into the academic environment. These programs provide crucial guidance on how to effectively use library resources, services, and facilities, thereby enhancing users' academic performance and research capabilities. The importance of library orientation has increased in recent years due to a number of evolving factors, such as the increasing complexity of information resources, the integration of technology, and the diverse student population in contemporary higher education settings.

1. Navigating Complex Library Resources

One of the primary reasons for implementing library orientation programs is to help users navigate increasingly complex library resources. Libraries today house not only physical collections, but also vast digital repositories, databases, e-journals, and digital learning tools that require specific knowledge to use effectively. As Kaur et al. (2023) note, academic libraries have transformed into dynamic, multi-platform learning hubs, requiring users to possess advanced information literacy skills to search, access, and utilize these resources. For many new students, especially those coming from high school environments with fewer digital resources, this can be overwhelming.

Library orientation programs, therefore, play a critical role in introducing new users to the layout of the library, demonstrating how to search for materials, and providing instruction on how to use library databases, citation tools, and reference management systems. For example, orientations often teach students how to use systems like *Interlibrary Loan*, *Discovery Services*, and subject-specific databases, which are not commonly used outside the academic setting. In this way, library orientations help to demystify these resources, ensuring that students do not feel lost or intimidated by the complexity of academic libraries (Bennett & Merton, 2014).

2. Enhancing Information Literacy and Research Skills

Information literacy is one of the cornerstones of academic success, and library orientation programs are a key part of fostering these skills. Jones & Lee (2021**)** emphasize that students must be equipped with the ability to find, evaluate, and use information effectively in an academic context. Library orientations are often the first step in this process, as they teach users how to critically engage with various information sources and tools. This is particularly important in today's digital age, where vast amounts of information are available online, and students must develop the ability to discern credible sources from unreliable ones.

Orientations often include sessions on information retrieval, reference management, academic integrity, and plagiarism prevention. By providing students with these essential skills, library orientation programs contribute significantly to their academic success and help them become more independent learners. Arunachalam & Narayana (2021) argue that information literacy programs, which are increasingly integrated into library orientations, empower students to become proactive in their research, thus improving their overall academic performance.

3. Supporting Diverse User Groups

The growing diversity in student populations encompassing international students, first-generation students, and non-traditional learners requires that orientation programs be tailored to meet varied needs. As Singh & Kumar (2020) highlight, not all students enter academic libraries with the same level of prior knowledge or comfort with library services. International students, for instance, may face language barriers or be unfamiliar with local research practices and academic writing norms. In such cases, library orientations that offer language support, cultural adaptation sessions, or specific resources designed for international students can help ease their transition.

Similarly, non-traditional students such as working professionals or adult learners—may have different expectations and challenges when using library services. Offering flexible orientation formats, including online tutorials or self-paced modules, can ensure that all user groups are accommodated and able to access library services at their own convenience (Johnson, 2017).

4. Promoting Library Engagement and Usage

Many students, particularly those in the early stages of their academic careers, may not initially see the library as a key resource for their studies. According to Choi (2019), the absence of an orientation program can lead to low engagement with library services, as students may not fully understand what the library offers or how it can support their academic needs. Through orientation, libraries create awareness and generate interest among students, encouraging them to use library resources more frequently.

The initial exposure to library services in a structured manner can help break down the barriers that students face when trying to engage with the library. Kaur et al. (2023) argue that students who attend orientation sessions are more likely to perceive the library as a valuable resource and use it regularly for both academic and extracurricular purposes. Library orientations thus contribute to the development of a long-term relationship between students and the library, enhancing their academic experience and overall success.

5. Adapting to Changing Technological Environments

In recent years, technological advancements have dramatically changed the landscape of academic libraries. The integration of digital tools, online resources, and virtual learning platforms has become essential in ensuring that libraries stay relevant and accessible. The rapid shift to digital libraries and e-learning platforms, accelerated by the COVID-19 pandemic, highlights the need for orientation programs to adapt. Miller et al. (2022) note that as more library services are provided online, students need orientation programs to help them navigate these digital spaces, familiarize themselves with online databases, e-resources, and remote access tools.

Moreover, as more students engage with library services through mobile apps, virtual reference desks, and other digital channels, there is an increased need for orientation programs to incorporate these technological tools. Online orientations, which can be accessed remotely, allow libraries to provide continued support to users, particularly those who may be unable to attend in-person sessions due to distance or scheduling constraints (Jones & Lee, 2021).

6. Promoting Academic Integrity and Responsible Use of Resources

Another critical aspect of library orientations is their role in promoting academic integrity. Kumar & Sunder (2018) highlight that library orientations are an effective way to inform students about the importance of using resources ethically and avoiding plagiarism. Through orientations, students can learn about citation styles, the ethical use of information, and tools such as plagiarism checkers. Academic integrity is central to the university experience, and library orientations help establish these values early on, fostering a culture of responsible research.

The need for library orientation programs in academic settings has become more pressing as academic libraries continue to evolve and as student populations become increasingly diverse. These programs play a key role in helping students navigate complex library systems, build essential information literacy skills, and promote ongoing engagement with library resources. Furthermore, orientation programs serve to acclimate students to academic expectations, foster ethical research practices, and support academic success. Given the growing importance of digital tools and the changing needs of students, libraries must continue to innovate and adapt their orientation programs to ensure they remain relevant and effective in supporting students throughout their academic journeys.

Some of the benefits are as identify below:

1. Creation of better interest for library clients
2. Enhancement and effective library resources usage.
3. Librarian and user's time are saved
4. Better understanding of the library rules and regulation

The interaction between users and librarians experiences reduced friction, which typically stems from communication issues. Consequently, a significant portion of the librarian's time will be dedicated to the delivery of technical services. In essence, user education acts as a guide, aimed at preventing users from becoming overwhelmed by the vast amount of information available to them. Moreover, as noted by Abdulsalami, the library serves as a venue for independent study, where users can locate, assess, utilize, compare, and evaluate information for academic purposes. Therefore, it is essential to implement all necessary tools that will foster interest and enthusiasm among students, thereby promoting library usage. In this context, user education enhances independence and proficiency in information retrieval and the effective use of library resources.

10.7 Challenges against Positive Impact of Academic Library Orientation Program

While academic library orientation programs are generally seen as a valuable means of familiarizing students with library resources, there are several challenges that can hinder their effectiveness. These challenges can range from logistical and structural issues to the inability to meet the diverse needs of a student body. In some cases, these barriers may diminish the positive impact of such programs, leading to lower engagement, decreased satisfaction, and less frequent use of library resources. This section explores some of the key challenges facing academic library orientations and their impact on program outcomes.

1. One-Size-Fits-All Approach

A common challenge with many library orientation programs is their **generic nature**, where the content is designed to cater to a broad group of students, often without sufficient consideration for the diverse needs of specific user groups. As Singh & Kumar (2020) observe, students come to the library with varying levels of familiarity with academic resources and differing needs. For example, graduate students may require more advanced research skills and access to specialized databases, while first-year students might need basic navigation skills. Likewise, international students may require additional support in adapting to a new educational system and using English-language resources effectively.

When orientations fail to account for these distinctions, the program may feel irrelevant or inadequate to many students. Choi (2019) found that students who attended general orientation sessions often reported feeling disengaged because the material presented did not match their academic stage or personal needs. Customizing orientations to different academic levels or user profiles can be resource-intensive, but it can significantly enhance the perceived value and usefulness of these programs.

2. Time Constraints and Scheduling Issues

Another major challenge is the limited time available for conducting effective orientations. Orientation programs are often scheduled at the beginning of the academic semester, and students may feel overwhelmed with other activities and responsibilities, such as meeting faculty, settling into dorms, and adjusting to their academic workload. In such cases, library orientations may be seen as an optional or low-priority event.

Miller et al. (2022) highlight that time constraints can make it difficult for students to absorb all the information presented during the orientation, which could lead to confusion or a lack of retention. For example, a one-hour session might not be sufficient to cover everything a student needs to know about navigating the library, accessing digital resources, or using library services effectively.

To address these constraints, libraries have increasingly offered online orientations, but even these can have their own limitations, such as reduced interaction with librarians or lack of engagement with the material. Kaur et al. (2023) argue that virtual orientations, though flexible, often lack the personal touch that in-person orientations provide, potentially making them less effective in fostering long-term engagement with library services.

3. Lack of Follow-Up and Reinforcement

A significant gap in many library orientation programs is the lack of follow-up. According to Choi (2019)**,** orientations are often viewed as a one-time event, and students do not always revisit the information once they have attended. As a result, students may forget crucial aspects of what they learned, such as how to access certain databases or who to contact for research help. Without adequate reinforcement, these students may struggle to make the most of library resources in the future, even if they initially showed interest in the orientation.

Regular follow-up could take the form of emails, refresher sessions, or even personalized one-on-one help. Bennett & Merton (2014) argue that successful orientation programs often include a feedback loop and continued engagement throughout the semester, offering resources that help students apply their learning to real research tasks. Such follow-up would make orientations feel more integrated into the students' academic life rather than an isolated event.

4. Overloading Students with Information

Library orientations often cover a wide range of topics, including library services, research tools, citation guides, and ethical use of information. While this is essential information, overloading students with too much content in a short time frame can be counterproductive. Kaur et al. (2023) highlight that when orientations are packed with too many details, students may become overwhelmed, leading them to disengage or forget important aspects of the session.

When students are overwhelmed, they may tune out the information, and consequently, fail to absorb the content that is most relevant to their immediate needs. This issue can be exacerbated in virtual orientations, where students may not have the opportunity to ask questions or clarify doubts immediately. To combat this, many libraries are now adopting modular formats**,** where content is broken down into smaller, more digestible pieces that students can access over time. This can improve retention and engagement, allowing students to learn at their own pace.

5. Insufficient Staffing and Resources

Another challenge to the success of library orientations is the insufficient staffing and resources dedicated to these programs. A lack of trained librarians or support staff can result in poorly executed orientations that fail to engage students or provide the necessary information. Jones & Lee (2021) argue that library staff need to be adequately trained in facilitating orientations, particularly as students increasingly expect personalized, technology-driven experiences.

Libraries that lack the resources to implement these programs fully may rely on volunteers or part-time staff, who may not have the expertise or the time to deliver an impactful orientation. Furthermore, some libraries may lack the funding to offer high-quality multimedia resources or to develop online platforms for virtual orientations. The ability of libraries to create engaging, interactive, and personalized orientations is therefore often constrained by their available budget and staffing.

6. Student Disengagement and Lack of Motivation

Even when library orientation programs are well-designed and well-executed, student disengagement remains a persistent issue. As noted by Arunachalam & Narayana (2021), many students approach library orientations with indifference, seeing them as an unnecessary requirement or as something that can be skipped. This lack of motivation to participate in the orientation process can be compounded by a lack of perceived value in library services.

Students may not immediately see how library resources will impact their coursework or research, especially in disciplines that do not seem to heavily rely on library materials. Singh & Kumar (2020) found that students who were already adept at using digital tools or had prior experience with academic libraries were less likely to engage meaningfully with orientation programs. This disengagement can undermine the positive impact that orientations are intended to have.

7. Technological Barriers in Virtual Orientations

With the increasing shift toward virtual orientations, especially after the COVID-19 pandemic, another challenge arises in terms of accessibility and technological limitations. Kumar & Sunder (2018) point out that some students may not have reliable internet access, appropriate devices, or the technical skills to engage with virtual orientations. This can create disparities in the effectiveness of orientations, particularly for students in underrepresented or economically disadvantaged groups. While virtual orientations offer flexibility, they are not universally accessible, and this lack of accessibility can negate their positive impact.

While academic library orientation programs are essential for fostering student engagement and helping users navigate complex library resources, several challenges can undermine their effectiveness. These include a one-size-fits-all approach, time constraints, and lack of follow-up, information overload, insufficient staffing, and student disengagement. Addressing these challenges requires careful planning, sufficient resources, and a focus on making orientation programs more personalized, interactive, and accessible. By overcoming these obstacles, academic libraries can ensure that their orientation programs have the positive impact they are intended to have, helping students make the most of the library's resources and supporting their academic success.

10.8 Solutions to the Problem

In order to address the various challenges associated with user education, it is essential for librarians and educators to engage in comprehensive planning and implementation when developing an appropriate curriculum that supports an effective user education program. Accordingly, it is crucial to acknowledge the recommendations put forth by Abdulsalami et al. (2014), which include the following solutions:

The library should enhance its capacity by employing qualified personnel capable of effectively managing the demands of user education within our higher education institutions. There should be a reduced dependence on short-term initiatives, such as library orientation, as these cannot serve as substitutes for comprehensive user education. It is imperative that head librarians in tertiary institutions devise a credible program that will persuade regulatory bodies, such as the NUC, NBTE, and NCCE, to endorse the establishment of user education as a credit-bearing course available to all students, ideally during their first semester.

It is essential for librarians, particularly through the Nigerian Library Association, to engage actively in the political landscape of education in Nigeria. This engagement is crucial for addressing the numerous challenges faced by the profession of librarianship. Furthermore, user education should be integrated into the curriculum of library schools. Ultimately, to ensure that user education has a lasting impact on students, it is important to implement concepts that are user-friendly and free from excessive technical jargon.

10.9 Methodology

The study population consists of two thousand seven hundred eighty-one (2781) undergraduate students from the 2016/2017 academic year, as reported by the Directorate of Academic Planning. A simple random sampling method was employed for this research. According to Aron and Bernard (2012), when the total population ranges from 1 to 1000, a sample size of 20% is appropriate, while for populations between 1001 and 10,000, a 5% sample is recommended. Given that the respondent population is 2781, 5% of this figure amounts to 139, which serves as the sample size for the study. A questionnaire was utilized as the primary data collection instrument, specifically employing closed-ended questions. The data gathered will be categorized and subsequently transformed into frequency distributions and percentage tables to facilitate comparisons and highlight differences. The generated percentages and frequencies, along with the tables, will be instrumental in elucidating the study's findings and will contribute to the conclusions drawn from the research.

10.10 Response Rate

A total of one hundred thirty-nine (139) research instruments were distributed, and 132 copies were retrieved for analysis. The response rate is presented in Table 1 below.

Table 1: What is your Perception on the Orientation Program given to you by FUL Librarians?

N/S	Perception	Frequency	Percentage
1	Useful	70	53.03
2	Very Useful	62	46.96
3	Not Very Useful	Nil	
4	Not Useful	Nil	
	Total	**132**	**100**

Table 1 presents the students' responses regarding their perceptions of the effects of the orientation program. A total of 70 respondents, representing 53.03%, expressed agreement that the orientation program is beneficial, while 62 respondents, or 46.96%, indicated that it is highly beneficial. This suggests that students believe that a well-implemented orientation program can enhance the research and reading culture.

Table 2: How orientation program are designed towards helping the need of students' on information utilization?

S/NO	Information Utilization Programs	Frequency	Percentage
1	It educates and enlighten students	35	26.51
2	Is designed towards helping the need of users	51	38.63
3	It builds good library culture into the students	42	31.81
4	Others.	4	3.03
	Total	**132**	**100**

The data presented in Table 3 indicates that 51 respondents, representing 38.63%, expressed satisfaction with the effects of library orientation, citing its role in educating and enlightening students while addressing their reading and research requirements. Additionally, 42 respondents, or 31.81%, believe that the orientation fosters a positive library culture among students. Furthermore, 36 respondents, accounting for 26.51%, assert that the library orientation program effectively educates and enlightens students. Notably, 2 respondents, or 3.03%, did not provide any feedback. It is important to note that there has been a decrease in user queries, alongside an increase in users' confidence in utilizing library resources and services. From this analysis, it can be concluded that library orientation has had a beneficial impact on students, as the majority of respondents acknowledged its support for their reading and research needs.

Table 3: impact of orientation program on student's academic performance.

S/NO	Impacts to academic performance	Frequency	Percentage
1	Improves student's learning skills	35	26.51
2	It creates awareness of how to use the library	24	18.18
3	It provides basis for self-evaluation	21	15.90
4	Orientation confirms students access to and interaction with library system	32	24.24
5	It inculcates individual spirit of enquiry	20	**15.15**
	Total	132	**100**

Table 3 illustrates the students' responses regarding the enhancement of academic performance resulting from library orientation. The discussion topics have played a significant role in shaping students' perspectives. According to the survey, 35 respondents (26.51%) affirmed that the orientation enhances students' learning skills and aids in research activities. Additionally, 32 respondents (24.24%) expressed that the orientation facilitates students' access to and engagement with the library system, while 24 respondents (18.18%) indicated that it raises awareness about effective library usage. Overall, this observation strongly suggests that orientation programs positively influence academic performance in various ways. Furthermore, 21 respondents (15.90%) concurred that the orientation provides a foundation for self-evaluation, and 20 respondents (15.15%) confirmed that it fosters an individual understanding of the impact of the orientation program on students' academic success. In summary, a well-structured orientation enhances students' capabilities and knowledge regarding library usability, as evidenced by the favorable feedback from respondents. It also promotes students' utilization of library resources in their academic endeavors.

Table 4: the challenges affecting the delivery of effective library orientation?

S/N	Challenge	Frequency	Percentage
1	Use of unqualified personnel	36	27.27
2	Inadequate time to treat all program	46	34.84
3	Non collaborative attitudes of some staffs	20	15.15
4	Lack of collective curriculum amongst tertiary institutions	30	22.72
	Total	**132**	**100**

The challenges associated with the effective delivery of library orientation are outlined in Table 4 above. Data collected from a total of 46 respondents, representing 34.84%, revealed that insufficient time to cover all aspects of the program was a significant concern. Additionally, 36 respondents, or 27.27%, identified the employment of unqualified personnel as a notable challenge. Furthermore, 20 respondents, accounting for 15.15%, acknowledged that the non-collaborative attitudes of certain staff members hindered progress, while 30 respondents, or 22.72%, pointed out that the absence of a unified curriculum among tertiary institutions poses a serious obstacle.

From the analysis presented, it is evident that the primary challenge impacting the effective delivery of library orientation is the lack of adequate time to address all program components. The library, as an organization, encompasses numerous activities, and the constraints of time do not allow for the comprehensive treatment of all necessary elements within the program.

Table 5: Solutions to the Problems

S/No	Solutions To The Challenge	Frequency	Percentage
1	Qualified personnel should be recruited	33	25
2	Librarian should allocate adequate time for orientation program	55	41.66
3	There is need to have staff collaborative efforts	24	18.18

4	Collective curriculum should be put in place	20	15.15
	Total	**132**	**100**

The table presented above illustrates the feedback from students regarding the solutions to the challenges faced during library orientation. A total of 55 respondents, representing 42%, recommended that librarians should dedicate sufficient time to the orientation program. Additionally, 33 respondents, accounting for 25%, suggested the recruitment of qualified personnel. Furthermore, 24 respondents, or 18%, emphasized the necessity for collaborative efforts among staff, while 20 respondents, making up 15%, advocated for the establishment of a collective curriculum.

In light of the overall feedback from the respondents, it is imperative that librarians allocate an adequate and convenient timeframe for the orientation program and ensure the availability of qualified personnel. This approach will facilitate the coverage of essential components of the program.

Finding

From the findings the below observations were made:

i. Student Perception of Orientation's Impact: This research indicates that a significant majority of students are both aware of and participate in the orientation program, which has proven to be beneficial for their fundamental academic endeavors. Furthermore, it was observed that all activities undertaken at the university are closely linked to the library.

ii. Importance of Orientation: The findings highlight the critical necessity of implementing an orientation program. It is essential that such a program is primarily structured to assist students in effectively utilizing library resources and services independently. Additionally, the data suggests that the program should focus on educating users on how to address their information needs.

iii. Student Perception of Orientation's Impact: This research indicates that a significant majority of students are both aware of and participate in the orientation program, which has proven to be beneficial for their fundamental academic endeavors. Furthermore, it was observed that all activities undertaken at the university are closely linked to the library.

iv. Importance of Orientation: The findings highlight the critical necessity of implementing an orientation program. It is essential that such a program is primarily structured to assist students in effectively utilizing library resources and services independently. Additionally, the data suggests that the program should focus on educating users on how to address their information needs.

Conclusion

Libraries serve as the primary repositories of information essential for ongoing education within higher education institutions, particularly universities. Given their strategic significance, the likelihood of individuals failing to access the appropriate information at the right time is considerably high. In an age characterized by information overload, where data is often inundated upon users (the push factor), one must question the necessity of libraries and librarians if unrestricted access to information is permitted. This situation underscores the importance of obtaining high-quality information. Librarians play a crucial role in evaluating the authenticity of information to ensure it meets scholarly standards.

To achieve the objectives of various libraries, it is imperative that users receive guidance on the effective utilization of resources to maximize their benefits. This necessitates a well-structured user education program tailored to the diverse needs of library patrons.

Nevertheless, considering the evident challenges associated with user orientation, it is reasonable to assert that the success of library literacy in tertiary institutions hinges on the presence of skilled personnel who possess effective teaching methodologies and a strong orientation towards education.

Recommendations

The following suggestions are proposed to enhance student orientation at the Federal University of Lafia (FUL). The findings indicate that, in light of the overall academic performance of students at the university, FUL should take on the responsibility of sustaining the positive impact of its orientation programs, particularly in facilitating students' access to library resources essential for their academic requirements. In any efforts to organize orientation sessions, it is highly advisable for the library to conduct a survey or community analysis targeting the university community as the audience for data collection.

This survey should be designed to assess students' prior levels of information needs, their current and future information-seeking behaviors, and their strategies for seeking information, among other factors. Upon completion of this survey, it is anticipated that the results will inform the determination, development, and implementation of the goals and objectives for the orientation program.

In continuation of the previously recommended strategy, it is essential to place greater emphasis on prioritizing, ensuring, and actualizing the orientation process to positively influence the enhancement of students' academic performance. Additionally, facilitating proper library usage is crucial, as students cannot achieve independence due to the inherent complexities of information organization within the system.

Any educational approach related to orientation should be straightforward and strategic. Utilizing available resources, such as instructing students on how to navigate catalogue cards or OPAC, must be designed for ease of use and flexibility. This will promote sustained and frequent library engagement while minimizing barriers and reducing monotony.

Addressing the identified challenges of effective user orientation is both urgent and necessary. Human resources play a pivotal role in determining the success of an organization. Effective management of these individuals should focus on coordination and collaboration to achieve shared objectives, which will significantly aid in mitigating the challenges associated with library orientation.

Ultimately, it is essential to enhance the library by employing qualified personnel capable of effectively addressing the challenge of user education at FUL, Lafia. For user orientation to have a meaningful impact on students' lives, it is imperative to implement concepts that are user-friendly and free from excessive technical complexities.

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CHAPTER ELEVEN

THE APPLICATION OF SOCIAL MEDIA (ICT) AS A CAMPAIGN STRATEGY FOR PREVENTION OF DRUG ABUSE AMONG UNDERGRADUATE STUDENTS OF IGBINEDION UNIVERSITY OKADA

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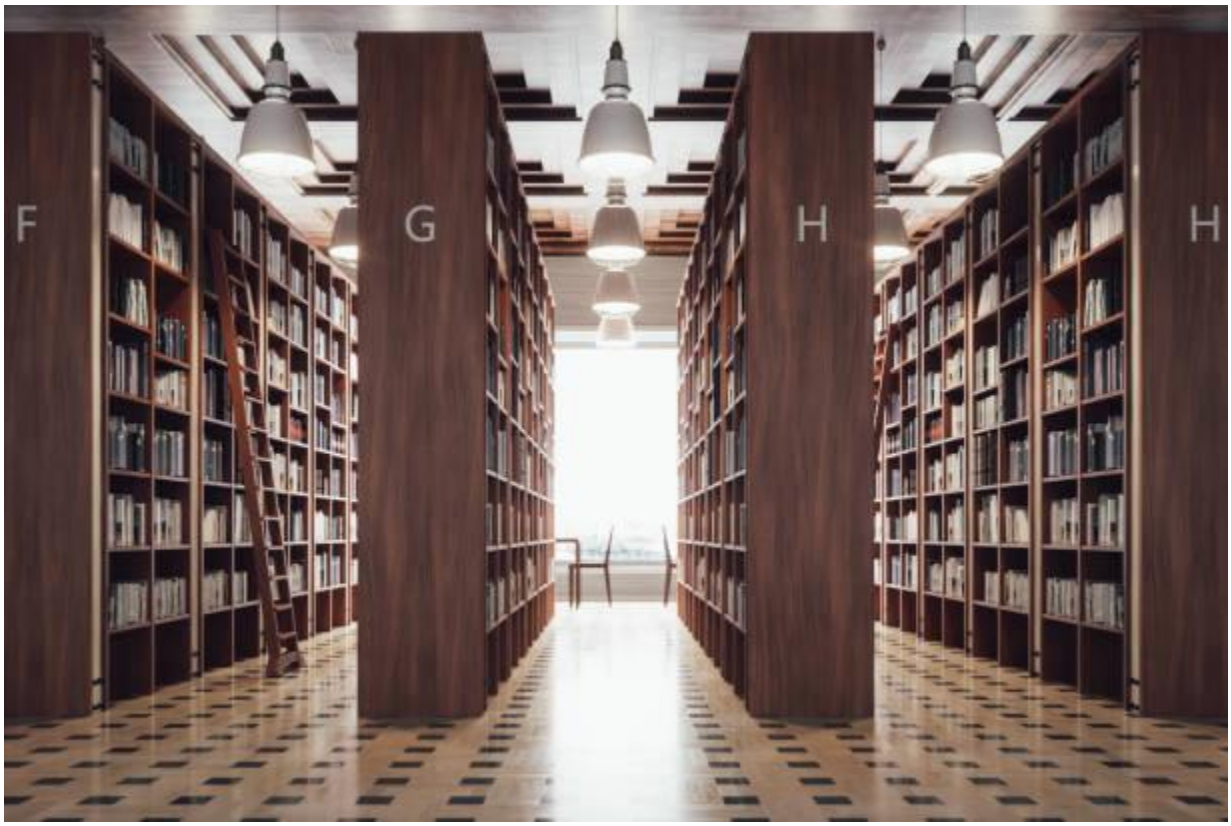

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By

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Abstract

This research work discusses the Application of Social Media as a Campaign Strategy for Prevention of Drug Abuse among Undergraduate Students of Igbinedion University Okada, three objectives were raised in the research which includes; to identify the campaign strategy to prevent drug abuse among undergraduate students in Igbinedion University, Okada, to identify associated facilities that could be used to prevent drug abuse among undergraduate students in Igbinedion University, Okada, and to proffer strategies to overcome the problems associated with the use of the facilities in the prevention of drug abuse among undergraduate students in Igbinedion University, Okada (IUO). Related literatures were reviewed and discussed; survey research method was adopted for the research work, students of Igbinedion University, Okada, formed the population of the research. A stratified sampling technique was used and 108 (IUO) students were sampled, questionnaire was use as instrument for data collection, data collected was sorted out and analysed using percentage of the respondent to interpret the questionnaire. The finding revealed the type of I.C.T facilities that can be used in the prevention of drug abuse by students of Igbinedion University, Okada, such as computer, E-mail, internet, telephone etc. It can be concluded that there is a growth in the use of I.C.T facilities in the prevention of drug abuse among student. The researcher recommended the provision of adequate and functional I.C.T facilities for the prevention of drug abuse;

Keywords: Abuse, I.C.T, Prevention, Drug, Use, *Social Media, Campaign Strategy*

11.1 Introduction

The alarming evidence in the prevalence of drug abuse, the effects and consequences of substance abuse among students has called for concern and challenge to all helping professions to mount strategies of equipping youths with skills of living devoid of substance abuse. In Nigeria today, the consequences of substance use are diverse, including acute and chronic health, social as well as psychological problems. The problem of drug abuse among university students in Nigeria is a recognized phenomenon (Adelekan, Abiodun & Ogunremi, 2012) and the alarming rate of this problem is such that it may be regarded as one of the greatest problem in contemporary Nigerian society (NDLEA, 2003). Consequently, drug abusers are known to demonstrate various forms of deviant behaviour and organized crimes including truancy, cultism, and examination misconduct and high risk sexual behaviour, among others.

According to Goode (2013), a drug may be defined as any licit or illicit substance that when swallowed, smoked, sniffed or injected influences the function and operation of the body and mind. In other word, a drug as any chemical substance that by its chemical nature affects the structure and functions of a living organism. This includes virtually all types of materials and substances including food, ingested, inhaled or injected into the body. From these definitions, it is obvious that heroin, cocaine, marijuana, barbiturates, amphetamine, alcohol, coffee and cigarettes are classified as drugs.

Drug abuse refers to the misuse or wrong use of drugs which have adverse effects on the central nervous system, mind, mood, behaviour and personality of the individual (Dewan, 2012). In the same vein, it is the use of any drug to the point where it interferes with an individual's health or with his economic or social adjustment. Omolade (2013) opines that drug abuse involves self-administration of drug in a manner that deviates from the approved medical and social patterns within a given culture.

The effects of drug abuse among University students in Nigeria cannot be under estimated. According to Osarenren (2012), truancy and absenteeism are among the effects of drug abuse. Truancy occurs when students stay away from school or academic activities regularly without permission while absenteeism is when there is a high rate of absence from school or academic activities when regular attendance is required. These problems are indications of adolescent rebellion, self-assertion, perceived poor academic achievement or maladjustment which are traceable to drug abuse (Falaye & Gesinde, 2013). Other effects are cultism, armed robbery and Organized Crimes. Drug abuse gives students a false sense of security and self-confidence. As a result, these adolescents take to different types of crime including kidnapping, rape and armed robbery. All these are manifestations of deliberate indulgence and issues that spurred the

researchers to attempt to investigate the possible ways to prevent student from drug abuse and deviant behaviour among university undergraduates in the University, particularly Igbinedion University, Okada, Nigeria. The research seeks to investigate the use of ICT in the prevention of drug abuse among undergraduate student of Igbinedion University, Okada, Nigeria.

11.2 Statement of problem

Students take drugs to boost their self-confidence in a bid to approach their female counterparts for amorous relationship, some students take drugs when they are under stress or feel frustrated. Such ugly situations may arise from the death of a loved one, a quarrel between the student and his/her parents leading to the teenager fleeing from home, or maltreatment by a stepmother. Some University students find it difficult to combine their academic programme with other social activities. Consequently, many of them resort to the use of drugs either to study late into the night or relieve tension. The use of drugs is particularly common during examinations. Some University students take drugs because of curiosity and desire for adventure and because of these drugs give a feeling of excitement, such students find it difficult to do without them

Drug abuse is a major public health problem. Nigerian schools, for instance, are characterized with drug abuse among students, giving rise to diverse anti-social ills such as rape, mass failure in examinations, indiscriminate sexual acts, unintended pregnancies, low self-concept, truancy, lying and stealing and many other vices that may interfere with teaching/learning and peaceful atmosphere in the school settings. Students who abuse drugs are seen as threats to the peace and security of their institutions. Apart from the effects of drug abuse on academic work, it is also associated with problems which are evident in social, psychological, health and economic levels of functioning of individuals and the society at large. Majority of drug abuser have no respect for constituted authorities and criminal behaviours are often associated with drug abuse. Condemnable activities such as armed robbery and kidnapping are perpetuated mostly when people are under the influence of drug abuse. Psychologically, the effects of most drugs abused include symptoms of stress, anxiety, depression, behaviour changes, fatigue and loss or increase in appetite.

To address these problems, various measures and programmes by government and non-governmental agencies have made several efforts towards curbing the menace of drug abuse (cigarette and hard drugs) of which the youth are the most gullible victims. The government has for some years been conducting drug abuse education in schools on ad-hoc basis to increase awareness and to monitor its benefits through its Curriculum Research and Development Division. Out of school youth is often educated through mass media and public lectures organised by non-governmental organisations. The media have made positive attempts by contributing to public education on drug abuse, its social and political repercussions by exposing some drug traffickers dead through using their bodies as ‘human cargoes’ in the trade and its resultant effects. Drug awareness days have been organized yearly in the country. Individuals and groups have also taken initiatives to give ad-hoc education to members of the public and to press for legislative steps to be taken.

Having observed that, there is a saying that ICT can also be use as media in the prevention of drug abuse among students. In view of that, the following questions may be raised “is it possible to use ICT in prevention of drug abuse?” With the issue raised above, there is the need to investigate the use of ICT in the prevention of drug abuse and deviant behaviour among undergraduate students of Igbinedion University, Okada, Nigeria with a view to reducing the risk factors associated with drug use behaviour

11.3 Objectives of the Study

The following objectives guided the research:

1. To identify the campaign strategy to prevent drug abuse among undergraduate students in Igbinedion University, Okada
2. To identify associated facilities that could be used to prevent drug abuse among undergraduate students in Igbinedion University, Okada
3. To proffer strategies to overcome the problems associated with the use of the facilities in the prevention of drug abuse among undergraduate students in Igbinedion University, Okada.

11.4 Research Questions

The research provide answers to the following research questions

1. What are the identify campaign strategy to prevent drug abuse among undergraduate students in Igbinedion University, Okada
2. What are the problems associated with the facilities that could be used to prevent drug abuse among undergraduate students in Igbinedion University, Okada?
3. What are the strategies used to proffer solution to the problems associated with the use of the facilities in the prevention of drug abuse among undergraduate students in Igbinedion University, Okada.

11.5 Literature Review

Drug abuse can be defined as excessive drug use inconsistent with medical practice, leading to physical or psychological dependence, mental confusion and other sign of abnormal behaviours.

Drug abuse is a major public health problem all over the world. The use and abuse of drug abuse by adolescents have become one of the parts most disturbing health related phenomena in Nigeria and other parts of the world (NDLEA; 1997). Several student experience mental health programme, either temporarily or for a long period of time, some become insane, maladjusted to school situations and eventually drop out of university. According to Fawa (2013) drug is defined as any substance, which is used for treatment of prevention of a disease in man and animals, drug alters the body functions either positively or otherwise depending on the body composition of the user, the type of drug used, the amount used and whether used singly or with other drugs at the same time.

NAFDAC (2000) as cited by Haladu (2013) explained the term drug abuse as excessive and persistent, Self-administration of a drug without regard to the medically or culturally accepted patterns. It could also be viewed as the use of drug to the extent that it interferes with the health and social function of an individual. World book encyclopaedia (2004) defined drug abuse as the non-medical use of a drug that interferes with a healthy and productive life. Manbe (2014) defined drug abuse as the excessive, maladaptive or addictive or use of drugs for non-medical purpose. Abdullahi (2019) viewed drug abuse as the use of drugs that interferes with the health and social function of an individual. In essence, drug abuse may be defined as the arbitrary over dependence or miss-use of one particular drug with or without a prior medical diagnosis from qualified medical practitioner. It is therefore very important to device way to prevent drug abuse.

11.6 The Concept of Information and Communication Technology

Information and Communication Technology (ICT) is sometime referred to as Information Technology (I.T) in some literatures. It's an omnibus terms that combines computers and telecommunications technology. According to Aina (2014) I.C.T is concerned with the technology is used in acquiring, processing, storing and disseminating information.

The convergence of computers and telecommunication in handling and processing information constitute what is now known as information and communication technology. According to Madu, (2014) it comprises all the electronic infrastructures and facilities employed by libraries to improve and provide efficient sources such facilities in broad terms consist of hardware, software and communication links between the source outlets of the some library and similar outlets of different libraries to facilitate the sharing of common resources for example libraries networks.

I.C.T can be defined as the coming together of computing and telecommunications for the purpose of acquisition, processing, storage transmitting and dissemination of information pectorals means for the management of information. Rana,(2019) observed that I.C.T hold the key to modernizing information access and services, it covers a range of facilities in library which include computers, internet, television, radio, mobile phone etc.

In this age of globalization, the importance of information and communication technology (I.C.T) to people generally and student in particular cannot over emphasised. This is true because I.C.Ts facilitate is a quick and easy access to a wide range of information or information resources worldwide. In fact, it is now difficult to imagine a world without information technology. In this digital age, tertiary institutions strive to be up to date in their circulation. The provision of I.C.T is part and parcel of the entire system, to both the student and the institutions. It is one thing to recognize the importance of I.C.Ts and another to know and effectively be used by students and academics. If I.C.T is put to effective use, the essence of acquiring them is to a larger extent justified vice-versa. Chisenga, (2016) observed that I.C.Ts encompass arrange of rapidly enduring technologies and they include telecommunication technologies (telephone, cable, satellite, TV and radio; computers mediated conferencing, video conferencing). As well as digital technologies (computers, information networks such as internet, World Wide Web, internets and extranets) and software applications.

11.7 I.C.T campaign facilities used in the prevention of drug abuse

Information and communication technology, according to Abdulsalami (2014) I.C.T facilities infrastructure is an umbrella term that include any processing and communication devices such as computer systems, internet, fax, electronic copier, telephone, e-mail, satellite, telex, projector etc.

Computer system: a computer can simply be described as a storage program (institution) can accept data as (input) in a prescribe form, store the data apply a series of arithmetic and logical operation on the data (processing) and produce the result of the operation as an (output) information in a specified format at a very fast speed. G-Mail: is a message distributed by electronic means from one computer user to another or more recipients via a network. These enable users to send electronic mail analogue in the world, either to organization, higher institution or companies that are fully computerized and want to make extensive use of E-mail because it is fast, flexible and reliable. Internet: is a global computer network providing a variety of information and communication facilities, consisting of interconnected networks using standardized communication protocols. Internet is today one of the most important part of our daily life. There are large numbers of things that can be done using the internet and so it is very important. Internet is use for different purpose such as education, financial transaction, research, communication etc.

Fax: is an exact copy of a document made by electronic, scanning and transmitted as data by telecommunication links. And is used to send document to another fax median through the standard telephone line. It does this by first scanning the document using photosensitive devices, it digitizes the images that can be transmitted like normal data through the telephone work. When received in another machine, it decodes the message and prints it out. Electronic Copier: A photocopier (also known as copier or copy machines are machines that makes a paper copies or documents and other visual images quickly and deeply photocopying is widely used in education, business and government. Telephones: is a system for transmitting voice over a distance using wire or radio, by converting constricts vibrations to electrical signals. It also permits two or more users to conduct a conversation.

Telex: is an international system of telegraphy with printed messages transmitted and received by tele-printer using the public telecommunication network. Is also an international message transfer service that consists of tele-printers networks that are connected by a system of switched exchange, communication started by entering the given call number of the contacted subscriber.

11.8 ICT role in the prevention of drug abuse

The information and communication technology played a vital role in prevention of drug abuse among undergraduate students in IUO. The basic understanding of information and communication; (I.C.T) relates to the acquisition, storage and dissemination of information; computer system and telecommunication system are the two thing that come together to enable student to communicate effectively with their colleagues and enable student to source for information from different database (shay 2015) in other word,

I.C.T has being a fast medium of communication used by IUO students. Most of the time, I.C.T facilities are used in creating awareness through various channels like social networks, radio, television, internet etc. these media are the fastest way of transmitting information. Hence, Ray and Day (2014) are of the option that the attitude of co- consistency in drug administration is what leads to drug abuse among youth. In other word taking of drugs without a proper prescription from a qualified doctor, or satisfied by (NAFDAC) approve and the level of literacy in drug administration is teamed as drug abuse. Without going through these stages, there is tendency of excess intake of the drug noticeable among student in most university, hence the need for government to provide drug law enforcement agency in every tertiary institution to challenge the attitude of students' self-medication.

11.9 Problem associated with the use of I.C.T in prevention of drug abuse by undergraduate students

There are numerous problem facing organizations, institutions, societies and health sector in adoption of information and communication technologies in Nigeria. For instance Dwarfs (2019) mentioned erratic power supply, which deters the preventive group from getting access to required information about delinquent individuals through I.C.T facilities. However, effective utilization of I.C.T facilities in disease control and prevention centres may be properly achieved when we considered the fact that, some challenges which appeared to have retarded the easy flow of information and management were still adamant. Ogbomosho (2011) identified challenges associated with the use of I.C.T facilities to include infrastructure related challenges. These according to him, would involve a deliberate effort by policy maker and planners to consider the provision of facilities such as; electrical cable, satellite cable, internet etc., to provide a conducive environment for I.C.T facilities operations in crime prevention, couple with positive attitude of staffs to control the abuse are fundamental for I.C.T system to be successful in any institution (Spacey, Goulding, & Murray, 2013).

Other problem also identifies by Ilaunisi and Osuagwu (2010) included paucity of I.C.T infrastructure, lack of network access, inadequate funding for I.C.T, maintains and absence of funding allocation to technology. In the same view Abisoye (2010) opined that budget allocation such as funds are the major reasons why many Nigerian drug law agencies do not have sophisticated technologies like drug surfer machine. It is important that allocation for I.C.T knowledge training and necessary crime control technology like drug sniffer machines are budgeted, bought and provided to drug law agencies.

11.10 Strategies use to overcome the problem associated with the use of I.C.T in prevention of drug abuse

Martin (2017) opine that I.C.T facilities use in prevention of drug abusers need to be properly manage, if the menace is to curbed, minimize or checkmate. Drug enforcement agencies faces deployment of I.C.T in their operational activities similarly, educational program should be put in place to equip staffs and other personnel involves in crime control with technical skills required to operate I.C.T gadgets. Davies (2012) postulate that the purchase of I.C.T facilities should be considered based on time and purpose, since development in technology is changing. This simply means that technologies becomes obsolete within a few number of years, therefore I.C.T facilities should be careful choosing to accommodate now and long-time use in same vein, organizations that leverage I.C.T facilities to effectively discharge their core responsibilities must adopt technological shift in their policies to remain in their peak over passage of time (Engels, 2018).

However, direct problems like erratic power supply, in conclusive infrastructure, technological know-how of staff, and attitude toward technological acceptance should be effectively checkmated from time to time to constituted authorities of schools, institutions, agencies and organization.

11.11 Methodology

This research adopted a survey research method. A survey research is used to answer question that have been raised to solve problems that have been posed or observed to accesses need and set goals to determine whether or not specific objectives have been met, to establish base line against which future comparisons can be made, to analyze trends across time and generally to describe what amount and in what context. (Isaac and Michael 2017). The Population refers to the entire group of people that is of interest to the researcher or the entire group that meets the criteria the researcher is interested in. A total of 1077 comprises the targeted students' population, (Burn and Grove, 2015). Similarly Nwana (2013) opine that population is all the number of the target group. Therefore the population of the research covers the targeted student of Igbinedion University, Okada. The Sampling Technique is use as a process for specified portion of the population of the area of the research. It gives rooms for saving time, energy and financial cost. Rudolph (2012) defines samples as a proportion of an entity or sub-set however, the essential requirement of any sample is that it must be as representative as possible of the entire population. Nwana (2013) opine that if a population is in many hundreds, one need a sample size of 20%, but if a population is in few thousand, one need a manageable sample size of 108 representing the entire population. The Instruments for Data Collection is the questionnaire, designed base on the objective and research questions. The researcher administered the questionnaire personally to avoid mistake and minimize wastage. The data collected was analyze and presented using descriptive statistics such as frequency distribution tables and simple percentage.

11.12 Response Rate

A total of one hundred and eight (108) copies of questionnaires were distributed to the respondents, one hundred and seven (107) were duly filled and returned representing (99.07%) percent of the respondents. This is explained the high level of response derived from the data collection.

Table 1: I.C.T. Facilities used as campaign strategies to Prevent Drug Abuse in Igbinedion University, Okada.

Types	Frequency (f)	Percentage (**%**)
Computer	30	28.0%
E-mail	5	4.6%
Internet	58	54.2%
Telephone	11	10.2%
Others specify	3	2.8%
Total	107	99.8%

The table 1: Reveal a lot from the data required internet with 58 (54.2%), computer 30 (28.0%), e-mail 5 (4.6%) and others specify 3(2.8%). This implies that 58(54.2%) of the undergraduate students of Igbinedion University Okada opine that internet is the type of I.C.T facility they know and are most conversant with, while 30 (28.0%) of the student disclosed that they are mostly acquainted with computer as an I.C.T facility. Few of the respondents within 5(4.6%) of the respondents believe in electronic mail as the I.C.T facility they know. Meanwhile, the least of the responses derived 3(2.8%) revealed respondents who disclosed other various types of I.C.T facilities they know.

Table 2: The Problem Associated with the use of I.C.T. strategies in Prevention of Drug Abuse

Option	Frequency (f)	Percentage (%)
Insufficient power supply	25	23.3%
Insufficient network	20	18.6%
Insufficient operating skills	11	10.2%
Insufficient Information Management	41	38.3%
Insufficient fund	8	7.4%
Others specify	2	1.8%
Total	107	99.6%

The table 2 shows that sufficient information management 41 (38.3%) has the highest response rate followed by insufficient power supply 25(23.3%), insufficient network 20 (18.6%), insufficient operating skills 11(10.2%) insufficient fund 8(7.4%) and others 2 (1.8%). This means that, although efficient information would go a long way in reducing the prevention of drug abuse, but the issue of cognitive dissonance (in disparate individual beliefs) and information behaviour might limit the propensity of success in achieving drug abuse prevention. W.H.O (2016), recommended drug, adequate funding, and efficient network skills as another positive alternative.

Table 3: strategies use to overcome the problem associated with the use I.C.T in prevention of drug abuse.

Option	Frequency (f)	Percentage (**%**)
Use of I.C.T facilities	28	26.1%
Strategic Campaign (Lunch)	44	41.1%
Educational programs organisation/Orientation for fresher	4	3.7%
launch campaign to checkmate challenge	30	26.1%
Disciplinary measure for offenders	1	0.9%
Total	107	99.8%

Table 3 shows that educational programs should be organised for staffs and others, That has the highest response rate of 44(41.1%), campaign should be launch to checkmate challenge 30 (26.1%), I.C.T facilities should be properly manage 28(26.1%), skill on the use of I.CT should be acquired by staff through training 4 (3.7%) and maintenance of I.C.T facilities 1 (0.9%). Engles (2018), said I.C.T facilities must adopt technological shift in their policies to remain in their peak over passage of time. This implies that a campaign strategy should be launched rather than resorting to a more amicable process organising educational programs for student and staff, to acquiring skills on how to effectively use I.C.T facilities through training. This thus, shows that respondents are still unaware of the most effective and efficient strategy to be adopted in order to avert the challenging trend of drug abuse.

Findings

The following are the major findings of the research;

1. The finding revealed that Computer, Internet, E- mail, and Telephone are used as campaign strategy in the prevention of drug abuse among student of Igbinedion University, Okada.
2. The study also discovered ICT facilities should be properly manage, maintenance while training on the use of I.C.T essential should cover skills on the use of I.C.T related information.
3. From the investigation sufficient fund should be made available for campaign on the prevention of drug abuse among student of Igbinedion University, Okada.
4. The researcher also discuss some strategies that can be used to overcome the problem, such as educating the staff and student, creating current awareness and campaign programs that will educate students the danger of drug abuse among students and staff of the Igbinedion university, Okada.
5. Bill board, flyers, posters, pamphlet, etc. should be produced for students while compulsory orientation be organised yearly for fresher/new intake.

Conclusions

Based on the findings of the research the following conclusion is drawn. The research revealed that there is a decrease in drug abuse by student of Igbinedion University, Okada, this can be conclude that there is a remarkable progress in the campaign on the use of drug abuse among student of Igbinedion University, Okada. And the use of ICT campaign strategies such as organizing programs, creating awareness, lunching of campaign on the effect of drug abuse among students. Finally the ICT campaign strategies created magnanimity impact in the prevention of drug abuse among student and staff of Igbinedion University, Okada.

Recommendations

1. The University management should endeavour to provide adequate and functional I.C.T facilities for prevention of drug abuse.
2. There is an urgent need for the University management to employ competent resource personnel, who will help the student in accessing the current and relevant information on the effect of drug abuse.
3. The management of Igbinedion University, Okada should continue to reinforce in their campaign strategies to provide good network connectivity (smart campus), sufficient power supply and good equipment to students.
4. The University management should develop new strategies on how to prevent drug abuse among the student and staff of the University.

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CHAPTER TWELVE

A STUDY ON BUSINESS INFORMATION FOR ENTREPRENEURIAL GROWTH IN THE IGBINEDION UNIVERSITY COMMUNITY MARKET.

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Abstract

The research aimed to investigate the use of business information for entrepreneurial development within the Igbinedion University (IUO) community market. The study's objectives included identifying the sources of business information relevant to entrepreneurial growth in the Okada Community markets, assessing the degree to which business information is effectively utilized, exploring the motivations behind the use of business information for entrepreneurial advancement, and determining how business information

facilitates entrepreneurial development. The methodologies employed comprised documentary analysis and observational techniques. The results indicated that a significant number of entrepreneurs in the IUO community market depend on customer interactions and mobile phones as their primary sources of information. Business information is utilized by entrepreneurs to enhance their decision-making processes, while others reported using it for daily operational needs. Participants expressed a high level of satisfaction with the business information available to them, noting its positive impact on their decision-making, business promotion, and profit margins. The study concluded that entrepreneurs in the IUO community market require various types of business information to effectively conduct their business operations. This phenomenon was particularly noted in the sectors of photocopying, provision sales, and the distribution of books and stationery, which constitute their primary entrepreneurial activities. In light of these observations, several recommendations were proposed, including the incorporation of local languages by media organizations to broadcast business-related information. Additionally, the adoption of multimedia strategies, such as the use of photographs, visual displays, and audio-visual materials in local dialects, was suggested. Furthermore, university authorities should consider establishing community telecentres in key locations, particularly within public libraries. It is also essential that all government economic empowerment initiatives, including micro-finance programs, poverty alleviation efforts, and support for small and medium-sized enterprises, be restructured and communicated in local dialects to ensure optimal user satisfaction.
Key words: Information, economic development, Entrepreneurship, Business Information

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12.1 Introduction

An entrepreneur is an individual who manages and organizes a business enterprise, typically demonstrating significant initiative and willingness to take risks. This role encompasses practical creativity. Entrepreneurs are those who aim to create value by establishing or expanding economic activities, identifying and capitalizing on new products, processes, or markets. Entrepreneurial activity refers to the proactive human efforts aimed at generating value through the creation or expansion of economic ventures by exploring innovative products, processes, or markets. The term "entrepreneur" is linked to this entrepreneurial activity. According to Nadim and Richard (2016), who define entrepreneurial activity and provide frameworks for data collection, every entrepreneur operates within small, medium, or large enterprises, whether in rural or urban settings, with the goal of maximizing profits. Consequently, to equip current and prospective business owners in selected impoverished communities, such as Okada, with the necessary entrepreneurial management and information technology skills, it is essential to create opportunities that will enable them to successfully start, own, and operate viable businesses. In the current landscape of intense business competition, entrepreneurs and business owners face mounting pressure to enhance their productivity in order to generate greater value in a shorter timeframe, benefiting not only themselves but also their enterprises. Achieving higher productivity than competitors is essential for delivering superior returns to key stakeholders, including customers, employees, and investors. A significant resource available to entrepreneurs is the potential for increased productivity; however, this potential is frequently underutilized due to a focus on the less critical aspects of the entrepreneurial process, leading to suboptimal value creation characterized by lower turnover and profits compared to the business's potential (Ishaya, 2015). Many entrepreneurs and business owners tend to operate as technicians, concentrating on the day-to-day operations of their businesses rather than on strategic development. They often find themselves repeatedly engaged in operational tasks, neglecting the essential work of visioning, implementing that vision, and collaborating with others to realize it. For instance, a medical doctor who becomes an entrepreneur may spend the majority of their time caring for patients, while a lawyer focuses on legal cases, an accountant manages client accounts, and a caterer bakes cakes. In these scenarios, the time allocated for the strategic aspects of entrepreneurship—working on the business is severely limited, ultimately jeopardizing the future success of the enterprise (Bailey, 2013).

Barauah and Achintya (2012) Opine entrepreneurship as business organization that produces or sells goods and service to gain profit. In an environment for example Okada business produce are mostly goods and services consumed by the people and only few people are employed. The prospect of this, is to makes a profit; this, is the different between incomes and business expenses that encourage people to open and

expand business earnings repay owner to take risks that are covered in investing their money and time. The rising awareness and committal in the development of entrepreneurship, to take up new ventures should without fail consider an integrated approach. The developments of entrepreneurship will optimize the use of the unexploited resources; generate self-employment and a self-sufficient economy. Entrepreneurship plays an important role in the economic growth and development of a nation. The purpose of the activities include: Initiation, promotion and distribution of wealth and service.

An entrepreneur is a critical factor in economic development and an integral part of the socio-economic transformation. It is a risk taking activity and challenging tasks which needs utmost devotion, total commitment and greater sincerity with fullest involvement for his personal growth and personality. The entrepreneurial career is neither a day job nor a bed of roses. Prosperity and success never come easily. It takes time and needs hard work, systematic planning and business acumen to be a successful entrepreneur. When choosing a trade one should be very careful in knowing about business information. Business information helps an entrepreneur in knowing more about himself, his own business potentiality and resource. If the individual can understand or identify business traits, then it helps him choose the right path for which he should look into his own beliefs and values. For an entrepreneur it is of great importance to know about business information on the basis of above mentioned individual consideration. The consideration provides ample scope to face his trade. Lewis and Churchill (2011) emphasized that business information helps in making the right decision in choosing the right path for getting involved for deciding the future course of action. This is nothing but self- identification process. After having property identified his strength, weakness and ability, he can make a decision of his choice. Whether he will take up entrepreneurship as a career or not, If he does then in what area? Choosing an entrepreneurial career is like choosing a life partner. The individual has to be involved in it considering those aspects; individual venturing into business should always be governed by four basic qualitative instincts to serve in the world of uncertainty. The four basic qualitative instincts are; Zeal, Will, Skills and Qualitative (ZWSQ) business information.

12.2 Concept of Information

Information according to (Rouse, 2010) “is data that has been verified to be accurate, timely, and specific and organized for a purpose.” He further stated that information when presented within a context that gives it meaning and relevance, can lead to an increase in understanding and decrease in uncertainty. The value of information lies solely in its ability to affect a behavior, decision or outcome. A piece of information is considered value less if after receiving it remain unchanged. After processing (such a formatting and printing), output data can again be perceived as information. When information is packaged or used for understanding or doing something, it is known as knowledge. Information is seen as anything that adds to our existing knowledge, ideas, skills, and experiences either positively or negatively. It enables us to take decisions or react to situations immediately or later at an appropriate time. (Ishaya, 2015) information can be recorded as signs, or transmitted as signals. Information is any kind of event that affects the state of a dynamic system. Conceptually, information is the message (utterance or expression) being conveyed. This concept has numerous other meanings in different contexts. More over the concept of information is closely to notions of constraint, communication, control, data, form, instruction, knowledge, meaning, mental stimulus, pattern, perception, representation, and especially entropy. Information can be defined as facts provided, or learned about

12.3 Concept of Business Information

Business information is widely used for sales and marketing, competitive intelligence, strategic planning, human resources and many other strategic business functions. Business information is one of the major factors where much of the business industries revenues are advertising-driven; the business information segment remains largely driven by paid content either by via subscription or transaction. The primary sources of business information includes: news, market research, credit and financial information. Company and executives profiles, industry, country and economic analysis. Ononaeke (2010) business information traditionally drove the business entrepreneurial development worldwide today. In addition to the financial markets, the primary business information formats can be divided into the following basic reference sources categories, such as guides, bibliographies, dictionaries, almanacs, encyclopedias, hand books,

yearbooks and internet resources, directories, periodicals and newspapers, loose-leaf services, government information and services, statistics, electronic, business information etc. every entrepreneur, whether starting a new business or reinventing the existing ones, requires the application of business information to capture new ideas and services locally to reap the economic benefits of innovation this is so because entrepreneurs carefully meditate and search the environment to identify opportunities and taking bold step towards actualizing it. A good use of business information is indeed a key to success factor for any business enterprise.

Churchill (2012) remarked that in contemplating your business, you must start with a great idea. Business information exposes untapped market and good product which are indeed essential ingredients in any recipe for success. Developing a business idea through viable, business information is a matter of creating a vision, leveraging your strengths and determining what the market needs. Churchill (2012) enumerates some ways entrepreneurs use business information to achieve marketing objectives such as:

- To achieve operational excellence
- To obtain new products, service and business models
- Acquire customers/supplier intimacy
- Improve decision making
- Learn competitive advantage
- For day to day survival of the business

Appropriate use of business information is responsible for the proper and efficient management of business enterprise. In a community like Okada, entrepreneurs here hardly hand and make decisions with little or no information as invoices, purchase others and other document. These are other sources of business information that are needed to be organized and controlled but are really difficult to maintain because of their educational back ground, nature of the customers and business environment. When generating business ideas begins with the creative process of creating plan from information gather to set goals and visualizes how to achieve them. These are the foundation for successful entrepreneurship development.

12.4 Concept of Entrepreneurship

Iwhiwhu (2011) opines that entrepreneurship entails small scale micro business created and managed by local entrepreneur entails small scale or micro business created and managed by local entrepreneur aimed at improving the living standard of the local populace. It is a process whereby concerted efforts are made in enterprise by individual this is with the sole objective of increasing income, creating employment opportunities and upgrading the conditioning of living in local communities. Local entrepreneurship is a well-developed ability to recognize unexploited market opportunities. Jones and Sakong, (2013) defined entrepreneurship as “a force that mobilizes other resources to meet unmet market demand”, the ability to create and build something from practically nothing”, the process of creating value by pulling together a unique package of resources to exploit opportunity”. Timmons, (2019) Stevenson, et al., (2011) posit entrepreneurship as active both within and outside the organization. Entrepreneurship need not involve anything new from a global or even national perspective, but rather the adoption of new forms of business organizations, new technologies and new enterprise producing goods not previously available at a location. Entrepreneurship is therefore considered to be a prime mover in development and why nations, regions and communities that actively promote enterprise development, demonstrate much higher growth rates and consequently higher levels of development than nation’s, regions and communities whose institutions, politics and culture hinders entrepreneurship. An entrepreneurial economy, weather on the national, regional, or community level, differs significantly from a non- entrepreneurial vigorousness, but also by the social vitally and quality of life which it offers with a consequent attractiveness to people. An entrepreneur is someone who undertakes an enterprise; one who owns and manages a business, one who puts together resources to start a new business venture.

12.5 Concept of Development

The term “development” according to cheery (2012) is used in the following conditions; Economic development, socio-economic development, and economic in the USA (or elsewhere). In each case development generally refers to any progressive change primarily in the economic sphere. If the change is quantitative they talk about economic growth. In the same aspect cherry (2012) typifies that in quantitative change, one can talk about the structural change or changes in content development, or the acquisition of the economic system of the new features. Development always has a direction determined by the purpose or purposes of the system. If the direction is positive, then we will speak of the progress, if it is negative, of regression, or degradation. In order words, the nature of regional development, always involves a certain goal or several goals. Basically, economic development is usually considered in conjunction with the development which is usually referred to as a socio-economic development in most social science literature. This includes aspects such as: Increased production and income changes in the institutional, social and administrative structures of the society.The main purpose of economic development in most countries and other regions is to improve the quality of life. Therefore the process of socio-economic development includes three major components: Increase revenue, improve health and increase level of education. The last two component of the quality of life is not always taken into account when assessing the degree of socio-economic development of developed countries and region, but in recent years in economic science and practice, it is given greater importance hence development in any region is multi-purpose, and multi-criteria process.

12.6 Statement of the Problem

Entrepreneur has great resources at his disposal, that can deliver greater productivity but this is often not maximized by business owner’s. Some of these resources are information on the existing customers, potential customers, products brand and rebranding financial and credit facilities, time but to maintain a few to this effect, Ajibero (2019) remarked that the Nigerian government launched at the three items of government economic and financial policies as well as program targeted at recognizing , reengineering and mobilizing the local populace in order to enhance their economic and financial base to enable them cope and complete effectively at best with the hand ship of their daily lives and consequences upon it. Programmers such as operation feed the Nation (1976). Directorate for Food, Roads and Rural infrastructure (1987). National Orientation Agency (2000), National Directorate and Employment (1985), National Economic Empowerment and Development Strategy (2004), Banking reform programmers (2007), Poverty Alleviation programmed (2002), Small Scale Medium Enterprise (2007), Micro Finance programmers (2007) all focused towards economic empowerment. High level of poverty, folding of small scale business enterprise and lack of initiative to expand business enterprise in most areas of Nigeria have been attributed to the poor use of business information in these areas despite the establishment of all these programmers as revealed by data obtained from the federal government of Nigeria (2011). As a result over 70% of the Nigerians live below one dollar per day. That’s the poverty level of most areas in Nigeria. Edo State, Okada inclusive as indicated by new Nigerian (2011) is 75-80%. It is in view of all these that the researcher wishes to find out whether small scale business information for entrepreneurial development is available and utilized by normal people or not.

12.7 Objective of the Study

The study tends to achieve the following objectives:

1) To identify the sources of business information for entrepreneurial development in Okada Community markets.
2) To observe the extent of how business information is being maximized.
3) To observe the reason for using business information for entrepreneurial development.
4) To ascertain how business information promotes entrepreneurial development.

12.8 Sources of Business Information for Entrepreneurial Development

The role of an entrepreneur is to acquire and identify the need of his customer by making research to meet the needs of the customers’. An entrepreneur commences the development of his business by first and

foremost identifying what the need of potential customers are through a market research or environmental scanning. The aim of the entrepreneur is to satisfy the customers therefore he is desirous to change his product and services to the needs of the customers. He develops new products, modify existing ones where necessary, and eliminate others that can no longer satisfy the needs and wants of the customers. This analysis is done using available business information which provide the entrepreneur high chances of success in his business. Various information sources are required to be able to carry out satisfactory socio-economic activities in such business environs. Ishaya (2015). Sternson (2011) considered the specific tool of entrepreneurship development that can be defined as innovation. Innovation is the act that endows resources with value and with a new capacity to create wealth. Innovation creates a resource when it finds a use for it. Therefore available sources of business information must be identified, organized and efficiently maximized to achieve a desirable satisfaction for the customers' needs. In every community, there are many businesses which have been started and run by people with or without formal education. These individuals have survived and prospered by adequately appropriately using any available sources of business information which is almost certainly a necessary condition for business condition. Oki (2018) identified some of the available resources of business information available to entrepreneurs which includes;

- The customer
- Radio
- Television
- Telephone
- Posters
- Worship centers
- Community meeting centers
- Newspapers/Periodicals
- Public Library services. Etc.

He further observed that Nigeria population is predominantly peasant farmers and fisher men. Libraries in this areas can plan current awareness programs based on farming seasons, pond management, agricultural authorities, market price , etc., as well as general information on health and nutrition, infant care, loans and financial aid. Current awareness services keep the user up to date, helps create new ideas, saves time and money spent on journals, and reduces paper work. The major obstacles inhibiting efficient information services in most Nigerian communities' areas are poor communication infrastructure and widely–dispersed population. Barauah and Actintya (2012) argues that large percentage of entrepreneurs always face the challenge of failing to access information and business support services from facilitating institutions like the government, libraries, banks and NGOs. They also noted that this is a problem that frequently occurs to them. The organization that are involved in entrepreneurship development are mainly based in urban areas and only travel to the rural areas, only when a specific program is being organized. Entrepreneurship therefore has limited access to up-to-date market information and business services from these organizations. Business supported by these organization traditionally focus on providing a business friendly environment, mainly through decreasing bureaucracy and/or through setting up small scale business centers, in order to improve the business environment, integrate services and facilitate business entry. All this is done by setting up "virtual" or "real" one- stop agencies where potential and new entrepreneurs can obtain general information and are redirected to more specific organizations. A variety of approaches have been used by entrepreneurs to study the benefits that public libraries bring to those who patronize them. Daudu (2010) reported that library is one of sources that should provide a balanced information, especially to the local populace who, from bulk to the population in most developing countries. These efforts also have a variety of names: economic imparts, economic benefits, Return on Investment (ROI), tax payer benefit, and so forth. The study techniques have generally involved analysis of surveys of users/non-users of the libraries. Iwhiwhu (2011) pointed out that they are indications that the public library benefits that are derived by the entrepreneurs include:

- Improves overall quality of entrepreneurship development
- Increases local property values
- Attract new business to the community
- Attracts patronage to local business

- Enhanced goal fulfillment
- Nurtures a love of reading
- It is a source of enhancing produce and services awareness
- Helped in educating entrepreneurs on how to manage personal finances or saved money
- Helped to obtain new business techniques
- Helped improve or start up new business
- Helped with a business opportunity through current awareness services
- Assisted entrepreneurs to be more productive and innovative in their job
- Introduced users to new business concept

This review above strongly indicates the importance of public libraries and other agencies that provide sources of business information to entrepreneurs. It is also obvious from the fore going review that there is a remarkable development on the business of these entrepreneurs who regularly patronize those sources. The entrepreneur must decide clearly what he or she wants to achieve to enable him know the areas of his need for information before engaging the information provider in a transaction. As a result of this the entrepreneur receive prudent information that will help him/her deal with risky ideas and opportunities to harness all the profits of risk-taking.

12.9 The Use of Business Information for Entrepreneurial Development

Business from rustic environment can be very different from the metropolitan business environment. However, there are strategies that need to be employed in order to change the business condition very quickly, many rustic entrepreneurs set up their business by just relying on the turn out of their customers and hope that the lower price will yield more scales without promotion and advertisement. Nowadays in a very dynamic and competitive business environment business information is rather important to turn-non customer to a customer. Williams (2013) identified various business information needs of the rustic entrepreneurs which include the following.

- Information about different field of particular trade
- Purpose of being the business
- Responsibilities towards customers and the society
- Marketing of the product (strength and weakness of the product)
- Factors affecting marketing demand
- Cost and model of distribution
- Manufacturing process
- Plant and machinery
- Availability of new materials
- Production cost
- Man power
- Fund requirement of working capital
- Assessment of profitability and repayment of term loan.

Ajibero (2019) opine that, it's one thing to monitor the environment with a view to identify needs to be satisfied with a product or service; it is another thing to have the business idea to do it. He observed that feasibility studies for choosing a business location is one important aspect of business information required by entrepreneur. This is because it entails gathering facts and figure about a particular business idea aimed at determining the business profit potentials and the return of the investment. This is necessary depending on the nature and size of the business before committing any money. Alan and Sadoulet (2017) further explained that entrepreneur must possess the ability to see and evaluate business opportunities through feasibility studies, to gather the necessary resources to take advantage of them and initiate appropriate action to ensure success. From this review, it is observed that in order for there to be an entrepreneurial development there must be a willingness to learn from experience and change with the times. It is expected for an entrepreneur to be constantly aware of who he is to increase productivity. One of the main keys to a successful business is a continuous involvement in product and promotion and service growth. A customer's psychological trait has to be studied in order to understand their need and wants and as such products and services is to be tilted towards their satisfaction. This is to say that the entrepreneur keeps a

track record of what good or services are most patronized by the customers and such is improved upon to win the customers loyalty and satisfaction. Haggblade, Hazell and Reardon (2017) assert that now a day's some customers do not play fair, if they like you, they will share information with you. Information that is vital for concluding a deal and the very most important one is usually the price and next the quantity. This situation requires long term relationship with customers so as to obtain from them information from his competitors, Business grow bigger as entrepreneurs go more and more direct with customers. The only way to survive would be to come up with something innovative, provide more value added services or provide more risky services.

Entrepreneurs improve the efficiency of their business operation using pioneer and informative advertisement as a source of information to woo customers. Advertisement is a tool to create new customers and promote goods and services to the potential customers. Jones and Sakong (2013) described advertisement as a business information that described new products and services as well as entire business model. When business serves its customers well, the customers generally respond by returning and purchasing more, this consequently raises profits. Many entrepreneurs are either uneducated or semi-educated and therefore never receive the right information at the right time to make an informed decision. These poor outcome raised cost and loss of customers. Adequate information about customer needs made it possible for entrepreneurs to use real time data obtained from the customers to immediately allocate, repair resources to affected areas and inform customers of repair efforts in order to restore service fast. When entrepreneurs achieve one or more of his business information, it will lead to operational excellence, customer satisfaction, customer/entrepreneur intimacy and improved decision making. There are also chances of achieving a competitive advantage to do things better than your competitors with the right information at hand.

Entrepreneurs should focus on ways to obtain business information because they are necessities of doing business. These necessities are driven by initiatives that would create changes to attract customers through higher services levels. Business information is the foundation for conducting business today. Survival and even existence without extensive use of business information is inconceivable and plays a critical role in increasing profit, although needs for business information has become a more of commodity when coupled with complimentary changes in enterprise and management. It can provide the foundation for new products, services and ways of conducting business that provide enterprise with a strategic advantage. Rouse, (2010) express that for entrepreneurs to develop, they need information on customers purchasing habits by way of negotiation, booking appointments and clinching a deal face and buying advertisement space in the range of local authority publication to gain penitential customers. Telephone can be used to sell the appointments by picking out few good customer within the community as your prospective penitential customers, by given a call to boost your selling confidence. For good sales never fail to turn up for an appointment, don't mention the competition, let the prospect customers do that, never argue with a customer or else you would lose out if you do, never leave a lost scale, always revisit some other time, never take rejection to heart, losing make you appreciate your gains and always keep sales record of the business to experience growth and face similar challenges experienced by large businesses. Expanded sales trigger logistics, transaction accounting and after sales service, growing sales compel the entrepreneurs to study new channels of distribution, feasibility of extending product lines and possible entry into new markets up to date.

12.10 Satisfaction of Business Information by Entrepreneurs

Observers of the economy often refer to the highly entrepreneurial nature of populace that seems to allow almost anyone to start a business and built it into a success. An entrepreneur is that individual who is playing in the business field of uncertainty (Alian, 2017). The early histories of entrepreneurship development in an environment reflect from culture, customs and tradition of the people. The process of entrepreneurship development therefore passed through the penitential roots of the society and all those who accepted entrepreneurial role had the cultural heritage of trade and business. Entrepreneurship involves all the process of creating and managing a business to achieve desirable benefits. Lukpe (2014) revealed that entrepreneur is a pillar of economic development, job creation and social inclusion that serves as a catalyst for regeneration in deprived areas. This pointed out that yet entrepreneurship strategies need to be strengthened. The obstacles that entrepreneurs face when they plan to start or run a business virtually borders on lack of take-off capital, illiteracy, poor access to business information etc. To be effective,

approaches to support entrepreneurs have to be designed with reference to the special situation of the areas in which business are to be setup. The strategies have to be taken into account a number of factors that are typical to that areas pertaining to their particular structural, cultural, human, economic and social situations. Achintya and Com (2016) postulated that many business areas display several competitive disadvantages: poor infrastructure, limited access to capital, greater cost of commodities, transportation difficulties and many more. But business based in a rustic areas in other words have some advantages; untapped local markets with substantial buying power, growth opportunities and a large, diverse and available pool of human capital. Addressing these challenges is vital in order to create an appropriate business climate in rustic areas by examining these factors highlighted one will conclude that adequate financing of entrepreneurs is very important for entrepreneurship development. The barriers pointed out especially lack of verifiable business or market information; limited access to capital, poor infrastructure has to a great extent degenerate entrepreneurship. (Ishaya, 2016)

Dabson (2014) asserted that occupational pursuits opted by entrepreneurship development is tied down to the availability of basic infrastructure, education and access to capital. Tradition governs almost all aspects of living, from the use of economic opportunities and pursuit of occupations, to socialization and the organization of business. Therefore, development policies should be initiated by the individuals/government, to attract all to engage into full investment. Dabson (2014) asserted that occupational pursuits opted by the dwellers received different meaning of value attached to entrepreneurship. Entrepreneurs are considered to venture into business pursuits as society grew and the opportunities for business occupation opened up as well. The value of work tended towards change into the various occupational roles. The emergence of entrepreneurship in Nigeria took effect at the period government launched rural economic empowerment such as small and medium enterprises through various agencies like National Directorate of Employment (NDE), Bank of industries and poverty alleviation programs. The concept of growth seems to be closely related in explaining the trends in entrepreneurship development. Entrepreneurship and small businesses are widely accepted for economic development but well-resourced components of strategies to expand and revitalize local enterprise are required. A central element of these strategies is a wide range of services which include provision of adequate and appropriate business information, marketing advice and training of entrepreneurs and business owners.

The rationale for training according to Lundstrom and Stevenson (2011) is usually one of four imperatives; to make entrepreneurs aware of the wide range of financing and support services that are available to them; to increase the rate of new opportunities, to reduce the failure rate of small businesses and to migrate risks associated with providing debt capital to start-up businesses. There is a prevailing comment in many circles that entrepreneurs and small business require greater incentives, support and encouragement to operate than counterpart in big locations. However there has been a wide spread shift in perspective that suggest that entrepreneurs benefit from significant advantages. From the fore going review, it is discovered that the future of any nation would be gloomier when human capital in entrepreneurs is adequately empowered through entrepreneurship skill development. Entrepreneurship skill development should be a priority need of the nation. This is so because capital investment format of Nigeria as a nation remains faulty format without adequate economic empowerment of the citizenry.

Ashley and Maxwell (2010) pointed out that government and the private sector in Nigeria are playing a greater role in rustic economic development. The role of indigenous entrepreneurship is likely to be much more important in small businesses than in the large scale enterprise in the past. The shift is because many large businesses have not been profitable or economically efficient because of poor state of infrastructures necessary for their running. Consequently, a change of policy that provide greater opportunities for small business to run in all environment is more likely to increase than to reduce the rate of urban influx and growth of crime they contended that rustic entrepreneurship development is action oriented and highly motivated opportunities requiring the gathering of necessary resources to initiate appropriate action that will ensure business success. The entrepreneur on the other hand is empowered to deal with the risk to achieve the goals. It is in support of this that Ayodele and oyeude (2015) recognized that business owners should be aware of the barriers associated with their business prospects. They identified that such barriers could be the reason why entrepreneurs fail. Some of the barriers identified by Ayodele and Oyeude include:

- Lack of proper planning
- Lack of viable business concept

- Lack of market familiarity
- Inadequate start-up or seed capital
- Lack of business know how and sources of business information
- Time pressure and distractions
- Technological infrastructure problems

In addition to the above factors Ronstadt (2013) cited Ayolele and Oyeude he stated that entrepreneurship development has to do with agreement that involve a kind of behavior that includes

1. Initiative taking
2. Organization or reorganization of social economic mechanism to turn resources and situations to practical account
3. The acceptance of the risk of failure

This signifies that entrepreneurship development is a dynamic process of creating incremental wealth by individuals who assume the major risk in terms of equality, time and career commitment of producing values for some product service. The product or service itself may be or not be new or unique but value must somehow be infused by the entrepreneur by securing and allocating the necessary skills and resources. This is obvious in Nigeria in the areas where employees are not satisfied with their jobs either due to poor remuneration packages or job conditions. Due to these situations, an employee that is entrepreneurially inclined and who has the necessary resources ventures into a small scale business in order to improve his/her own standard of living. (Ishaya, 2015).

12.11 Impact of Business Information on Entrepreneurial Development

Society have brought men to live and walk together to achieve common goals. Vaughan (2016) stated that "business information is a kind of information that has been provided to the business community". Various kind of business information is apparent to business operations including publicly funded ones such as public library business information services. To serve the business community well, information professionals the source and the manner of approach that for a business to succeed there is a need for adequate and appropriate communication of business information to the business community. Until today business information has been the most effective source to entrepreneurship development. Ishaya (2015). "Business information is first and foremost in custody for the proper and efficient management of business enterprise". Business information is very important in entrepreneurial development, hence it is focused on different areas of the enterprise, and some examples include: Managing the relationship with customers, management supply, chain production resource management and business intelligence. (Ishaya, 2015) Business information plays a vital role in the survival of any business; this also includes the day to day transaction. This points out that when there is a lack of any vital business information available, the business stands to suffer poor growth and even crumble. It is a strategic factor that creates the right business environment for a business to flourish, expand, in any competitive environment. It reflects on development of public business especially as it relates to promoting the best entrepreneurial environment to start, and expand a business. In support of this statement Banabakova and Panev (2019) sees business information as a logistical service employed by an entrepreneur to create customer relationship management. It is designed to improve the marketing services a greater income. Business information stimulates the effective relationship with customers, which influences the strategy and culture of the enterprise. This means that the management of the main business processes like the advertisement, business publicity, production and supply information, distribution etc. Depends on the accurate and appropriate business information. The effective management of an enterprise and the increase of productivity as well as business promotion all is aspects of business information (Ishaya, 2015). The great Soviet Encyclopedia (2010) defined business information as a message transmitted from a certain persons to other persons by verbal, written or any other means. This definition entails the use of any form of medium as the potential customers. Business information as a message transmitted from a certain person to other persons by verbal, written or any other means. This definition entails the use of any form of medium through which information can be conveyed to the business proprieties as well as the potential customers. Business information is viewed as the most important singular variable, which differentiates and determine whether the enterprise is developing or not. This means that information is a yard stick for rating the business organizations in terms of development. It can liberate an entrepreneur from the shackles of economic darkness and access to it, is a fundamental

right that entrepreneur need. From the literature reviewed one can summarize that business information is facts and opinion provided and received during the course of daily transaction.

Business Information can be obtained directly from people, mass media, libraries and even within the society through observation. Meyer (2015) viewed business information as a resource like other resources should be managed to give a competitive edge. This implies that business information as a resource should be managed in such a way to produce further benefits that will enhance business prosperity. It is in line with this that Abdulsalami (2015) sees business information as one of the important resources needed by entrepreneurial development. A business entrepreneur goes through stages of development, what you focus on today will change and require different approaches to be successful. Abdulsalami (2015) identified attributes of business information as operational excellence, new products, services and models, customer and supplier intimacy, improved decision making, competitive advantage and business survival. The analysis has revealed that business information is different from most other information. (Ishaya, 2015) The very fact that business information is characterized as a dynamic force constantly changing and extending knowledge that corresponds with situations in business development in which outside information is offered to target groups of influence their understanding of certain business potentials can help solve problems to improve the standard of living.

12.12 Summary of the Review

Implementation service can be employed by an entrepreneur to create customer relationship, management. The structure is designed to improve marketing services, customer loyalty and to generate a greater income. Business information is a type of information that has been made available to the business community. They are various kinds of business information services apparent to business operations including publicly funded ones, which include the public library business information services. In order to serve and provide the right information for the community, information professionals need to know the sources and approaches used by the business community to generate and gather information .The process for a business to do well there should be a need for adequate and appropriate communication of business information to the business community. Business environment must be studied and strategies to be employed put in place that will change the businesses by entirely relying on just the turnout of their customers and in return hope that the strategies will yield more sales without hindrances. Nowadays, in an environment that is dynamic and competitive business. Information is rather important to non-customer to a customer. It is based upon such fact that entrepreneurs requires various business information such as information about the purpose being in the business, responsibilities towards customer and society marketing of the product (strength and weaknesses of the product), factors offering availability of new materials, production costs, man power, fund requirement of working capital and assessment of profitability and repayment of term loan. In conclusion there is a great need for the awareness of utilization of business information for entrepreneurship development.

Conclusion

Entrepreneurship in every environment require different types of business information to carry out their business activities. This was specifically observed in the areas of trading, marketing survey, price survey, investment opportunities, photocopying, selling of provision, books and stationeries selling of food stuffs etc. which is their main entrepreneurship. And indeed, these categories of people have low literacy level to read and write. Their literacy levels have relegated many of them in to the use of business information orally. Business information disseminated to the entrepreneurs that could guaranty adequate entrepreneurial development in most part of Nigeria was inadequate. Hence those sources that are supposed to be consulted require the ability to read. Many entrepreneurs found it difficult to understand business information services provided to entrepreneurs using media whose information contents were not broadcasted in local language. This has made the message difficult for most business men and women especially those from rural dwellers to comprehend.

Recommendations

Base on the survey the following recommendations were made.

1. Public libraries and local government information units should make themselves readily accessible by conducting current awareness programs to make business information available to the entrepreneurs especially those from rural areas using local dialects.
2. The level of illiteracy also poses a lot of difficulties in information use and dissemination to entrepreneurs of which Okada community is not an exception. Information delivery centers should repackage business information and endeavor to use multi-media approach like film shows, photographs, pictures, craft displays, audio-visual materials using local dialects to enhance utilization.
3. The authorities of Igbinedion University Okada should establish community Tele-centres in strategic places especially public libraries to enhance adequate utilization of the information sources available for the provision of business information.
4. All government economic empowerment programs such as micro-finance schemes, poverty reduction programs, small and medium-scale enterprises, loan facility grant schemes etc. should be repackaged and disseminated in local dialects to achieve maximum satisfaction by the users.
5. From the survey it was discovered that business information promotes entrepreneurial development positively. Information relating to entrepreneurial development for entrepreneurs should be broadcast at resting times specifically in the evening hours of the day. It is hoped that when this time is chosen, it will attract and encourage the entrepreneurs to keep at breast when entrepreneur programs is going to be presented.

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CHAPTER THIRTEEN

THE SIGNIFICANCE OF SEARCH ENGINES IN ACADEMIC PROGRAMS.

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THE SIGNIFICANCE OF SEARCH ENGINES IN ACADEMIC PROGRAMS.

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13.1 Introduction

Search engines have become an indispensable tool for students in academic programs. In today's digital age, the ability to efficiently locate credible and relevant information online is crucial for academic success. While traditional library resources remain essential, digital search engines especially advanced search tools have revolutionized how students access research materials. These engines help students find scholarly articles, journals, books, and other educational resources, facilitating not only learning but also academic research.

Search engines are specialized software applications designed to assist users in retrieving information from the internet. In contrast, an advanced search engine represents an enhanced or updated version of a traditional search engine, equipped with numerous features aimed at facilitating quicker and more efficient searches. These engines act as intermediaries between the information seeker and web hosts by processing user queries and disseminating them across various websites to compile relevant information. They then present and categorize the results based on their significance and utility to the user. Advanced search engines are intended to deliver information swiftly and with minimal effort, in stark contrast to the time-consuming process of visiting a library to consult physical books or materials. They systematically organize data and present it to users from diverse sources, allowing for seamless navigation between different websites and providing a clearer context for the search terms entered.

In order for undergraduate students at a university to effectively access advanced search engines, it is essential for the university administration to implement a streamlined process that facilitates both access and utilization of these tools. Additionally, staff members must be trained in the methods of accessing and using advanced search engines so that they can impart this knowledge to their students. A search engine is a software system specifically designed to locate information on the World Wide Web. The results are typically displayed in a list format known as search engine results pages (SERPs), which may include a variety of content such as web pages, images, and other file types. Some search engines also extract data from databases or open directories. Unlike web directories, which rely solely on human editors for maintenance, search engines continuously update their information by employing algorithms that operate through web crawlers (Reiger, 2019).

Martzoukou (2019) emphasized the importance of methodological considerations that students should recognize based on their attitudes during the search process, as comprehensive studies on this topic are limited, among other concerns. Search engines have existed since before the World Wide Web was introduced in December 1990. An international survey conducted by OCLC (2015) revealed that 89 percent of information searches performed by university undergraduate students commence with a search engine, with Google being the predominant choice at 68 percent. Furthermore, Bankole and Babalola (2012) identified Google as the most favored search engine among undergraduate students, with a preference rating of 83.3%. This inclination towards Google is attributed to its effectiveness and user-friendly interface. Advanced Search Engine represents a contemporary iteration of search engines, having been developed or enhanced from previous versions. The functionality of every advanced search engine relies on three essential tools:

1. The automatic and continuous discovery of new content.

2. The indexing of content as it is discovered.

3. The ability to search through indexed content to locate specific information that a user seeks.

The integration of these three technological components has proven to be more challenging in practice than one might anticipate. Below are several characteristics of advanced search engines:

a. They operate at a speed that surpasses both auto-complete and instant search functionalities.
b. They utilize schema.org markup to generate enriched search results, such as product ratings based on a five-star system, which are prominently displayed on the search results page.
c. There is a growing emphasis on combating spam content, duplicate material, and websites that excessively utilize advertisements.
d. They possess the capability to handle unit conversions, currency conversions, basic mathematical calculations, term definitions, and language translations, presenting the results directly on the search engine results page (SERP).
e. The Knowledge Graph feature allows for the direct display of encyclopedic information from the public domain within search results. Access and Use of Search Engines by Students is the approach to which search engines are utilized. Search engine use is an embedded task that is determined by individual's specific work contexts and needs.

Marchionini, (2015) defines a task as the manifestation of an information seeker's query that determines the information–seeking action. As Kim (2019) concludes in his study, in order to expand our understanding of users' interactions with search engines, we must expand our knowledge of the search context and associated tasks. This context includes not only finding information but also utilizing the discovered information successfully to accomplish a certain task. Considering the search engine use patterns of specific user groups will facilitate more task–focused assessment and development of search engines.

The advantage of accessing and using advanced search engine cannot be overlooked but due to some factors, most student do not even know the advantage in making use of the advance search engine technology. According to Rosenberg (2015) other factors could be unavailability of internet facilities within the school environment, poor internet coverage, network traffic, financial obstacles or lack of funds, government policies, poor services from network providers and man power.

However, from observations, there is no vital study to show how effective it is to have access and make use of advanced search engines. The use of advanced search engines from previous reports were issues like information seeking behavior, unfamiliarity with ICT facilities (computers and other devices), search engine skills and power supply has been a major concern in most Institutions, also knowing about the various types of search engines is not enough but having the practical knowledge on how to access it and make good use of it and its features. This paper explores the significance of search engines in academic programs, with a particular focus on advanced search engines, their use by students, and the challenges they face

Objectives of the Study

The primary objective of studying the significance of search engines in academic programs is to understand how these tools influence students' access to information, their research capabilities, and overall academic success. Specifically, the study aims to:

1. Identify the Most Preferred Search Engines Used by Students**:** To explore which search engines, including general and advanced tools, are most commonly used by students in academic settings, and understand their features and appeal.
2. Examine the Purpose and Frequency of Search Engine Use**:** To investigate the reasons students use search engines (e.g., literature review, assignments, thesis writing) and how often they rely on these tools in their daily academic routines.
3. Evaluate the Challenges Faced by Students**:** To uncover the common problems students encounter when using search engines, such as information overload, lack of search literacy, or issues with access to full-text materials.
4. Assess the Educational Importance of Advanced Search Engines**:** To analyze the role of advanced search engines (e.g., Google Scholar, Scopus, JSTOR) in enhancing academic research, supporting learning, and improving research outcomes.

5. Propose Solutions to Enhance Search Engine Use in Academic Settings**:** Based on findings, the study seeks to offer recommendations to academic institutions and students for improving the effective use of search engines in academic research and learning.

Statement of the Problems

Despite the increasing reliance on search engines for academic research, several problems persist that hinder students' optimal use of these digital tools. Some of the major issues include:

1. Information Overload**:** One of the most pressing challenges is the overwhelming volume of information available through search engines. Students often struggle to sift through an excessive amount of irrelevant or low-quality information. According to a study by Bawden & Robinson (2020), the sheer abundance of resources in search engine results can lead to confusion and difficulty in identifying the most pertinent and credible materials for academic purposes.
2. Limited Search Literacy**:** Many students are not fully trained in advanced search techniques, such as using Boolean operators, filters, and specialized database features. Rowlands et al. (2022) argue that this lack of search literacy leads to inefficient searches, which may result in missing important academic resources or wasting time on irrelevant results.
3. Access to Scholarly Resources: While advanced search engines offer access to an extensive range of academic resources, many students encounter barriers due to subscription-based databases or paywalls. Jansen et al. (2019) note that access restrictions often prevent students from retrieving full-text articles or scholarly books, limiting the utility of search engines in academic research.
4. Reliability and Quality of Sources**:** While tools like Google Scholar are popular, they can return a mix of high-quality and lower-quality sources. Without proper evaluation skills, students may cite unreliable or non-peer-reviewed materials, compromising the credibility of their work. Hedden (2021) emphasizes the importance of ensuring that students can differentiate between authoritative and questionable sources.
5. Lack of Customization for Specific Academic Needs**:** While general search engines are widely used, specialized databases like PubMed**,** ERIC**,** and Scopus cater to specific disciplines (e.g., medicine, education, and science). Gonzalez et al. (2022) argue that many students fail to take advantage of these specialized search engines, either due to unfamiliarity or lack of guidance from educators.

Significance of Search Engines in Academic Programs

Search engines, particularly advanced search engines, play a significant role in modern academic programs by shaping how students access, interact with, and utilize academic information. The growing importance of search engines in education can be attributed to the following factors:

1. Facilitating Access to Scholarly Content**:** Advanced search engines like Google Scholar, Microsoft Academic**,** and Scopus enable students to easily access peer-reviewed articles, conference papers, journals, and books. This democratization of knowledge has enhanced the quality of research by providing students with direct access to credible academic sources, breaking down geographical and institutional barriers. Wang & Zhang (2022) note that these search engines help bridge gaps in access to information, which is especially important for students in low-resource settings.
2. Enhancing Research Capabilities: Search engines support students in finding relevant and up-to-date information quickly, which is crucial for the timely completion of assignments, dissertations, and research papers. Gonzalez et al. (2022) highlight that specialized features, such as citation tracking and full-text search, allow students to dive deeper into their research topics, find related studies, and build comprehensive literature reviews.
3. Developing Critical Thinking and Information Literacy: The ability to use advanced search techniques such as Boolean operators, keyword variations, and filters for peer-reviewed materials encourages students to think critically about their research process. Kim & Xu (2023) emphasize

that by learning to use these tools effectively, students develop essential skills in research methodology, critical thinking, and information literacy, all of which are integral to academic success and professional competence.

4. Promoting Interdisciplinary Learning**:** Advanced search engines help students engage in interdisciplinary learning by allowing them to access content across diverse fields of study. This fosters a more comprehensive understanding of subjects and promotes academic collaboration. For instance, Google Scholar provides results from a wide array of disciplines, facilitating cross-disciplinary research and encouraging students to explore topics from multiple perspectives.
5. Improving Research Outcomes and Academic Performance: As students use search engines to access high-quality academic resources, the overall quality of their research improves. Jansen et al. (2019) show that students who are proficient in using advanced search engines tend to produce better academic papers, with more relevant citations, accurate data, and stronger theoretical foundations.
6. Supporting Time Management and Efficiency**:** Search engines save time by offering refined search capabilities, reducing the need for physical searches in library catalogs or manual browsing of textbooks. Hedden (2021) argues that students can more efficiently locate resources, focusing more on critical analysis and writing rather than wasting time searching for information.
7. Global Collaboration and Knowledge Sharing**:** Search engines contribute to a global academic community by enabling students to access research from institutions worldwide. This not only supports individual research but also fosters global collaboration, as students can find studies from international researchers and institutions. Gonzalez et al. (2022) underline that this interconnectedness enhances the diversity and inclusiveness of academic research.

Search engines are integral to the academic experience, offering numerous benefits that support learning, research, and academic success. However, their full potential can only be realized if students develop the necessary skills to use these tools effectively. While advanced search engines provide immense value, challenges such as information overload, limited search literacy, and access barriers remain. Addressing these challenges through targeted interventions, such as digital literacy training and improved access to scholarly resources, will ensure that search engines continue to serve as vital academic tools in higher education.

13.2 Literature Review

The growing reliance on the internet for academic purposes has significantly reshaped the way students approach research. According to a study by Jansen et al. (2019)**,** students' academic performance and research quality are increasingly influenced by their ability to navigate search engines effectively. Various studies emphasize the importance of search engines in enhancing students' access to a wide array of scholarly resources. Bawden and Robinson (2020) argue that advanced search engines, which offer specialized filters for scholarly content, allow students to refine their queries, yielding more precise and relevant results compared to basic search engines.

However, several researchers also highlight the difficulties students encounter when using search engines. For example, Rowlands et al. (2022) note that despite the availability of advanced search tools, students often lack the necessary search literacy skills, leading to inefficient searches or the retrieval of irrelevant materials.

A search engine according to Barron's Marketing Dictionary (2012) describes it, as a computer program that has the capability of searching through large volumes of text or other data for specified key words and then retuning a list of files or documents where the key words were found. It also stated that search engines help users track down online information on a wide variety of topics and are valuable online sources of secondary data. In addition, Gale Encyclopedia of Small Business (2012) asserts that search engines are online services that allow users to scan the contents of the internet to find websites or specific information of interest of the users. It explains that when a user inputs a search term, the search engines attempts to match the term to categories or keywords in its catalogues or World Wide Web sites. The search engine

then generates a list of sites that match the search criteria, ranking in order of relevance. Moreover, Kimmon (2012) defines a search engine as a website that connects and organize contents from all over the internet. He explained further that those wishing to locate something would enter a query about what they like to find and the engine provides links to content that matches what they want.

In the light of these definitions, search engines can be described as users assistant to find and retrieve information. Like any other assistant, the degree to which they are able to help depends on the degree to which the users are able to tell them what they want. Therefore, communicating with search engines is a critical part of the search process. The knowledge of how to issued search query is a key factor to getting the needed information from the internet. The Spiders Apprentice (2014) identified and explained the followings as ways by which search queries could be issued in order to find needed information on the internet.

- Key word search
- Refining your search
- Relevance ranking
- Meta tags
- Concepts based searching

There are tips that can help search engine users to have better searches. These tips according to Google (2012) are as follows:

- Keep the search query simple
- Think how the page you are looking for will be written
- Describe what you need with as few terms as possible
- Choose descriptive words

Therefore, to ensure that your searches return the most relevant results, the above mentioned tips should be deployed for searching on the internet.

Search engines are software systems designed to search for information on the World Wide Web. The search results are generally presented in a line of results often referred to as search engine results pages (SERPs). The information may be a mix of web pages, images, and other types of files. Some search engines also mine data available in databases or open directories. Unlike web directories, which are maintained only by human editors, search engines also maintain real-time information by running an algorithm on a web crawler Reiger (2019). Search engine according to Akinola (2010) “is a computer program that acts as a way of retrieving information from a database, based on certain criteria defined by the user”. Modern search engines work by searching databases that contain huge amounts of data. This data is collected from the World Wide Web, newsgroups, and directory projects. The evolution of the search engine was rather quick, with the earliest true search engine appearing at the beginning of the 1990s, and the first modern-style search engine appearing in 1995 Akinola (2010). Search engines are one of the major information retrieval tool that users use to find various kind of Information from the Internet Rangaswamy, (2019).

Britannica Concise Encyclopedia (2012) defines a search engine as a tool for finding information, especially on the internet or World Wide Web. Furthermore, it states that search engines are essentially massive databases that cover wide swaths of the internet. According to Britannica Concise Encyclopedia, search engines mostly consist of the parts at least one program called a spider, or crawler or bot, which craws through the internet gathering information; a database, which stores the gathered information and a search tool, with which users search through the database by typing a keyword describing the information desired.

13.3 Most Preferred Advanced Search Engines Used By Students

Students in academic programs typically rely on both general and specialized search engines. Google Scholar remains one of the most widely used advanced search engines due to its extensive database of peer-reviewed articles, theses, books, and conference papers (Hedden, 2021). Other advanced search

engines such as Microsoft Academic **and** Scopus are also popular for their ability to provide scholarly content and citation tools. Additionally, JSTOR **and** PubMed are preferred in fields like humanities and life sciences, respectively, due to their curated and discipline-specific content.

According to a study by Kim & Xu (2023)**,** Google Scholar is the most used search engine among students, primarily because of its easy accessibility, comprehensive search capabilities, and integration with academic sources. However, databases such as Scopus and Web of Science are still favored in research-intensive fields because of their superior indexing and citation tracking features.

Purpose of Advanced Search Engine Use by Students

The primary purpose of using advanced search engines is to access high-quality, peer-reviewed academic resources that can support research assignments, thesis writing, and other academic activities. Wang & Zhang (2022) indicate that students use advanced search engines to find relevant academic literature, enhance their understanding of subject matter, and cite authoritative sources. Advanced features, such as Boolean operators, phrase search, and filters for peer-reviewed articles, allow students to refine their searches and discover resources that are more directly aligned with their academic needs.

Additionally, students use advanced search engines to keep up with the latest research developments, especially in fields where knowledge evolves rapidly, such as science and technology. Jain et al. (2021) suggest that advanced search engines also help students develop critical research skills, which are essential for postgraduate education and professional work.

There are many search engines and internet directories, but familiarizing yourself with several major ones will be enough to get your online research off to a good start. According to Vakkiari (2013), search strategies are the products of planned or situational interactions between users and IR Systems. In other words, it highlights a working planned interactive reaction for a given situation. Search strategy is the ‘action plan’ for retrieving information.

The main search engines included in this article are: Google, Yahoo, Infoseek, HotBot, AltaVista, Lycos and LookSmart; LookSmart and Yahoo are actually large directories rather than true search engines. Many of the major search engines are also becoming known as "Internet Portals" because they provide a number of popular services for the frequent internet user.

Google

Around 2000, Google's search engine rose to prominence. The company achieved better results for many searches with an innovation called PageRank, as was explained in the paper Anatomy of a Search Engine written by Sergey Brin and Larry Page, the later founders of Google. Google also maintained a minimalist interface to its search engine. In contrast, many of its competitors embedded a search engine in a web portal. Google is a search strategy; using links in a Web text is a reading strategy. A strategy may be adequate or not adequate within the context of a certain task. Google was rated (83.3%) as the most preferred search engines by undergraduate students and the preference towards Google was as a result of its effectiveness as well as the simplicity of its interface.

Yahoo

Yahoo is fast becoming a major media leader. As a search site it functions as a huge directory, which when searched will pull up links to some major and some minor sites related to search. Searching Yahoo can be either useful or invaluable, depending on your subject field. If Yahoo cannot pull up the information you need, the keyword(s) you entered are run on Alta Vista’s search engine. One drawback to searching on Yahoo is it will often bring up insignificant web pages related to your topic. Such as personal homepages or outdated websites in addition to the more serious or commercial website(s) on your topic. By clicking on the options link next to yahoo’s search box you will get to an additional search page where you can limit your search to only the most recent additions to Yahoo as recent as within the last day or week. You can

also browse through the listings in yahoo by category from yahoo's front page. Yahoo also provides searchable news stories culled from various major sources. News comes to yahoo from routers.

Infoseek

Similarly infoseek is also one the preferable advanced search engines commonly use because it is one of the best search engines for finding information in addition to search web, infoseek provides guides to popular subjects which contain links to recommended sites. Each main topic in the guide is broken down further into subtopics, which contain links to more websites. Each topic will bring up a list of popular websites for that topic, which can be useful in getting the searcher to a related site for the subject area quickly.

Hotbot

Hotbot is also an excellent search engine when you are interested in a large number of results and you are searching for a specific subject. It has an excellent search tool, entitled super search that allows you to restrict your web by date, by the domain suffix, by the continent and by the media type such as audio or video.

AltaVista

Alta vista is the most effective when search for recently added or updated pages. You can search for new pages on your subject by simply changing the date on the search box to a recent date. AltaVista can perform a variety of search options like; search only the text found in hyperlink, find pages that contains a particular applet class, search pages on a specific website etc.

Look smart

Look smart reviews a great number of websites and this database of websites reviews is searchable on looksmart. If you are looking for a website on a general subject, you should consider looksmart first. In addition to searching the reviews, you can also click on the main topics which will dig you deeper into the topic and bring up more option. Clicking on these options will allow you to refine your search into more specific categories. Looksmart provides a quick and effective way to find websites. However, if you are searching for a very specific topic, you might start with one of the search engines instead.

13.4 Purpose of Advanced Search Engine Use by Students

The Internet is very useful to university student's especially in Nigeria because it enables them to have access to timely, accurate and relevant information that cannot be obtained from library shelves and for any internet user the best way to access the net is through search so advance search engines makes it more easier. Chen (2018) noted that Internet searching helps university students to boost their intellectual development and job preparation.

Search engines are the foundation of the Internet. Search engines such as Google and Bing are the keys to finding the answers you seek in this huge mass of data. Most students will turn to a search engine as the quickest way of finding the information, or product that they want. Here is some of its importance to undergraduate students:-

Time Saving: A search engine saves time of students in two ways: by eliminating the need to find information manually, and by performing searches at high speeds. Without a search engine, they would have to look at sites one by one and pore over the contents of each carefully. A search site automatically compares your criteria to billions of Web pages and gives you results in a fraction of a second. Students can perform dozens of searches in the course of a few minutes, altering the criteria as they narrow down results.

Relevance: When a search engine scans a website, it scores the content for relevance to particular search words. The reasons why a user might choose one search engine over another are complex but elements such as speed, ergonomics and aesthetics all come into play. Moreover, the most important criterion seems

to be that of the relevance of the results to the search performed, at least in the way they are perceived as relevant by the user. Although search companies keep their ranking formulas secret, they take into consideration factors such as repetition of related words and links from other sites. A search engine sorts its results page by relevance to your criteria, with the score in descending order. You see the highest-scoring results at the top; as you move down the list, websites become less relevant.

Free access: Some search engines, such as LexisNexis, specialize in legal or other specialized, scholarly information; these sites charge a fee to use their services but Google, Bing and Yahoo pay for their operations through advertising; searches are free to the user, without restrictions for the information you seek, the time spent on the site or the number of searches you perform. Although this benefits all users, it is a particular advantage for students.

Comprehensive: Search engines scan the entire Web and keep comprehensive data on every page they catalog. Because search companies hold so much data, they help students find obscure sites about which they would not otherwise know. Search results are more likely to give you too much information rather than too little.

Advanced search: In addition to keywords, students can use advanced search options to refine their results. These options help make their searches more flexible and sophisticated. For example, to exclude results containing a certain word, type a minus sign before the word. To look for an exact phrase, surround it with quotation marks. When you want to search only a specific site or group of sites, type "site:" without quotes followed by the site's web address e.g. to search all college and university sites for nuclear physics, use, "nuclear physics site.edu." Contributing to this, Ojedokun (2011) points out that the Internet has broken down barriers of communication and information access from any part of the World and that it allows users to have access to information and offers them opportunity to access up-to-date research.

13.5 Relevance/Importance of Advanced Search Engines to Students

The relevance of advanced search engines in academic programs cannot be overstated. These tools not only simplify access to scholarly information but also ensure that students are exposed to high-quality, authoritative content, which is crucial for academic integrity and the production of credible research. Bawden & Robinson (2020) argue that advanced search engines help bridge the gap between students and the vast amounts of knowledge available in academic databases.

Furthermore, the capability of advanced search engines to offer content from a wide range of sources—including journals, books, and academic databases enhances the depth and breadth of students' research. Gonzalez et al. (2022) emphasize that search engines like Google Scholar and Scopus contribute to academic development by providing access to not just articles, but also data sets, theses, and gray literature, which are sometimes not accessible through traditional library resources

A review of advance search reveals that the lecturers and the students are the most frequent users of the advanced search engines to search on the Internet. They use the Internet mainly for educational purposes rather than for entertainment. Chen (2018) highlighted that the Internet is used for searching for useful information on a Specific issue as a result of the tremendous, diversity and volume of information contained which is made easier using advanced search engines.

Students not only use the advanced search engines to search for materials to complete their assignment, but also use it to gather resources to supplements curricular offering, Adomi (2013). Attama (2015) says that advance search engines on Internet have really helped students in conducting a good research and easy dissemination of information in the 21st century. Vessy (2015) also noted in her research that 76% of students are accustomed to using the search engines heavily and sometimes preferentially or exclusively for conducting researches and academic assignments. Ajiboye and Tella (2016) noted that the Internet provides cost-free access to valuable and practical foreign and local news, information, and analysis sources in many languages.

13.6 Frequent Use of Advanced Search Engines by Students

Research indicates that students frequently use advanced search engines throughout their academic careers. According to Green et al. (2023)**,** students in higher education institutions use search engines daily or weekly to gather resources for assignments, literature reviews, and research papers. Hedden (2021) further reports that students in fields like engineering and medical sciences, where research is particularly data-heavy, rely heavily on advanced search engines to access cutting-edge publications and datasets.

However, frequent use also raises concerns about information overload. Rowlands et al. (2022) highlight that while students use advanced search engines regularly, they sometimes struggle to sift through the vast amount of data, leading to inefficient use of time and potentially missing key resources.

13.7 Problems Encountered While Using Advanced Search Engines

Despite the many benefits, students face several challenges when using advanced search engines. One of the primary issues is **information overload**. With the sheer volume of information available, students often find it difficult to filter through the results and identify the most relevant sources. Kim & Xu (2023) highlight that even advanced search tools cannot always guarantee the quality of search results, as not all indexed content is necessarily reliable or peer-reviewed.

Another issue is the lack of search literacy skills**.** While advanced search engines offer powerful tools for refining queries, many students lack the knowledge of how to use these tools effectively. Hedden (2021) notes that students often rely on simple keyword searches rather than utilizing advanced operators like Boolean logic, which could help them narrow down results and obtain more accurate outcomes.

Additionally, **access issues** can be a problem. Many students encounter paywalls or subscription-based content, especially in the case of specialized academic databases. Gonzalez et al. (2022) observe that students often struggle with finding full-text versions of articles, limiting the usefulness of advanced search engines.

Rationale

The rationale for studying the significance of advanced search engines in academic programs is clear. Given that digital literacy is now an essential skill for academic success, understanding how students use these tools—and the barriers they face can help educators, library staff, and academic institutions design better training programs. Moreover, as research tools continue to evolve, it is important to assess their impact on academic performance and research outcomes.

Another problem is the problem of accessibility and usability. Search engine usability according to Lee as cited in Ejizu (2010) is the efficient, effective and satisfying completion of a specified task by any given Internet users." Furthermore, another factor that militates against advanced search engine usage according to World Bank Report (2010) is low level of ICT skills development among students. It has been observed that many students are not computer literate and because of that, their search engine usage is limited.

Finally, not all search engine result is reliable or safe. Abdulsalami and Abdulsalami (2014) mentioned the unreliability of information on the Internet. There are not necessarily quality or authenticity checks on information on the Internet. Misrepresented, fake, spam, bugs and pirated literature causes problems for students. Users may have privacy concerns. Other necessity are:

1. Information Accessibility: Search engines enhance accessibility to a plethora of academic resources, including journals, databases, and institutional repositories. This democratizes access to knowledge, empowering students to engage with diverse viewpoints and the latest research.
2. Research Skills Development**:** Proficiency in using search engines is fundamental for effective research. Incorporating search engine training into academic curricula will equip students with essential skills such as keyword optimization, Boolean searching, and evaluating sources for credibility.
3. Interdisciplinary Collaboration: As academic disciplines increasingly intersect, search engines can facilitate cross-disciplinary research. By teaching students to leverage search engines effectively, we can promote collaboration among various fields of study.
4. Time Efficiency: With the overwhelming volume of information available online, search engines save time by providing tailored results. Educating students on how to refine searches will lead to more efficient research practices and improved academic outcomes.
5. Staying Current: The landscape of academic research is constantly evolving. Teaching students how to utilize search engines to find the latest publications and trends ensures they remain informed and competitive in their fields.

Conclusions

Advanced search engines are vital tools for students in academic programs. They enable easy access to a wealth of academic materials, assist in refining research topics, and enhance the quality of student research. However, the benefits come with challenges, such as the overwhelming volume of information, limited search literacy, and issues with access to full-text content. The need for digital literacy training, as well as enhanced search engine capabilities, remains essential for ensuring that students can use these tools effectively.

It can be inferred that advanced search engines play a vital role in supporting undergraduate students, as highlighted in this research. Therefore, it is contended that many students remain unaware of the benefits associated with utilizing advanced search engine technology due to various factors. These factors may include insufficient internet access, inadequate network coverage, a lack of sufficient search skills, information overload, governmental policies or restrictions, high access costs, and computer illiteracy, among others.

In today's information-driven society, the ability to efficiently navigate vast amounts of data is crucial for academic success. Search engines serve as vital tools for students and faculty alike, facilitating access to relevant research, scholarly articles, and educational resources.

By recognizing the significance of search engines in academic programs and implementing targeted strategies to enhance search literacy, we can empower students and faculty to conduct more effective and impactful research. This initiative will not only benefit individual academic pursuits but also contribute to the overall academic excellence of our institution.

Recommendations

1. Digital Literacy Training: Universities and academic institutions should offer comprehensive training on advanced search techniques and how to use search engines effectively. This includes training on Boolean operators, filters, and evaluating the credibility of online sources.
2. Integration of Search Engines into Curriculum**:** Academic programs should incorporate training on search engines into their curricula, helping students to not only find information but to evaluate its quality critically.
3. Improved Access to Resources**:** Efforts should be made to provide students with more open-access resources or institutional subscriptions to help overcome paywalls and access issues.

4. Collaboration with Libraries**:** Collaboration between academic libraries and technology departments can lead to the development of customized search engines and databases that better meet the needs of students.
5. Search Engine Development: Developers of advanced search engines should focus on improving the user interface to make them more intuitive and less overwhelming, as well as provide better filters for content evaluation.
6. Workshops and Training: Implement regular workshops and training sessions focused on advanced search engine techniques. These could be tailored for specific academic programs or general to cover a wide range of disciplines.
7. Resource Guides**:** Develop comprehensive guides that outline best practices for utilizing search engines, including tips on evaluating sources and leveraging academic databases effectively.
8. Collaborative Projects: Encourage faculty to design collaborative research projects that require students to utilize search engines, fostering practical application of skills learned in training sessions.
9. Feedback Mechanism: Establish a system for ongoing feedback from students and faculty on the effectiveness of search engine training and resources, allowing for continuous improvement.

By addressing these challenges, educational institutions can ensure that students leverage advanced search engines effectively, leading to improved academic outcomes.

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CHAPTER FOURTEEN

DELINQUENCY OF INFORMATION RESOURCES IN ACADEMIC LIBRARY: A STUDY OF IGBINEDION UNIVERSITY LIBRARY, OKADA

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Abstract

The study focuses on the instances of client delinquency concerning library resources at Igbinedion University, Okada. It is widely recognized that the advancement of a society is significantly influenced by the timely access to accurate information, with libraries playing a crucial role in this process. Nevertheless, the effectiveness of library services is heavily reliant on the availability of essential information resources. Instances of delinquency regarding these resources have been identified as a significant obstacle to the enhancement of library services in academic institutions. Consequently, this research seeks to identify the underlying causes of delinquency within the Igbinedion University library, Okada, assess the impact of such delinquency, and evaluate the strategies implemented to mitigate these issues. To conduct this study, questionnaires were distributed to students, as well as academic and non-academic staff, and the collected responses were analyzed using tables, frequencies, and percentages. The findings of the study underscore the necessity of educating library users, conducting regular library orientations, and organizing conferences to raise awareness about the importance of books and the detrimental effects of their mutilation on library services. Additionally, the installation of CCTV systems in libraries is recommended as a measure to deter delinquent behavior.

Key Words: Delinquency, Academic Library, Resources, Security, effectiveness of library services

14.1 Introduction

The phenomenon of juvenile delinquency concerning library resources has been examined by numerous scholars. Book theft is recognized as one of the oldest challenges faced by libraries, persisting even in contemporary settings. Abdulsalami (2015) asserts that juvenile delinquency related to library resources remains a persistent concern for librarians, defining theft as the dishonest appropriation of another's property with the intent to permanently deprive the owner of it.

In the framework of this study, juvenile delinquency regarding library resources is analyzed from this viewpoint. It is crucial for librarians to comprehend the legal implications surrounding juvenile delinquency in relation to library resources. Such delinquency is characterized as an anti-social and unlawful act, constituting an offense that may result in legal repercussions for the offender. Ugah (2017) categorizes the theft of library resources as a criminal act that poses a significant barrier to access and utilization of information. He further identifies theft and mutilation of library materials, as well as assaults on staff, as critical issues that warrant immediate attention.

The phenomenon of juvenile delinquency concerning library resources refers to the intentional defacement or destruction of library materials. This includes actions such as the removal of pages from books, articles from periodicals, illustrations, or entire sections from monographs. Such behavior has become a significant, troubling, and regrettable aspect of library operations. Juvenile delinquency manifests in various ways, including underlining and highlighting text in library books, tearing or removing pages, and altering editorial comments found within these books. Additionally, the misuse of library resources is evident in practices such as bending book spines to keep them open at a specific page, using damp fingers to turn pages, marking or shading pages with pencils, pens, or markers, and causing damage to book spines. Abdulsalami (2015) argues that the motivations behind juvenile delinquency in libraries are often rooted in necessity rather than criminal intent. Factors such as dissatisfaction with library services, unfamiliarity with the resources available, ignorance of replacement costs and time, and a lack of consideration for the needs of others can lead library users to engage in the mutilation or damage of materials.

Users require information in various formats, including books, periodicals, maps, compact discs, institutional repositories, CD-ROMs, videos, and the internet. Collectively, these formats are referred to as library resources or information carriers, as they contain valuable information for library patrons. These resources can be classified into several categories:

Print Media: This category encompasses printed materials such as books, pamphlets, and periodicals.

Manuscripts: These consist of handwritten or typewritten documents, including letters and meeting minutes.

Cartographic Materials: This category includes items that depict the Earth's surface or celestial bodies at any scale, such as maps, plans, and globes, which can be two- or three-dimensional.

Graphic Media: These are two-dimensional representations that can be viewed without projection (e.g., photographs, drawings, charts, postcards) or those that can be projected without motion using optical devices (e.g., filmstrips, slides, transparencies).

Audio Recordings: This category refers to materials containing pre-recorded sound vibrations, also known as sound recordings. They serve as the audio equivalent of printed texts and can be stored on various devices, including sound discs, cassettes, tape reels, gramophone records, and compact discs.

Audio Visual Media refers to library resources that deliver information through both auditory and visual means, producing sound alongside images that can be displayed in motion. This category encompasses motion pictures, video recordings, compact discs, and similar formats.

Microforms consist of either transparent or opaque media that contain images in a reduced scale, such as microfilm and microfiche. These materials require specialized equipment known as readers, such as microfiche readers, for viewing.

Digital Media encompasses resources that present information in an electronic format, including computer files, diskettes, and compact discs. These files are typically accessible exclusively through a computer, as noted by Abdulsalami and Abdulsalami (2014).

Books are the most recognized type of library resource. They have been available since the development of printing technology in the middle ages. However, various other library resources complement the print media collection, particularly for educational and leisure activities. Users seek pertinent information regardless of its format, which is why libraries strive to acquire, store, and preserve a diverse array of materials for their patrons.

Igbinedion University Okada is a private University par excellence approved and granted license to operate as a higher educational institution by the government of the Federal Republic of Nigeria. It is a comprehensive educational institution focused on teaching, learning, research and community service. The overall goal is to advance Knowledge, Research and Excellence towards achieving a fulfilled career and destiny. To pursue a scholarly educational and moral training, strategic research for the attainment of a sustainable socio-economic develops for Nigerians and the world. The overall goal is to advance knowledge research and excellence towards achieving a fulfilled career and destiny. The University Library holds variety of information resources on different disciplines ranging from Medicine, Pharmacy, Nursing, Law, Engineering, Business Administration, Banking and Finance, Accounting etc.

14.2 Statement of Problem

The academic library serves as a crucial component and cornerstone of every educational institution. This importance may be compromised if library resources, regardless of their format, are unlawfully removed, damaged, or vandalized due to inadequate security measures. Library resources, including print and non-print materials such as books, maps, newspapers, manuscripts, dictionaries, and almanacs, form the essential foundation for the library's ongoing operation and ensure that knowledge is passed down through generations. The misappropriation of library resources can severely hinder its ability to fulfill its primary purpose, which is to acquire, organize, store, and preserve knowledge, ideas, research, and publications, thereby ensuring that information is readily available and accessible to users in the shortest time possible. Additionally, the theft of resources encompasses various items such as magazines, journals, printed photographs, maps, and a wide array of documents.

A variety of methods are employed in the theft and mutilation of library materials. Instances include the complete removal of textbooks, leaving only the covers behind, or the deliberate tearing out of pages until the entire content is extracted. Occasionally, staff members assigned to monitor the check-in and check-out processes of users do not perform their duties effectively. There are reports of books being thrown out of windows, hidden within clothing, or having critical pages removed. Additionally, some individuals exploit the borrowing system by using due date slips to clandestinely remove books. Users often hope for power outages in the evening, allowing them to exit with books before emergency lighting is activated. This situation, as noted by Idachaba in 1998, has prompted research into the issue of juvenile delinquency within the Igbinedion University Library Okada.

14.3 Objective of the Study

The objectives of this research are outlined as follows:

1. To identify the factors contributing to juvenile delinquency within the Igbinedion University library in Okada.
2. To evaluate the impact of juvenile delinquency on the Igbinedion University library in Okada.
3. To assess the strategies implemented to mitigate instances of juvenile delinquency in the Igbinedion University library in Okada.

14.4 Research Questions

1. What factors contribute to juvenile delinquency in the Igbinedion University library in Okada?
2. What impacts does juvenile delinquency have on the Igbinedion University library in Okada?
3. What strategies are in place to prevent juvenile delinquency in the Igbinedion University library in Okada?

14.5 Delinquency of Information Resources

The issue of library resource delinquency in academic libraries is a prevalent concern that warrants significant attention from librarians and other relevant stakeholders. The act of mutilating library resources is unethical, as it deprives others of the opportunity to access these materials. Such mutilation is often perpetrated by careless and uncultured individuals for their own selfish purposes. This problem tends to escalate towards the end of the semester when students are preparing for examinations. Frequently, mutilated resources become nearly unusable due to the removal of essential chapters or sections. Jama'a indicates that the initial inventory assessment conducted by Bayero University, Kano library was deemed unsuccessful, leading to no subsequent attempts. Consequently, there are no reliable statistical records available to gauge the extent of book theft. Information regarding this issue has been gathered through unions and interviews. For example, the Muslim Student Society at the university raised concerns about the unexplained disappearance of several important books from the library. Additionally, a student attempting to bypass security checks at the circulation desk was apprehended with library materials in their possession. There have also been instances where students colluded with library staff to remove and destroy book cards that document borrowing records.

Jama'a further indicates that certain library personnel engage in theft, particularly of newly acquired resources. Prior to the formal processing of these items, they inscribe their names on the books that pique their interest, thereby indicating personal ownership. These items display only their names and lack the library's stamp, allowing them to circumvent the standard security measures at the circulation desk. Additionally, they exploit borrowing tickets, later returning to remove them and ensure the destruction of the associated book cards. Academic staff at the university have also faced allegations; some have been known to surreptitiously remove materials from the library without obtaining the necessary permissions, resulting in the loss of books loaned to them. On an international scale, Bahr has provided comprehensive statistical data regarding library stock losses from selected school libraries in various developed nations. She notes that "Suffolk County Senior High School reported that approximately 22% of its newly acquired books had vanished from the shelves." It is believed that stock losses in individual public libraries exceed the national

average, with specific examples cited. In a separate study on library resource delinquency, Obikoya (2014) reports that 78.6% of library materials are illicitly removed, often concealed under clothing. Consequently, attire is increasingly viewed as a significant concern regarding library security. Antwi posits that power outages present a prime opportunity for library-related misconduct, as students and other users may take advantage of the darkness to steal or damage library materials.

Bello (2017) indicates that the theft of library information resources through acts of tearing and damage constitutes 66% of library-related crimes in Nigerian universities. He concludes that the security issues surrounding theft and mutilation in academic libraries primarily arise from the tearing of significant portions of library materials. In this context, the act of tearing pages can be classified as a form of mutilation.

In a similar vein, Akinfolarin notes that users exploit small openings that lack barriers to prevent the passage of books, often discarding them outside. Relay highlights the unfortunate involvement of staff as a means through which books are either stolen or damaged. He further observes that library employees, like thieves, are not exempt from the temptation to remove items for sale to legitimate vendors. Likewise, Afolabi (2016) discusses this method, explaining that a dishonest user can utilize the date-due slip of a legally borrowed book to steal other circulating books from the library. The individual simply removes the date-due slip from a book that has been properly checked out and replaces it with that of another book of their choosing. This technique is considered particularly insidious, as it allows for an unlimited number of books to be stolen.

14.6 Causes of delinquency in Igbinedion University Library Okada

Numerous authors have articulated their perspectives on the factors that lead to various types of abuse within library settings. A significant number of researchers attribute the primary causes of library resource abuse to economic downturns and insecurity. Bello (2017), among others, conducted an investigation into juvenile delinquency in academic libraries in Nigeria, which highlighted a notable deficiency in security within university libraries. This lack of security prompted users to engage in delinquent activities, as the demand for library resources exceeded their availability. Consequently, this situation fostered competition for resources, which often led users to resort to theft, mutilation, or unauthorized borrowing. Lorenzen (2016) further notes that “library delinquency manifests in numerous ways, including underlining and highlighting text, tearing or removing pages, and altering content.” Lorenzen identifies several underlying reasons for such mutilation, including students' dissatisfaction or unfamiliarity with library services, ignorance regarding replacement costs and time, a lack of concern for others' needs, and a general perception among students that library mutilation and theft do not constitute criminal behavior. This nefarious activities is as results of;

1. Scarcity of library materials
2. Selfishness on the part of some students
3. Financial constraint
4. High cost of learning materials

Nwalo (2013) emphasized that a significant challenge in library security arises from the fact that the security department of the overarching institution, particularly in academic and special libraries, insists on assigning security staff to the library. These security personnel tend to be more loyal to the security department than to the library administration, complicating the librarian's ability to manage security effectively, as their directives may be disregarded. Furthermore, the security staff assigned to libraries frequently lack the necessary literacy skills to recognize library materials and prevent theft. They are often easily deceived, as library patrons may exploit their naivety. The effectiveness of library security would undoubtedly improve with the appointment of trained library personnel to oversee security functions.

Alafiyato posits that inadequate security may lead patrons to engage in theft. Afolabi (2013) contends that this deficiency in security arises from the absence of modern security systems within libraries. Consequently, it can be inferred that the reliance on manual security measures in academic libraries results in superficial checks of users at the exits and compromises the overall safety of the library facility. Obikoya (2014) indicates that the lack of photocopying services accounts for nearly 70% of the reasons behind the theft or damage of library materials. She attributes this lack to factors such as insufficient resources,

frequent malfunctions, high costs, and inadequate maintenance. Robert further corroborates that some patrons resort to stealing or damaging library resources due to the unavailability of functioning photocopying machines. He recommends that libraries implement affordable and easily accessible photocopying services to mitigate this issue. Ologbosanye observes that library users may resort to theft or vandalism as a form of protest against certain library policies and procedures. Nevertheless, it is essential to adopt specific measures to address or prevent this issue in academic libraries. Timothy emphasizes that the implementation of effective security measures at minimal or no cost is crucial, as it involves library staff at all levels. This primarily entails enhancing surveillance within and around the library to detect and prevent malpractices. The responsibility for safeguarding the library's information resources lies with library personnel, whose qualities, such as patience and creativity, contribute to the success of security initiatives. In summary, to diminish instances of material delinquency, libraries must prioritize security as a fundamental measure, alongside ensuring the availability of photocopying services in the vicinity of the library.

Aguolu (2010) asserts that to mitigate the occurrences of theft and damage to books and journals, it is essential to provide photocopying services at a reasonable cost. Furthermore, it has been recommended that library staff conduct proper orientation for users regarding the risks associated with theft and damage, as this could effectively discourage such behavior among library patrons. Edibo emphasizes that since theft and mutilation have yet to find a definitive solution, library professionals should implement strategies such as user education and awareness regarding the appropriate use of library resources. To facilitate this initiative, Akinfolarin (2014) proposes that librarians or their representatives utilize portions of the time allocated for general studies programs and library orientation sessions to inform students about the detrimental impacts of theft and mutilation on both the library and its users.

14.7 The issue of theft is widespread in various library settings

As guardians of intellectual freedom, librarians must remain alert to the items that are removed and implement strategies to protect library assets. Cuddy and Marchok have noted that a library's ability to effectively serve its patrons is compromised when cataloged books are absent from the shelves, leading to financial losses and inefficiencies for librarians. Martell, who has documented cases of theft and its impact on libraries, recognizes that theft presents a considerable challenge. He proposes several methods to counteract security violations, including theft. Additionally, he advises library administrators to incorporate strategic planning, policies, and procedures with immediate actions to reduce incidents of resource theft and the failure to return library materials. Essentially, Martell promotes a comprehensive security system where both staff and management are dedicated to safeguarding library resources. Some scholars have expressed concerns about the specific types of materials that are often stolen from libraries. These authors emphasize that both print and non-print resources are frequent targets. Moreover, Holt examines the theft of library resources within a community and finds that such occurrences are common, particularly regarding research materials and high-demand items, including special collections, rare books, and manuscripts.

Forley highlights that the collections housed in libraries, which include books, journals, rare volumes, and archives, are under considerable threat from theft and damage. Many of these items are unique and hold substantial monetary and historical value, making them potentially irreplaceable. Furthermore, Holt has examined the issue of staff or insiders misappropriating library assets. Insiders are characterized as individuals within an organization whose positions enable them to hide their unlawful actions. In the library setting, this category encompasses both permanent staff and temporary or contract workers.

14.8 Approaches to Mitigate Delinquent Behavior in Educational Institutions

To bolster the protection of library assets and reduce instances of juvenile delinquency, it is crucial for academic libraries to adopt comprehensive security protocols aimed at safeguarding records and archival materials from both human and environmental threats. Ongoing vigilance by library staff is vital for the preservation of these resources. Aina (2014) underscored the importance of securing library materials, advocating for the implementation of security systems to deter theft and damage. Studies conducted by Abifarin (2017) and Bello (2017) revealed a notable incidence of book theft, mutilation, and misplacement in Nigerian academic libraries. They recommended various strategies to address these challenges,

including enhancing security measures at library entrances and exits, expelling students found guilty of theft or vandalism, providing multiple copies of high-demand texts, reducing photocopying fees, and performing regular inspections of student accommodations and staff areas. Aguolu (2010) asserted that a well-designed building serves as the most effective protection for collections of books and non-book materials. Furthermore, Rajendra proposed that library security considerations should be incorporated into the initial planning stages of library construction, taking into account architectural factors such as site selection and building design.

Nwalo (2013) emphasized that several strategies could be implemented to mitigate the incidence of book theft in libraries, including:

1. Continuous supervision
2. Conducting searches of users at library exits
3. Random inspections of student hostels
4. Assigning trustworthy security personnel to the library
5. Public condemnation of theft through mass media
6. Vigilance against book mutilation by library staff
7. Training security personnel to identify stolen books through comprehensive physical inspections
8. Installing wire mesh on all library windows to prevent books from being thrown out.

McComb (2014) highlighted that video surveillance and closed-circuit television (CCTV) systems serve as effective mechanisms for monitoring security, deterring criminal behavior, and enhancing safety. The author suggests that libraries can adopt CCTV to identify visitors and staff, oversee work areas, prevent theft, and protect the premises and related facilities. Furthermore, this system can be employed to monitor and document instances of misconduct among patrons and employees. In a similar vein, Ramana (2010) observed that the use of Closed Circuit Television (CCTV) in libraries can greatly enhance the management of book theft and the vandalism of pages in books and magazines.

14.9 Methodology

The approach adopted in this research encompasses a variety of techniques and strategies employed by the researchers to examine data relevant to the topic under investigation. For research to be conducted successfully, it is crucial for the researcher to have a thorough understanding of the different methodologies available, as this insight will guide the choice of suitable methods for the research process. The principal method utilized in this study is the survey research method. The population under study comprises 65 individuals, which includes both academic and non-academic staff, as well as students from Legacy University Library in The Gambia. Due to the manageable size of the population, the researchers decided to include all members of the population in the study. A questionnaire was used as the main tool for data collection. The analysis of the gathered data was performed using tables, percentages, and frequency counts.

14.10 Response Rate

In this study, a total of sixty-five (65) questionnaires were distributed to participants. However, due to inadequate monitoring and supervision, only 42 questionnaires were returned, resulting in a response rate of 64.62%. The participants were instructed to select as many options as they found appealing.

Table 1: Causes of Delinquency in Igbinedion University Okada

S/N	Variable	Frequency	Percentage %
	High cost of book	32	15.5
	Lack of photocopying machine	28	13.5
	Insufficient copies in the library	34	16.4
	High demand of books	38	18.4
	Increase in Educational Enrolment	39	18.8

Improper Orientation	36	17.4
Total	207	100

Table 1 presents the opinions of respondents, indicating that 39 individuals (18.8%) believe that the significant increase in student enrollment has resulted in an inadequate supply of reading materials. This concern is closely followed by the high demand for books, noted by 38 respondents (18.4%), which is attributed to the elevated costs of these materials, as expressed by 32 respondents (15.5%). In the context of African universities, particularly at Igbinedion University Okada, there is a noted deficiency in orientation lectures for students. This observation was made by 36 respondents (17.4%) who highlighted the lack of sufficient informational materials available in the library, a sentiment echoed by 34 respondents (16.4%). Additionally, the absence of photocopying machines was reported by 20 respondents (13.5%). In summary, the high cost of books, the lack of photocopying facilities, the insufficient number of copies, and the increased demand for informational materials are identified as contributing factors to the theft of these resources at Igbinedion University Okada by both staff and students.

Table 2: Effect of Delinquency in Igbinedion University Okada

S/N	Variable	Frequency	Percentage %
	Reduction/Lost in value of intellectual materials	31	24.2
	Lead to inadequate information resource in the library	36	28.1
	Discouragement of value in face of clientele	28	21.9
	Inadequate services	33	25.8
	Total	128	100

Table 2 illustrates the impact of the theft and mutilation of informational materials at Igbinedion University Okada. According to 36 respondents (28.1%), these actions have resulted in insufficient information resources within the library to adequately meet the needs of clients. Additionally, 33 respondents (25.8%) indicated that this situation has contributed to a decline in library services. Furthermore, 31 respondents (24.2%) noted a decrease or loss in the value of intellectual materials. This situation has led to a diminished perception of value among clients, as expressed by the respondents. Overall, it is evident that a significant majority of the respondents believe that the theft and mutilation of informational materials will inevitably lead to a loss of intellectual property value, a reduction in available information resources, and a diminished reputation in the eyes of the clientele.

Table 3: Measures Adopted to Prevent to Prevent the Acts of Delinquency in Igbinedion University Okada.

S/N	Variable	Frequency	Percentage %
	Installation of CCTV camera	38	20.5
	Provision of clients safety box at the entrance of library	27	14.6
	Procurement of multiple copies of textbooks	31	16.8
	Installation of electronic security door	23	12.4
	Provision of stand by photocopy machine	37	20
	Vigilant of Library security guards	29	15.7
	Total	185	100

Table 3 indicates that 38 respondents, representing 20.5%, advocate for the installation of CCTV as a strategy to mitigate theft and vandalism at Igbinedion University Okada. Additionally, 31 respondents, or 16.8%, suggest the acquisition of multiple copies of textbooks. Furthermore, 37 respondents, accounting for 20%, recommend the provision of a standby photocopy machine. Meanwhile, 29 respondents, comprising 15.7%, believe that library security personnel should enhance their vigilance. Moreover, 27 respondents, or 14.6%, propose the installation of safety boxes for clients at the library entrance, while 23 respondents, representing 12.4%, support the implementation of electronic security doors. These findings underscore the urgent need for immediate actions to protect library resources from potential threats,

including the prompt installation of CCTV cameras, the establishment of safety boxes for bag storage at the library entrance, and increased vigilance from both security and library staff throughout the premises.

Findings

It has been identified that economic downturns and insecurity contribute significantly to the theft and damage of library resources at Igbinedion University Okada. The deterioration of library materials occurs through various means, including vandalism, exposure to humidity, sunlight, and heat, as well as the concealment of books within exercise books, pockets, and bags, in addition to the tearing of pages.

Such theft and damage result in user dissatisfaction, frustration during the search for resources, and ultimately deter users from utilizing the library.

To mitigate theft and damage, library staff implement a system where bags are deposited in a safety box located at the library entrance.

High Rate of Resource Mismanagement: The study indicates a significant number of unreturned items and poorly maintained collections, which restricts access for users.

Inadequate User Awareness: Many students and faculty members are unaware of the policies regarding the borrowing and return of materials, leading to unintentional delinquency.

Lack of Systematic Monitoring: Current tracking and monitoring systems for library resources are insufficient, resulting in difficulties in identifying delinquent items.

Conclusion

The underlying factors driving the mutilation of library resources include criminal intent, dissatisfaction or unfamiliarity with library services, ignorance regarding replacement costs and time, and a lack of consideration for the needs of others. Therefore, it is imperative to safeguard information materials from theft and vandalism.

Addressing the delinquency of information resources at Igbinedion University Library is crucial for improving access and usability. By implementing these recommendations, we can enhance the overall library experience for students and faculty, ensuring that our resources remain accessible and well-managed.

Way forward

It is advisable that:

1. Several copies of the textbook be provided at Igbinedion University Okada.
2. Enhanced electronic security measures, such as CCTV, electronic doors, and routing and rebooting checks, should be implemented.
3. The library should increase the number of photocopying machines to allow users to make copies of necessary pages for home review.
4. An increase in the number of security personnel is recommended.
5. **Enhanced Awareness Campaigns**:

    - Implement regular awareness programs about library policies, emphasizing the importance of returning materials on time. This can include orientation sessions for new students and faculty.

6. **Improved Tracking System**:
    a. Upgrade the library's management system to include more robust tracking capabilities. Consider implementing automated reminders for due dates via email or SMS to prompt timely returns.
7. **Incentives for Compliance**:

    a. Introduce incentives for students who consistently adhere to borrowing policies, such as rewards or recognition programs. This could encourage a culture of responsibility regarding library resources.
8. **Stricter Penalties**:
    a. Review and possibly revise the existing penalty structure for overdue items. Implementing stricter penalties may deter potential delinquency while ensuring users understand the consequences of non-compliance.
9. **Regular Audits**:
    a. Conduct periodic audits of library collections to identify and rectify issues related to delinquent items. This will help maintain the integrity of the library's resources.
10. **Feedback Mechanism**:
    a. Establish a feedback system that allows users to report issues or suggest improvements regarding the library's resource management. Engaging users can help identify recurring problems and foster a sense of community responsibility.

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CHAPTER FIFTEEN

SALES PROMOTION AND ADVERTISING IN BOOK SELLING

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Astract: Sales promotion and advertising are key elements of the marketing mix that businesses, including book-selling enterprises, use to enhance their visibility and sales. This paper explores the role of these strategies in book-selling, with a particular focus on the challenges faced by bookstores and online book retailers. Through examining current literature and industry practices, it identifies both the potential benefits and significant hurdles in effectively implementing these promotional activities.

In the rapidly changing book-selling industry, the proliferation of digital books, online platforms, and changing consumer behaviors have made it crucial for booksellers to rethink their promotional strategies. The paper further investigates how promotional tools such as discounts, special offers, and advertising mediums can impact consumer choices and sales, while also considering the problems unique to book-selling compared to other retail industries.This research also analyzes consumer behavior, effective strategies, and the impact of digital transformation on marketing practices. The study aims to provide insights into how book retailers and publishers can enhance their promotional efforts to drive sales and build lasting customer relationships

The study concludes by offering insights and recommendations on how bookstores can optimize their sales promotions and advertising to improve consumer engagement, loyalty, and profitability, amidst the competition posed by e-commerce and shifting market trends.

Keywords: Sales Promotion, Advertising, Book-Selling, Digital Transformation, Marketing Practices

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15.1 Introduction

The book-selling industry has undergone significant changes due to technological advancements and shifts in consumer preferences. Sales promotions and advertising are essential tools for engaging readers, driving sales, and differentiating products in a crowded market.

Every product needs to be promoted, that is to say it needs to be drawn to the attention of the market place, and its benefits identified. The principal methods of promotion are: advertising, personal; selling, sales promotion and publicity. It is in these areas that marketing department comes into play Abdulasalami, (2010). They provide the bulk of the expertise, and carry the biggest amount of responsibility, in respect of these aspects of the marking. The aim of an organization's promotional strategy is to bring existing or potential customers from a state of relative unawareness of the organization's products to a state of adopting them. Several different stages of customer behavior have been identified. This research investigates the current landscape of sales promotion and advertising strategies in book selling.These have been described in several different ways as summary bellow:

- Stage 1 Unawareness of the product
- Stage 2 Awareness of the product
- Stage 3 Interest in the product
- Stage 4 Desire for the product
- Stage 5 Conviction about value of the product
- Stage 6 Adoption/Purchase of the product

The four different stages of promotion mentioned above are applied, where appropriate, to each of the stages of customer behavior. Advertising and publicity have the broadcast applications, since they can affect every stage. Personal selling and sales promotion activities, by contrast, tend to be more effective from stage 3 onwards.

Before describing each of the methods in greater detail, one further point can be made about them as a whole. This is that they have a different emphasis according to whether they are being applied to very important in reaching out to consumer market; it is of relatively little significance to industrial markets, where personal selling is the popular method, publicity and sales promotion activities appear4 to rank equally between both types of market.

15.2 Introduction Statement of the Problems of Sales Promotion and Advertising in Book Selling

Sales promotion and advertising in the book-selling industry face several unique challenges, driven by both external market factors and internal constraints. The following problems have been identified:

1. Over-Reliance on Discounts

One of the main problems in the book-selling industry is the over-reliance on discounts as a primary form of sales promotion. While discounts can attract customers and boost short-term sales, they can erode profit margins and create price sensitivity among customers. Over time, customers may become accustomed to waiting for discounts rather than purchasing at regular prices. This leads to "discount fatigue" where promotions lose their effectiveness.

According to research by **Keller (2016)**, excessive discounting in retail, including book-selling, can also damage brand value and consumer perception of the book retailer's quality. This is particularly important in an industry where the perceived value of a book is often associated with its content, its publisher, and the reputation of the seller.

2. Targeting the Right Audience

Sales promotion and advertising efforts in book-selling often face difficulties in identifying and effectively targeting the right customer segments. With the broad range of book genres, interests, and buyer demographics, bookstores struggle to create advertisements and promotions that resonate with specific target audiences. Traditional advertising methods, such as print ads or radio spots, may no longer be as effective in reaching today's tech-savvy, online-oriented consumer.

As **Kotler & Keller (2015)** point out, the increasing fragmentation of media channels and consumer behavior makes it crucial for businesses to adapt their promotional strategies to digital platforms. However, many bookstores still rely heavily on outdated marketing methods and fail to leverage digital advertising tools such as social media marketing, targeted online ads, or email campaigns effectively.

3. Competition from E-Commerce and Digital Books

The rise of online bookstores such as **Amazon** and the growing popularity of e-books present a significant challenge to traditional book retailers. E-commerce platforms have developed highly effective and personalized sales promotion strategies, using data analytics to target individual users with tailored discounts and recommendations. In contrast, brick-and-mortar bookstores often lack the resources to compete on this level, leading to a diminished return on investment for traditional advertising and promotion.

A study by **Hutter et al. (2013)** shows that traditional bookstores often face difficulties in adapting to the digital landscape, which hinders their ability to compete with online retailers that use sophisticated algorithms for targeted promotions. Furthermore, the increasing consumer preference for digital books (e-books) adds another layer of complexity to traditional advertising in the book-selling industry.

4. Budget Constraints and Return on Investment (ROI)

Many book retailers, particularly independent bookstores, operate under tight budget constraints, which limits their ability to execute large-scale or high-impact advertising campaigns. Small budgets may also result in ineffective or poorly targeted advertising efforts, leading to a poor return on investment (ROI). For instance, the high cost of print advertising or the costs associated with physical promotions (such as in-store events) may not yield sufficient sales increases to justify the expense.

According to **Blythe (2018)**, the ROI on sales promotion and advertising activities can be difficult to measure accurately, particularly when the promotions are designed to build brand awareness or customer loyalty rather than immediate sales. This makes it difficult for book retailers to assess the effectiveness of their promotional strategies and may lead to misallocation of marketing funds.

5. Saturation of the Market

With the proliferation of books and publishers, the book market has become saturated, especially with the rise of self-publishing platforms. As a result, booksellers struggle to differentiate their offerings in a crowded marketplace. Sales promotions and advertisements often fail to cut through the noise and reach consumers, leading to a situation where booksellers find it increasingly difficult to drive traffic or sales despite their promotional efforts.

As **Morrison (2015)** argues, saturation in any market forces businesses to shift from price-based promotions to value-based strategies. For book retailers, this means focusing on building stronger customer relationships, providing value-added services such as book recommendations, and improving the in-store experience. However, this requires substantial investment in innovation and customer service, which many smaller bookstores may find difficult to sustain.

6. Shifting Consumer Preferences

In recent years, consumer preferences for books have shifted. The rise of digital content and mobile apps has influenced how people consume books, whether as e-books, audiobooks, or through streaming services. Booksellers face difficulty keeping up with these trends while still focusing on traditional print books. As a result, their advertising efforts can appear outdated or irrelevant to a growing demographic of younger readers who prefer digital formats or consume books on subscription platforms such as Audible or Kindle Unlimited.

Research by **Van der Laan (2020)** highlights how shifting preferences in book consumption have led to significant changes in the kinds of sales promotion and advertising needed for success. For example, younger generations may respond better to influencer marketing or social media-driven promotions than to traditional advertising methods like in-store signage or radio spots.

The problems faced by book retailers in sales promotion and advertising are multi-faceted and evolving, influenced by external market dynamics, technological advancements, and changing consumer behaviors. These challenges require bookstores to rethink their promotional strategies, adopting more targeted, digital-first approaches to stay competitive. By leveraging customer data, refining their messaging, and innovating with promotions that appeal to the preferences of modern readers, book retailers can optimize their marketing efforts to boost sales and brand loyalty.

Advertising

Advertising is the process of communicating persuasive information, about a product to target markets by means of the written and spoken word, and by visual material. By definition the process excludes personal selling. There are five principal media of advertising they are as follows:

- The press-newspapers, magazine journals etc
- Commercial Radio
- Outdoor-hoardings, transport advertisements etc.

Some of the methods of advertising are:

Exhibition: A public show of objects, an international book trade, a display of new discovery for public attention or view etc.
Book Club: Club that offers books cheaply to its members, either old or new arrival.
Book Talk: They are just gift/exchange shop or exhibition or promotion organized by librarian, vendors, publishers etc.
Bulletin: This is a short official notice or news report intended to be made public without delay this could be by organization, company, institution or group of person in book business.

Publisher: A person or firm whose business is to publish books, newspapers etc e.g sometimes to make and sell books etc.
Television: This is an electronic machine that receives broadcast signals and turn into pictures and sound, sales promotion takes place for the view of large audience or customers.
Radio: This is an apparatus for receiving sounds broadcast through the air by means of electrical waves: radios are good instrument of sales promotion to a large audience or targeted person.
Newspapers: Paper containing news, articles, advertising printed and fold either weekly, daily, quarterly, yearly etc.
Newsletter: Small sheet of printed news sets regularly to a particular group of people, or persons, company etc.

Other sources of sales promotion/advertisement are:

1. Conferences
2. Meeting
3. Workshops
4. Seminars
5. Printing Houses
6. Sample Copies
7. Leaflet
8. Gift and Exchange
9. Inter Library Loan
10. Internet
11. Public Catalogue
12. Telephone
13. Telegraph
14. Text Messages
15. Indexes of books
16. Online Vendor
17. Property Services Agency
18. Trade Catalogue
19. Company Information Publications
20. Trade Catalogue
21. House Journals
22. Subscription
23. Book show
24. Sample Copies
25. Manufacturer Catalogue
26. Review Journals
27. Internet Services providers
28. World Wide Web

By far the most important medium, it terms of total expenditure on advertising and sales promotion, is the press. In Britain press news has averaged of about 70% even in recent years. The second most important medium is commercial television, which has consistently maintained a percentage of about 25% of the total.

15.2 Advertising Expenditure

Abdulsalami, (2014) posit that decision about advertising expenditure will usually be made in conjunction with assessments about the position of the product in its life cycle. If the product is at the introductory stage, a considerable amount of resources will be put into advertising. Conversely,, if the product is at the saturation stage, advertising may well be used to score points off the competition.

The sales-task approach to advertising expenditure can be particularly useful in situations where it is possible to state clearly defined objectives for advertising, e.g “to increase awareness of product X in market from present levels to (say) 70%. This approach has the merit of all allocating advertising expenditure to specific targets, but relies heavily on the organization’s ability to define its objectives realistically.

Probably, the most important aspects of any advertising is the decision about what to say to prospective customers, and how to say it. This is message which aims to make people aware of the product and favourably inclined towards it; advertising copy also aims to make people desire the product. The entire process is the fundamental one of turning customer needs into customers wants.

15.3 Aims and Important of Advertisement

Abdulsalami, (2013) expressed the aims and important of Advertisement as follows:

- Increase customer familiarity with a product (a variation of it, e.g. brand, product range etc.)
- Inform customers about specific features of a product
- Inform customers about the key benefits of a product
- Indicate distinctive features and/or benefits of a product (implicitly or explicitly by comparison with competing product).
- Establish the credibility of a product
- Encourage potential customers to buy the product
- Maintain loyalty of existing customers

In setting out to achieve such aims organization needs to abide by a number of la3ws and codes of practice. Most countries exert some degree of state control over the content and form advertising. Issues such as obscenity, blasphemy, racial prejudice and sheer misrepresentation figure should be avoided. The content of an advertisement should not therefore, contain anything offensive to particular groups in society; nor should it contain information or suggestions which are misleading. Most advertisement tend to select one two features of their products for treatment and aim to sell the benefits of these organization's requirement.

Methodology

This research employs a mixed-methods approach, combining quantitative analysis of sales data with qualitative interviews of industry professionals. Surveys were distributed to both consumers and retailers to gather insights on preferences and effectiveness of various promotional strategies.

15. 4 Methods for conveying a message effectively

- The extent of coverage sought to reach customers
- The frequency of exposure to the message
- The effectiveness of the advertisement, i.e. is it making a relevant impact?
- The timing of the advertisement
- The costs involved.

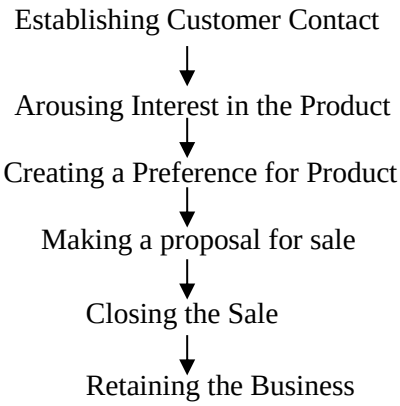
15.5 The Efficacy of Advertising

There are two main ways of looking at the question of advertising effectiveness-the first is to consider the result of the advertising in achieving target improvements in specific tasks, e.g. increasing brand awareness in a specific market; the second is to consider the advertising on sales as a whole, because so many other factors, internal and external are at work in the marketing process of an organization. It is easier to assess the impact of specific advertising campaign on sales in specific product areas.

15.6 Personal Selling (Book)

However, vivid messages put advertising; there is no substitute for the final face-to-face meeting between the buyer and the seller or his representative. Advertising creates the interest and the desire, but personal selling clinches the deal. In industrial markets, as was noted earlier, personal selling plays an even more extensive role. For the moment, let us consider the basic sales process. This is generally understood to encompass five immediate aims, plus a follow-up, as shown below:

Immediate Aims



So far as consumer markets and especially mass markets are concerned advertising must play a vital role in the first three stages of the process, after that personal selling takes over. Personal selling is the most expensive form of promotion. This is reflected in the marketing statistics, which show, for example, that in the United State in 1976 about $100 billion were spent on personal selling compared with $33 billion on advertising. Such personal selling ranges from the mere taking of an order in a shop or a sales office to the creation of new sales in a highly competitive market. Companies which utilize an aggressive sales policy, based on personal selling, are said to be adoption of a push strategy. By comparison firms which rely more heavily on advertising are described as adopting a pull strategy. In order to fulfill these duties a sales representative needs to have relevant information about.

- His or her own organization (customer policies, resources available, organization structure etc.)
- The products on offer (goods, services, ranges etc.)
- Sales and profits targets
- Customers (size, type, location etc.)
- Sales plan for his/her territory
- Promotional materials (brochures, catalogues etc.)
- Techniques of selling (creating interest, dealing with objectives, a sale etc.)

In organizing their sales force, organizations usually have basic options open to them.
- They can organize their representatives on a geographical, or territory basis.
- They can organize on a product basis.
- They can organize on a customer basis.
- The effectiveness of sales representative can be measured in a number of different ways.

Typical evaluation criteria include:
- Net sales (achieved per product, per customer etc.)
- Call rate (number of calls in a given period)
- Value of sales per call
- Number of new sales/new customer (compared with colleagues or with last year's figures).
- Sales expenses in promotion to sales achieved.

15.7 Book Sales Promotion Strategies

Sales promotion activities are form of indirect advertising designed to stimulate sales mainly by the use of incentives. Sales promotion is sometimes called below-the-line advertising in contrast with above-the-line expenditure which is handled by an external advertising agency. Sales promotion activities are organized and funded by the organization's own resources. They can take a number of different forms, e.g.
- Free sample
- Point-of-demonstrations

- Special discount

15.8 Effective sales promotion strategies specifically tailored for the book-selling industry

1. Discounts and Coupons
Discounts and Coupons: Offering price reductions can create urgency and encourage immediate purchases (Thompson, 2022).
Seasonal Sales: Offer discounts during holidays or special events (e.g., back-to-school, summer reading).
Seasonal Promotions: Tying promotions to holidays or literary events can enhance visibility and attract attention (Johnson, 2020).
Loyalty Coupons: Provide loyal customers with exclusive discounts for future purchases.

2. Bundling
Bundling: Combining books with related merchandise or other titles can increase perceived value and average order size (Garcia, 2021).
Series Bundles: Sell complete book series at a discounted price to encourage readers to purchase multiple titles.
Themed Bundles: Create bundles around specific themes (e.g., mystery, romance) or genres, including additional merchandise like bookmarks or tote bags.

3. Limited-Time Offers
Flash Sales: Implement short-term sales (e.g., 24-hour discounts) to create urgency.
Pre-Order Discounts: Encourage pre-orders with a discount, generating early sales and buzz for upcoming releases.

4. Free Trials and Samples
Ebook Samples: Offer the first chapter or a sample of the book for free to entice potential buyers.
Audiobook Previews: Allow potential readers to listen to a snippet of the audiobook version.

5. Contests and Giveaways
Social Media Contests: Engage followers with contests where they can win books or book-related merchandise.
Review Incentives: Encourage readers to leave reviews by entering them into a giveaway for a chance to win a free book.

6. Membership Programs
Subscription Services: Offer a monthly book subscription that includes exclusive titles, early access, or special editions.
Loyalty Programs: Create programs that reward points for every purchase, redeemable for discounts or free books.

7. Event Promotions
Author Signings: Host events where readers can meet authors, often combined with special promotions on their books.
Book Launch Events: Promote new releases with special launch events that include discounts and exclusive merchandise.

8. Cross-Promotions
Collaborate with Local Businesses: Partner with cafes or local stores to offer discounts or host events that benefit both parties.
Bundle with Related Products: Collaborate with other publishers or product brands to offer themed bundles (e.g., book and related merchandise).

9. Email Promotions
Exclusive Offers: Send personalized discounts and promotions to subscribers to incentivize purchases.
Monthly Newsletters: Highlight new releases, sales, and events to keep readers engaged and informed.

10. Social Media Promotions
Flash Promotions: Announce limited-time promotions exclusively on social media to drive engagement and followers.
User-Generated Content: Encourage readers to share their experiences with specific titles using a hashtag, entering them into a contest for a prize.
Utilizing a combination of these sales promotion strategies can help book retailers and publishers effectively engage their audience, drive sales, and enhance customer loyalty. Tailoring promotions to fit the target demographic and leveraging seasonal trends can further amplify their impact.

Advertising Trends
Digital advertising has overtaken traditional methods in reach and effectiveness. Key trends include:

Social Media Marketing: Platforms like Instagram and TikTok are increasingly used to reach younger audiences, leveraging influencer partnerships to drive engagement (Brown, 2023).
Targeted Ads: Utilizing data analytics allows for precise targeting of potential customers, leading to higher conversion rates (Davis, 2021).

References were made earlier to 'push' and 'pull' strategies. Sales promotion falls into two category, promotion directed at consumers and promotion directed at trade consumers. It aims to push sales by offering various incentives at, or associated with, the point-of-sale. Its use is most frequent in the field of consumer products.

The objectives of a promotion directed at consumers could be to:

- Draw attention to new books
- Encourage sale of books that are slow moving
- Stimulate of peak sales of selected books
- Encourage dealers/retailers cooperation in pushing particular books
- Develop good will of dealers/retailers.

The evaluation of sales promotion is never a cut matter, mainly on account of either variable in the overall marketing. The most popular method of evaluation is to measure sales and or market share before, during and after the promotion period.

15.9 Evaluation of the effectiveness of advertising channels in reaching potential customers

Evaluating the effectiveness of advertising channels in reaching potential customers involves several key factors. Here's a breakdown:

1. Audience Targeting
Demographics: Channels like social media (e.g., Facebook, Instagram) allow for precise targeting based on age, gender, and interests.
Behavioral Targeting: Google Ads can target users based on their search behavior, which often results in higher conversion rates.

2. Channel Reach
Social Media: Platforms like Instagram and TikTok have vast user bases, particularly among younger demographics, making them effective for brand awareness.
Email Marketing: Still one of the highest ROI channels, especially for B2B businesses and nurturing leads.

3. Engagement Metrics
Click-Through Rates (CTR): High CTR in digital ads indicates effective messaging and targeting.
Social Media Engagement: Likes, shares, and comments can indicate resonance with the audience.

4. Cost-Effectiveness
Cost Per Acquisition (CPA): Analyzing the CPA across channels helps determine which offers the best return on investment.
Ad Spend vs. Revenue Generated: Compare the costs of advertising to the revenue generated from those campaigns.

5. Conversion Rates
Evaluate how many users take desired actions (purchases, sign-ups) after interacting with ads.
A/B testing different channels can provide insights into what resonates best.

6. Brand Awareness and Recall
Surveys and brand lift studies can measure how well potential customers remember your brand after seeing ads.
Reach and frequency metrics from platforms can help assess exposure levels.

7. Customer Journey Impact
Understand how different channels fit into the customer journey, from awareness to consideration to decision-making.
Multi-channel attribution models can provide insights on how different channels contribute to conversions.

8. Market Trends and Adaptability
Stay updated with market trends; channels like podcasts and influencer marketing are growing in effectiveness but may require adaptation in strategy.

To effectively evaluate advertising channels, businesses should combine quantitative metrics (like CTR and CPA) with qualitative insights (brand awareness and engagement). Regular analysis and adaptation are essential to optimize advertising strategies and ensure maximum reach to potential customers.

Factors influencing book purchasing decisions, including price sensitivity, promotional messaging, and peer recommendations.

15.10 Book purchasing decisions are influenced by several key factors, including:

1. Price Sensitivity
Budget Constraints: Buyers often have specific budgets for books, making price a crucial factor.
Discounts and Promotions: Sales, coupons, or bundled deals can significantly impact purchasing decisions.
Perceived Value: If a book is seen as offering high value (quality content, author reputation), customers may be willing to pay more.

2. Promotional Messaging
Marketing Campaigns: Effective advertising can create excitement and urgency, especially through limited-time offers or exclusive editions.
Cover Design and Blurb: An attractive cover and compelling blurb can capture attention and entice purchases.
Content Marketing: Author interviews, behind-the-scenes content, or book trailers can engage potential readers and influence decisions.

3. Peer Recommendations
Word of Mouth: Recommendations from friends, family, or colleagues can heavily sway buying choices.
Social Proof: Online reviews and ratings on platforms like Goodreads or Amazon can influence perceptions and drive purchases.
Book Clubs and Communities: Participation in book clubs can create a sense of obligation or desire to read specific titles.

4. Author Reputation
Established Authors: Readers may be more inclined to buy books from well-known authors with a proven track record.
Debut Authors: Emerging authors may need strong endorsements or unique marketing strategies to attract attention.

5. Genre and Subject Matter
Personal Interests: Readers often gravitate toward genres they enjoy or find personally relevant. Trends: Popular trends (e.g., dystopian fiction, self-help) can drive interest in specific titles.

6. Availability and Accessibility
Formats: Availability in various formats (eBooks, audiobooks, print) can influence buying decisions. Retail Access: The presence of a book in local stores or availability through online retailers can affect convenience and choice.

7. Timing
Seasonal Trends: Holidays, back-to-school seasons, or special events can boost book sales. Release Timing: New releases from popular authors or timely subjects can lead to increased interest and urgency.

8. Marketing Channels
Social Media: Engagement on platforms like Instagram (Bookstagram) or TikTok (BookTok) can create buzz and influence purchasing decisions.
Email Newsletters: Direct marketing from publishers or authors can effectively reach interested readers.

Understanding these factors can help publishers, authors, and marketers tailor their strategies to effectively reach and influence potential book buyers, ultimately leading to increased sales and customer satisfaction.

Discussion

The findings underscore the importance of adapting promotional strategies to align with consumer behavior and preferences. Digital platforms have transformed how readers discover and purchase books, necessitating a focus on social media and influencer marketing. Additionally, promotional tactics that create urgency and enhance value, such as discounts and bundling, are particularly effective.

Conclusion

Sales promotion and advertising are vital components of the book-selling industry, significantly influencing consumer purchasing behavior. By understanding and leveraging effective strategies, retailers and publishers can enhance their marketing efforts, drive sales, and build long-term customer loyalty. Future research should explore the impact of emerging technologies, such as artificial intelligence and personalized marketing, on book selling.

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CHAPTER SIXTEEN

A STUDY ON THE EFFICACY OF PERSONALIZED LEARNING: ENHANCING UNDERGRADUATE STUDENT PERFORMANCE IN MATHEMATICS THROUGH THE USE OF ARTIFICIAL INTELLIGENCE TUTORING SYSTEMS.

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Abstract

Educational Technologies have changed teaching-learning methodologies, challenging the actors involved in education systems (government, private entities, parents, institution leaders) but especially students and teacher's skills. The study determined the effect of Artificially Intelligent Tutoring System on students' achievement in mathematics in Nasarawa State universities. An Artificially Intelligent Tutoring System was developed and tried on a sample of forty (40) first year undergraduate students. The study was a quasi-experimental design. Data were collected from the students using a Mathematics Achievement Test (MAT). The MAT had reliability score of 0.73 using Kuder-Richardson formula 20. Three research questions and research hypotheses were formulated to guide the study. The research questions were answered using mean and standard deviation while the hypotheses were tested at 5% level of significance using the Analysis of Covariance (ANCOVA). Results from the study revealed that students taught mathematics using the AITS as tutor achieved higher than those taught with the traditional teaching method. The study also revealed that there was no significant difference in the achievement of male and female students who were taught using the AITS. The study finally indicated that the AITS has the potential of catering for both the academically higher and lower learners. The study recommended among others that schools, government and parents should make computer available for the students to engage with both at school and at home. Also, software developers should be encouraged to use the Nigerian Mathematics curriculum in the development of software and equally sort them in different academic level.

Key words: Computer Assisted Instruction (CAI), Artificial Intelligence (AI), Traditional Instruction (TI), Academically Higher Learners, Academically Lower Learners

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16.1 Introduction

Contemporary shifts in educational practice indicate progressive adaptations in how educators prepare students for an evolving new economy. Parents often assert the notion that students are bombarded with requirements to function in a twenty-first century world. For example, outside of the classroom, students are constantly learning new content by engaging with social media, communicating internationally in real-time and acquiring content through technological channels faster than their teachers could possibly deliver within the confines of a traditional classroom period (Thomas, 2018).

Educational institutions are not only interested in the use of technology to effectively train personnel, but they are also exploring new ways they can provide students with self-directed instruction that meets educational goals. Personalized learning is important because it is impelling learning from a traditional teaching practice to a model that can meet every students learning needs (Tolmie, 2016). Personalized learning moves away from teachers being imparters of knowledge, to showing students how to learn, creating the curiosity and thirst for what to do with knowledge (OECD, 2015).

Leadbeater (2006) outlined several types of personalized learning. Shallow personalized learning is where the educator decides the activities and personalizes them for the student, also called 'mass-customization'. Bolstad, Gilbert, McDowall, Bull, Boyd, & Hipkins (2012) add that shallow personalised learning is also called individualisation and is superficial. Bray and McClaskey (2013) agree but add that differentiation is teacher led and part of shallow personalised learning. Deep personalised learning uses authentic real world contexts, is adaptive, easier to implement with devices, involves goal setting, feedback, collaboration where students and teachers organise learning (Bolstad et al., 2012; Grant & Basye, 2014; Leadbeater, 2006). Deep personalization requires students to self-manage or self-regulate and be independent learners. The difference between shallow and deep personalised learning is who has control, the teachers or the students (Tolmie, 2016). Hipkins (2014) explained that personalised learning is collaborative; it isn't teacher directed or student directed, it is both. Personalised learning raises student engagement due to students feeling ownership and pride in their learning (OECD, 2015).

There has been an increasing awareness that interactions between humans and technologies can facilitate effective teaching and learning (Lu, 2018). Computer tutoring is a late development in the long history of tutoring in education. Whereas human tutoring has been used in schools for 2,500 years or for as long as

schools have existed computer tutoring is largely a product of the past half century. The first computer tutoring systems to be used in school classrooms showed the influence of the programmed instruction movement of the time: They presented instruction in short segments or frames, asked questions frequently during instruction, and provided immediate feedback on answers (Kulik & Fletcher, 2017). Grounded in artificial intelligence concepts and cognitive theory, these newer systems guided learners through each step of a problem solution by creating hints and feedback as needed from expert-knowledge databases.

Artificial intelligence refers to applications of software algorithms and techniques that allow computers and machines to simulate human perception and decision making processes to successfully complete tasks. AI has been applied to simpler tasks, such as sending automated phone calls and texts from banks when an unusual transaction appears on someone's account, and more-complex tasks, such as allowing an automobile with advanced driver-assistance systems to automatically stay in its lane and keep a safe distance from the vehicle immediately in front of it (Bass, Dina, & Ellen, 2017).

The systems take in data relevant to the task, typically from sensors in the environment or from a prepopulated database; process the data through the system's statistical algorithms; generate a prediction or decision; and then, in some applications, convert that prediction into a recommendation for the user or an action for a piece of machinery (e.g., an automobile or robot). AI-based applications are currently being used to classify and recognize images on the internet; compose original media content, including music and news articles; and predict the likelihood of outcomes, such as next week's weather, a customer's emotional state, the likelihood that a particular student will graduate from college on time, and the next movie a person might want to rent from Netflix (Murphy, 2019).

The future of higher education is intrinsically linked with developments on new technologies and computing capacities of the new intelligent machines. In this field, advances in artificial intelligence open to new possibilities and challenges for teaching and learning in higher education, with the potential to fundamentally change governance and the internal architecture of institutions of higher education (Popenici & Kerr, 2017). Artificial intelligence (AI) is becoming more attainable in every sector of the economy, and higher education is no exception. AI opens up the possibility for higher education services to become scalable at an unprecedented rate, both inside and outside the classroom. The first-generation computer tutors have been given the retronym CAI tutors (for computer-assisted instruction tutors); the second-generation tutors are usually called intelligent tutoring systems, or ITSs (VanLehn, 2011).

Interactive information and communication technologies are increasingly being integrated in day-to-day life. For example, computers are used to support learners in learning environments to achieve more effective and efficient learning. The rapid development of educational technologies has resulted in effective instructional techniques. Specifically, the use of intelligent tutoring systems (ITS) to enhance online learning environments has allowed such environments to be widely used for instructional purposes (Karaci & Arici, 2014).

ITS is intelligent because it uses the methods and principles of artificial intelligence such as describing the knowledge level, inference mechanism, and machine learning. An ITS provides learners with opportunities for self-directed and individualized learning. Moreover, such systems provide intelligent help and guidance that enables flexibility in terms of time and space (Karaci, Akyuz, Bilgici & Arici, 2018).

Development in science, technology and mathematics is increasingly gaining recognition as one of the most reliable indicators for determining the socio-economic and technological development among nations (Atebe, 2018; Anne and Obinna, 2010 and UNESCO, 2012). For example, Wasagu (2015) reported that, the impact of Science, Technology and Mathematics Education (STME) on the economy of Japan today has made it not only the second largest economy but a threat to even the world's strongest economy, the United States of America (USA) which has remained the most successful in harnessing scientific and technological development for the attainment of its national objectives. In modern society's world over, including Nigeria, there is strong emphasis on the need for the provision of good qualitative Science, Technology and Mathematics Education (Hassan, 2011).

In many contexts, the vision for STEM education is of an interdisciplinary approach, wherein students apply science, technology, engineering and mathematics, as appropriate, to solve real-work problems, thus reflecting the interdisciplinary nature of the work of STEM professionals (Chalmers, Carter, Cooper & Nason, 2017). This type of education may involve any combination of STEM disciplines, or a STEM discipline and another school subject, but the aim is that it is an integrative approach (Sanders, 2018). STEM education is seen as something new and exciting, which promises to engage students because it involves solving real-world challenges such as energy, health and environmental issues (Durik, Hulleman, & Harackiewicz, 2015; Kennedy & Odell, 2014). In contrast, the traditional school curriculum, where different disciplines are taught separately, is seen to lack relevance to students (Wang, Chow, Degol, & Eccles, 2017). Despite the relevance of knowledge of STEM related subjects to the society, achievements of students in science subjects as measured by their scores in senior secondary school certificate examinations have been very poor. Presently, countries in the world are categorized as: developed, developing, and less/under developed. The difference between the developed, developing, and underdeveloped countries however rests on the ability of the developed countries to convert scientific ideas to usable technology while the developing and underdeveloped countries are yet to do so effectively (UNESCO, 2009). Presently, Nigeria remains a developing country with low economic, social, political, cultural, and technological indicators (FME, 2014). In recognition of the impact of STEM development to the overall national development, Federal Government of Nigeria has been supporting it through policies, actions, and programmes yet the decline in academic performance still persist.

Mathematics has all through the years been an important subject both in the role it plays in everyday activities and in its usefulness to other sciences. Mathematics is a body of knowledge centred on concepts such as quantity, structure, space, change and also the academic discipline that studies them (Pierce, 2017) . Mathematics is further defined by Pierce as the science that draws necessary conclusions. Other practitioners of mathematics such as Sowmya (2015), maintains that mathematics is the science of pattern and highly needed in everyday life. According to Agwagah (2018), mathematics is the study of topics such as quantity, structure space and change. Carl Friedrich Gauss known as the “prince of mathematicians” as cited in Wikipedia (2017), also refers to mathematics as “the Queen of the sciences” and the bedrock of other sciences. These definitions emphasize the importance of mathematics.

Mathematics is widely used throughout the world, in human life and many fields including Social Sciences, Natural Sciences, Engineering, Medicine and Education. It is a vital tool in science, commerce and technology. According to Iji (2017), mathematics provides an important key to understanding of the world. In the areas of buying and selling, communication, timing, measurement, moulding, recording among others, the importance is highly acknowledged. Mathematics is one of the core subjects in both junior and senior secondary school and first year undergraduate curricula in Nigeria, which justifies its recognition as being essential in the development of technological advancement in Nigeria. The Nigerian Federal Government made mathematics compulsory and one of the core subjects in both primary and secondary schools because of its usefulness (Federal Republic of Nigeria, 2014). Some of the roles of mathematics according to Nurudeen (2017), include: its ability to enhance the thinking capabilities of individuals by making them to be more creative, reasonable, and rational as well as imaginative. There is no school curriculum or a national development planning which does not take cognizance of the usefulness and development in school mathematics.

The concept of academic performance is inevitable in any formal educational institution. It expresses the learning achievement of an individual or a group at the end of an academic programme. It is a criterion for ascertaining the capabilities of a student from which his potentials could be inferred. Academic performance is generally used to determine how well an individual is able to assimilate, retain, recall and communicate his knowledge of what has been learnt. This concept has close relationship in meaning with academic achievement and academic attainment (Joe, Kpolovie, Osonwa & Iderima, 2014).

Joe et al (2014) defined academic performance as “the demonstrated achievement of learning as opposed to the potential for learning.” It further defines achievement as “knowledge attained or skills developed in school subjects usually designed by test scores or marks assigned by the teacher or both.” These definitions imply that academic performance is the observed and measured aspect of a student’s mastery of skill(s) or subject content(s).

The debate of gender performance in Mathematics and sciences is inconclusive. The term gender is important in STM because it describes the social definition of sex roles rather than distinct biological distinction itself, STM is seen as subject of the male and for the female. Wasagu and Rabi (2017), rationalizes the need to have women in the field of science. Indeed, they said in the ultimate and programmed society of the future, special talent and abilities of the women will be very necessary in order to carry out highly skilled jobs requiring advanced level of education in Mathematics, science and technology. Where women are denied this, they will loose out in the labour market. Furthermore, if developing countries are to continue to advance in the area of science and technology through increase of personnel in science based occupation, women need to be there, contributing their own quota. In addition, the trends towards social, ethical and humanistic values of science demand that more women enter science-based occupation so that they can inject their caring nature into scientific practices. Consequently, they will help to alter the image of science from an impersonal call pursuit to sciences that focuses on men. So far, men seem to have pursuit science for power and conquest. With women in science based occupation, science would be more useful and interesting (Wasagu et al, 2017).

Thus, teaching in Nigeria cannot be completely described without mentioning gender. In Nigeria, teaching is classified as feminine profession. From the National Commission for Colleges of Education (NCCE) Digest of Statistics on Colleges of Education (2009) showed two important trends in female enrolment at the tertiary education level. The study revealed that females are not up to half of the beneficiaries of higher education in any of the three kinds of tertiary institutions and indeed, there is a high proportion of female in colleges of education (a teaching oriented institution) than in either polytechnics or universities. The consequences of these are low participation in high education position and wider gender gap which slows growth for females. This has limited their employment opportunities and access to position of influence and limit their participation in, and their ability to shape Mathematics, science and technology. Similarly, Hassan (2011) reported that, the low proportion of female in the study of science courses and science-based occupations and abandonment of teaching career by women has caused serious concern to science educators-in particular. The role of females cannot be ignored in the current dispensation of attaining improved standards in scientific and technological development. It is for this reason there came a need to include gender as a variable.

16.2 Statement of the Problem

The traditional classroom structure, with all students learning in the same place and at the same pace, is no longer feasible for today's educators (Grant & Basye, 2014). According to researchers and educators with the USDOE (2010), "(Technology) frees learning from a rigid information-transfer model (from book or educator to students)". The use of technology creates opportunities for teachers to release control of learning and experiences to students and produces opportunities for them to choose how, when, and where learning occurs, which reduces barriers (Grant & Basye, 2014).

Also, academic performance, which is measured by the examination results, is one of the major goals of a school. The need to effectively disseminate knowledge and skills timely and in an efficient manner to a numerous group of people as in the case of higher institution of learning is now imperative. Moreso, the need to effectively disseminate knowledge and skills timely and in an efficient manner to a numerous group of people as in the case of higher institution of learning is now imperative.

Imagine a world where grading a full course's papers takes 15 minutes, and teaching assistants, student advisors and enrolment counsellors are available 24 hours a day, seven days a week. This is a world where a student's degree plan can shift instantly based on his or her needs, updated with a clear breakdown of how those shifts will affect costs, and quickly relayed to his or her advisor. Imagine a world where faculty can create immersive, real-world experiences for students without leaving the classroom, map out a class's misconceptions about material down to discrete learning outcomes and select a series of intervention strategies targeted to each student's unique learning needs. Many of these elements have always been possible through extensive human effort, but AI will make this world available at scale, freeing up faculty and staff to deliver a more personal, tailored experience that better meets students' needs and prepares them for success.

The researcher would therefore like to develop an Artificially Intelligent Tutoring System (AITS) and use the software to test the effectiveness of Personalized Learning as regards to raising academic performance of undergraduate students in Mathematics.

Purpose of the Study

The purpose of the study is to design and test the effectiveness of an Artificially Intelligent Tutoring System on the performance of Undergraduate Student in Mathematics. The specific objectives of this study are to:

1. To develop prototypes of the Artificially Intelligent Tutoring System (AITS) modules
2. To determine the effects of AITS on the performance of Undergraduate Student in Mathematics
3. Ascertain whether AITS have any effect on male and female students' performance
4. Determine the interaction effect between gender and AITS
5. To determine whether AITS cater for both academically higher-level learners and lower-level learners

16.3 Research Questions

The following research questions and hypotheses were developed to elicit answers for this study:

1. What are the mean achievement scores of students who were taught with AITS as tutor and those who were taught with the traditional method?
2. What are the mean achievement scores of male and female students who were taught with AITS as tutor?
3. How does AITS cater for both academically higher-level learners and lower-level learners?

16.4 Research Hypotheses

There is no significant difference between the mean achievement scores of students taught with Artificially Intelligent Tutoring System and those taught with traditional teaching method.
There is no significant difference between the mean achievement scores of male and female students' who were taught with AITS

1. There is no significant interaction between gender and AITS
2. There is no significant difference on the effect of AITS on academically higher-level learners and lower-level learners

16.5 Literature Review

Theoretical Framework
Jerome Bruner's Theory of Constructivism
Constructivist theory states that learning is an active process in which learners construct new ideas or concepts based upon their previous knowledge (Bruner, 2016). This theory was propounded in 1966 by Jerome Bruner. The characteristics of Bruner's constructivist theory are;

1. knowledge is not transmitted but constructed through hands-on activities or personal experience which generates knowledge;
2. learning occurs through student-centred activities rather than teacher led activity;
   students must be allowed to exhibit what they have learned in different ways, not just in testing or examination (Roblyer, 2016).

Bruner's theory of constructivism was influenced by the earlier theoretical research of Lev Vygotsky and Jean Piaget (Overbaugh, 2014). His theoretical framework supports the belief that learners construct new ideas or concepts based upon existing knowledge. The process of learning is active and involves transformation of information, deriving meaning from experience, forming hypothesis, and decision making. The AITS is one of the dynamic mathematics software which reinforces students to discover mathematical concepts by doing practice. This assertion is in line with Bruner's submission that children could be active problem solvers and are capable of exploring more difficult subjects of instruction when offered the

opportunity. Bruner believed, from a constructive perspective that “Education is a process of personal discovery” (Clabaugh, 2019).

16.6 Skinner’s Theory of Linear Programming

This study has the theoretical backing of Skinner; a behavouralist, and well known psychologist who extended the work of Edward. L. Thorndike. Skinner was instrumental in popularizing a behavouristic approach to teaching and learning through his research on the effects of reinforcement.

Skinner as cited by Ezeh (2019) had interest in teaching machines and he noted that the teaching machine permits the user to work on his own and also at his pace. B. F Skinner promulgated the idea of teaching machine in 1953, after a visit to his daughter’s fourth grade class where during arithmetic assignment made two observations:

All students had to proceed at the same pace in the teaching situation

Students had to wait 24hours to learn the accuracy of their responses to the problems. A few days later, he built a primitive machine to teach arithmetic (Ezeh, 2019).

Skinner stated the two improvements to the learning process brought about by the teaching machine as follows: immediate reinforcement and individualization. He noted that individualization allows the learner to work on his/ her own and also at his/her own pace. Skinner’s interest was on linear teaching program which requires presentation in small bits, logical sequence and immediate response from the learner. According to Ozofor (2011), linear programming is based on the principles of operant conditioning, one of which states that if the occurrence of an operant is followed by the presentation of a reinforcing stimulus, the strength is increased. At a point, skinner’s Linear programmed learning and teaching machines were challenged by other theories.

16.7 Crowder’s Theory of Branching Programming

Another theory that is in support of computer based learning is the Crowder’s theory of branching programming. Crowder was a behaviourist who extended the work of Skinner. As Skinner believed in linear programmed learning; Crowder believed in branching program. He is of the view that the branching will enable the learner to retrace his steps back through that position of the program which his errors indicate that he did not adequately learn. Crowder’s preference of the branching program was because he believed that the program will take care of different exigencies of each individual. Crowder brought in the idea of personalization. His idea of personalization was that the sequence of progressing is not linear but is determined by the learner’s state of assimilation of the material presented, so that it could be different for each individual. The computer allows this as it allows the user to move at his own pace and also review until a concept is understood.

For obvious problems of the early teaching machines, such as its cumbersomeness, expensiveness and difficulty of repair/maintenance when broken down, these ideas were not in use until the 70s that brought in Time- shared Interactive Computer Controlled Information Television (TICCIT) in 1971 and Programmed Logic for Automatic Teaching Operation (PLATO IV) in 1976 (Landaurer,2015). These two programs stressed the „personalization’ aspects of instruction where individual differences are taken care of.

The 80s equally witnessed another form of instruction called Integration. According to Baker (2017), Integration of instruction means bringing in other media in a single device managed by the central memory of a computer. He further stated that an integrated multimedia system is one in which several different presentational channels are used either simultaneously or in sequence in order to implement a particular instructional strategy. Baker highlighted two forms of integration as: Integration of media and integration of mode. He defined mode of instruction as the function a program can perform in assisting the learner. They include:

1. **Presentation**: Introducing learning materials in a defined pattern
2. **Drill and practice:** Exercising the learner in mastering the skills needed.

3. **Tutorial and Dialogue:** Presenting learning materials in a more flexible and interactive way, using variable questioning approaches;
4. **Inquiry and Browsing:** Providing the learner with a base of stored information through which he can freely navigate
5. **Simulation and Games:** Allowing for experimenting different courses of action and learning from the consequences.
6. **Problem solving:** Offering a framework of rules and data to assist in the process of learning while discovering
7. **Testing and Monitoring:** Keeping a record of the learner's achievements and, on that basis, suggesting personalized learning.

16.8 Conceptual Framework

This section proposes a conceptual framework within which the concepts learning, traditional learning, personalized learning and academic performance is treated in this work.

Concept of Learning

Learning is an active and dynamic process in which individuals make use of a variety of information and strategies modes of processing (Shekari, 2015). Marshal (2010) as cited in (Shekari, 2015) states that learning is imprinting of materials (memorization) of information, skills and abilities. He further explains that human minds are essentially selfish and therefore people act only to increase "pleasure and to avoid pain". This utilitarian theory on conceptualization learning had it that human minds at birth are like clean slate, which is gradually filled up by sensation derived from their environment. Kadiri (2014) opined that learning is a process that an individual acquires as a result of maturation. The maturation theory explains further that the capacity of learning in an individual depends largely on his maturation level.

However, two important variables stand unique in a discourse about learning learning is an acquired process and it involves acquisition of either knowledge, skill and/or abilities. It is therefore foolhardy to assume that learning can take place in a vacuum. The definitions of learning above can bring home some principles that learning is practicable only among humans. It is a process and a vital process for that matter because it ensures biological existence and intellectual growth of the individual. It is only through learning that an individual can achieve a genuine relationship with himself and the world says Schorder (2017) in Kadiri (2014).

Learning therefore, results in a change of behavior because it is evidence-dependent; for learning to have taken place, there should be evidence or a manifestation of such learning. Learning occurs unconsciously but most or nearly all school learnings are conscious (intended). The conceptualization of learning is clearer "Learning is a process by which skills, attitude, knowledge and concepts are acquired, understood, applied and extended; it is partly a cognitive processed, partly social but successful learning should result in confidence, pleasure and in a sense of achievement" (Andrew, 2010).

16.9 Concept of Traditional Learning

Traditional method of teaching and learning is when a teacher directs students to learn through memorization and recitation techniques thereby not developing their critical thinking problem solving and decision making skills (Sunal et al 1994) while modern or constructivist approach to teaching involves a more interacting, student-based of teaching. Here, the students learn through group participation.

Most of the higher institution of learning uses the lecture method which is also a traditional teaching and learning strategy. Lecture method of teaching is the oldest teaching method applied in educational institution. This teaching method is one way channel of communication of information. Students' involvement in this teaching method is just to listen and sometimes pen down some notes if necessary during the lecture, combine the information and organized it (Essays, 2018).

One of the problems in this method is to grab the attention of students in class room. Another big problem is that many students in the class cannot follow the theme. Learning has a strong influence on method of teaching.

16.10 Concept of Personalized Learning

Personalized learning has been used as far back as the 1920s when Helen Parkhurst created the Dalton Plan, which aimed to create a balance between a child's talent and the needs of the community (Parkhurst, Bassett, Eades, & Rennie, 2024). Specifically, its first objective was to tailor each student's program to his or her needs, interests and abilities and to allow every school child to have the opportunity to freely choose a series of activities, already predisposed by the teacher, to fully improve intellectual, social and moral growth. These were only ideas and theoretical practices that did not require any form of technology, including mechanization. Practices that were mechanized with earlier technology to achieve competencies based on the history of responses of the learner were utilized as early as the 1930s (Savio-Ramos, 2015). By the 1960's, researchers had already moved beyond systems that presented instruction in a pre-determined fashion, which employed some form of technology. These types of systems were considered to be adaptive in nature, adjusting as necessary to learners' needs in an effort to move towards a more student-centred approach to learning (Hwang, Sung, Hung, Huang, & Tsai, 2012). It was not until the 1970s that the term "personalization" in the context of educational science was introduced and coined by Victor Garcia Hoz (Hoz, 2022).

16.11 Concept of Artificial Intelligence

Artificial intelligence is a part of computing science that focuses on creating intelligent machines and programs. The purpose of artificial intelligence is to try to mimic human consciousness and perform tasks such as human beings. In practice it means the ability of a machine or program to think and learn. Generally, the term artificial intelligence means a machine or program that tries to emulate human consciousness. AI has become a significant part of the technology industry. (Tekoäly 2018).

AI has had three stages throughout the history of AI, in 1950's – 1970'S the so called neural networks era, 1980 - 2000 the machine learning era and deep learning era in the present day. A neural network is a form of machine learning that is made up of interconnected units (like neurons) that processes information by responding to external inputs, relaying information between each unit. The process requires multiple passes at the data to find connections and derive meaning from undefined data. Machine learning automates analytical model building and uses different methods such as; Neural networks, operations research, statistics and physics to find undisclosed insights in data without decidedly being shown where to look or what to achieve. Deep learning is almost similar to machine learning but on a deeper level. The goal of deep learning is to create a nerve network using the algorithm that can solve the problems it has been given. It is used in particular to solve problems where solutions with traditional methods would require very complex rules. Deep learning is used, for example, in identifying or handling speech, images and texts (Pottala, 2018).

An algorithm is a step by step method of solving problems. It is regularly used for data processing, calculation and other mathematical and computer operations. It is an accurate series of instructions for carrying an operation or solving a problem. Algorithms are able to do various tasks easily and quickly, when appropriate data is entered into the system. (Techopedia 2018). The most influential factors in the rise of AI now are computing ability and power, data and algorithms. The power and ability of processors have significantly increased. Today there is an enormous amount of data available of the weather, social media and medical science, and machines are finally able to exploit this data. At the same time, the storage costs for data management have fallen and the development with data storage have led to a faster way to analyze massive amounts of data. (Tekoäly 2018).

There are two types of AI, narrow AI and general AI. Narrow AI can solve one problem, to which it is taught, for instance to identify cancer by using machine vision, to organize personal and business calendars and to respond to simple customer service queries. Practically, all the current AI is narrow AI. General AI solves

a wide range of different problems, drives cars, understands languages and cooks. General AI have not reportedly been developed yet, but AI experts are fiercely divided over how soon it will become a reality (Pottala, 2018).

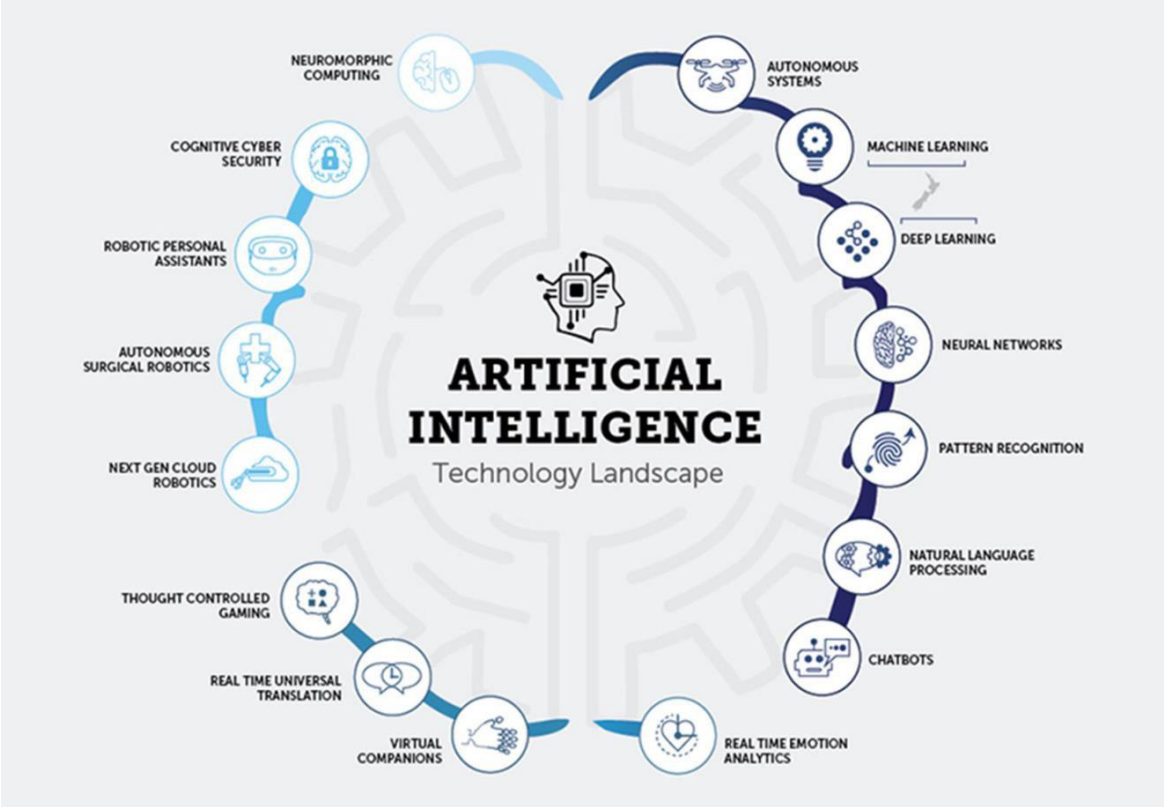


Plate 1: Artificial Intelligence (Source: Pottala, 2018)

16.12 Concept of Intelligent Tutoring System

Intelligent Tutoring System is a computer program designed to simulate the behaviour and guidance of a human teacher. These systems help students study a variety of topics by asking questions, analyzing responses, and providing customized instructions and feedback. According to Husanein (2018), the Intelligent Tutoring System features a variety of other computer learning systems. These features can be grouped into two main points:

- It can explain the complex answers of students and distinguish whether these answers are true or false.
- The program builds a profile for each student and assesses the degree of mastery of the student in the subject.

This type of system can alter the behaviour of private lessons in real time, after differences in individual student strategies or modify their knowledge base to interact more effectively with all students. For an intelligent teacher, the goal is not only to know that the answer is incorrect but that the student knows why this response is wrong. To achieve this, the system monitors responses through a number of intermediate steps to determine what is most accurate and why the student thought wrong (Akkila, & Abu Naser, 2017).

16.13 Concept of Academic Performance

Academic performance of a child could be defined as the learning outcomes of the child. This includes the knowledge, skills and ideas, acquired and obtained through their course of study within and outside the

classroom situation (Okorie, 2014). It is the outcome of determination, hard work, of student in academic pursuit.

Pandey, (2018) defined academic achievement as the performance of the pupils in the subjects they study in the school. This determines the pupils' status in the class. This gives children an opportunity to develop their talents, improve their grades and prepare for future academic challenges. Academic performance refers to a person's performance in a given academic area (e.g. reading or language arts, mathematics, science and other areas of human learning. Academic performance relates to academic subjects a child studies in school and the skills the child is expected to master in each (Kathryn, 2010).

Academic performance refers to excellence in all academic discipline, in a class as well as extra-curricular activities. It includes excellence in sporting behaviour, it includes excellence in sporting behaviour, confidence, communication skills, and others. Steinberger (2015) posit that academic performance encompasses students' ability and performance; it is multidimensional; it is intricately related to human growth and cognitive, emotional and social physical development; it reflects the whole child; it is not related to a single instance, but occurs across time and levels, through a student's life in public school and into post-secondary years and working life. Academic performance refers to how well a student is accomplishing his tasks and studies.

16.14 Related Literature

The first section reviews related literature on the concept of Educational technologies that support teaching and learning, followed by the subsection which reviews literature on the concept of role of technology in Personalized learning, barriers to personalized learning and artificial intelligence technologies for teaching and learning. The final subsection reviews literature on the impact of AI on Education.

16.15 Educational Technologies that Supports Teachers and Students

During the last decades, is possible to observe a large number of tools, applications, computer systems that primarily focus on the student interaction or learning strategies centered on the student. For instance, it can be found some role games, tutor interfaces, student networks or interactive platforms with the aim to improve cognitive skills. Then, all the components inside these tools include the work of engineers, designers, educators and so on in order to understand the student and provide a solution centered on the experience of the user.

Likewise, in the same level as students can improve their learning process through the use of technology, teachers also required some support from the technology to improve their performance and their role as tutors on the education system. Conversely, developers are failing on the way the tools are cognitively designed, as their work required management of a big amount of data and information, the language of the technology get more complex than the one implemented for students. As a consequence, when a teacher finds a confusing and unfamiliar group of elements on these tools, they normally abandon it, getting back to their usual strategies. This way is necessary to understand and transform the power of those new technologies on instruments able to be used by the user and design for them (Diaz, 2019).

As a matter of fact, and as mentioned before on the analysis of education systems, an important reason for the failure of teacher's performance is the low motivation they have. Eventually, those motivations can be represented as monetary incentives but also related to the supportive instruments, plan, or strategies they received that facilitates their work, helping them to save some time that is also expressed as an element of motivation. In other words, "To ensure stable adoption of technology, a holistic approach to staff development that is connected to performance management and recognizes individual development has a greater impact than an isolated technology-only approach" (Samarawickrema & Stacey, 2017).

In this context, Educational Technologists has been working on tools able to help teachers from different perspectives: data management, strategies for evaluation, communication tools and tutoring systems. All these categories of technology will be explained on the following pages, in order to recognize its applications and identifying its value and issues from the user perspective.

16.16 Learning Management Systems

The first type of system presented as a supportive tool for learning and teaching environments is the Learning Management Systems (LMS) that is defined as a "web-based software used for the delivery, tracking, and managing of education online" (Islam, 2015). Usually, LMS is one of the main providers of distance education but it does not mean that cannot be implemented on traditional teaching, as it includes some features that facilitate in general terms the educator work such as the organizational benefits these platforms provide.

Consequently, during the development of this kind of system is mandatory to include the student and teacher perspective, in order to identify its value from both points of view in order to recognize the features it might include to be efficient. "Educators can track the progress of their students using such software, while students may submit their assignments, download course materials, and track their grades by logging on to the system. They can interact with others, control their own learning, develop deep thinking skills, and develop a sense of community with other learners" (Tay, Lim, Lye, Ng & Lim, 2011). Similarly, LMS has a market that expects to have a valuable increase related to the investment in research and as a business plan. Indeed, "Global LMS market is expected to grow from US$ 5.05 billion in 2016 to US$ 18.44 billion by 2025 at a CAGR of 15.52% between 2017 and 2025"36 (Market Report, 2017). According to the a Global Forecast Market Report (2018), "increasing the adoption of digital learning, growing inclination towards, Bring Your Own Device (BYOD) policy and enterprise mobility, extensive government initiatives for growth of LMS, growing usage of AI and Machine Learning (ML) in LMS is increasing the significance of eLearning in the corporate and academic setups" (Market Report, 2018), and predicts an increase on its investment. Conclusively, the use of this kind of systems is common on the market, and is not only applied on education environments, is an industry that can be applied in different fields that involve professionals and a large amount of data needed to be processed and organized.

16.17 Monitoring and Evaluation Systems

A Monitoring and Evaluation System (MES) is created to control the impact that a programmed activity, teaching plan or policy established is able to evidence progress, effectiveness, efficiency, and sustainability. This kind of systems is being developed in order to find the positive features and the issues of the strategies implemented on the education systems, which means it tends to focus on teacher and students performance, providing feedback according to the information collected by the system during its use (Diaz, 2019).

MES research has increased in the last decade, as developers continue exploring the features of high technology as AI, that for instance has provided new methods of understanding and recognizing students' emotions, and how it affects their performance on learning processes. More specifically, similar work was done by a group of experts that were trying to capture some gestures of the student faces identifying the difficulties they have during the performance (Carvalho et al, 2015).

Generally speaking, MES purpose is to provide a higher quality of education by the use of technology as a supportive tool for teachers but also the rest of actors involved in the system, in order to make decisions based on veridical data. However, quality education is an enormous concept that required a variety of disciplines to be connected and strategically situated to achieve the desired objective, then is necessary to "take into account the quality aspects on input (human, material, and financial), process (teaching, learning and effective management practices), and outputs and outcomes (the learning outcomes and quality of results)" (UNESCO, 2016).

16.18 Communication Systems

Communication Systems (CS) are considered tools that allow and facilitate the connection between the different actors inside an education system (students, teachers, parents, institution manager, etc). This way is possible to construct a network between the parts in order to improve, assist and optimize the experience of teaching and learning. Usually, this system provides updated information, events, new ideas and impulse

the creativity of the students through sharing with other students or professors, and some other features (Diaz, 2019).

Likewise, on EdTech for CS is popular the use of channels of communication such as district and institution website, mobile apps, notifications and alerts, email, social media and video. Each of these channels has and provide a different type of information according to its complexity and the capacity of the channel itself. For example, is not the same sort of contents when the actors interact through an institution platform than the use of websites like Twiducate, because on the first one usually the student and the teacher can share some work, contents and evaluation scores, while on Twiducate permit a more personal experience between them, constructing the courses online as well.

16.19 Role of Technology in Personalized Learning

The traditional classroom structure, with all students learning in the same place and at the same pace, is no longer feasible for today's educators (Grant & Basye, 2014). According to researchers and educators with the USDOE (2010), "[Technology] frees learning from a rigid information-transfer model (from book or educator to students)". The use of technology creates opportunities for teachers to release control of learning and experiences to students and produces opportunities for them to choose how, when, and where learning occurs, which reduces barriers (Grant & Basye, 2014). According to Zmuda, Curtis & Ullman (2015):

> *Personalized learning requires not only a shift in the design of schooling but also a leveraging of modern technologies. Personalization cannot take place at scale without technology. Personalized learning is enabled by smart e-learning systems, which help dynamically track and manage the learning needs of all students, and provides a platform to access myriad engaging learning content, resources and learning opportunities needed to meet each student's needs everywhere at any time, but which are not all available within the four walls of the traditional classroom.*

The integration of technology, referred to as a "revolutionary opportunity for change" in the National Education Technology Plan (USDOE, 2010), has allowed students and teachers to transform the educational experience (Grant & Basye, 2014; USDOE, 2010). Technology should not be used to digitize a traditional system, but should improve learning for all students by allowing student control over pace and place of learning, increased opportunities for collaboration within and beyond the classroom walls, and immediate access to information (Grant & Basye, 2014; Zmuda et al., 2015).

Impact of technology on learner profiles. Educators collected learner profile data long before classrooms were filled with technology, but prior to refined tech tools, student record management was insufficient to meet the needs of teachers (Bailey, Carter, Schneider & Ark, 2015). In the past, teachers had limited visibility into previous learner profiles, requiring each educator to collect his or her own learner data (Bailey et al., 2015). Current software, web tools, and learning management systems (LMSs) allow students and teachers to construct digital portfolios that contain a lot of background information about each child to assist with personalizing learning for each student (Bailey et al., 2015). By having the data travel with the student, educators can begin personalizing learning on day one (Bailey et al., 2015).

Impact of technology on learner voice and choice. Technology has impacted learner voice and choice in slightly different ways. DeWitt (2015) stated, "Without student voice, technology just fosters another type of compliance. [Therefore, it] will be just as boring for students as the chalkboard and lecture methods" (DeWitt, 2015). A variety of web tools have been incorporated into classrooms to allow student voice to be collected in an efficient and useful manner (Ledesma, 2011). Students can provide feedback and opinions through survey tools such as Google Forms, blog about topics or issues that are important to them, or create their own videos to share ideas that pertain to a particular topic (DeWitt, 2015).

Educators can allow for student choice in a variety of ways as well. Interactive choice boards allow students to select how they will learn about the topic being studied, or students can have choice in how

they present or deliver content they learned through technology (Ronan, 2015). For example, students might all have to research a topic but could have the choice to create an animation, slideshow, or interactive mind map depicting their findings (Ledesma, 2011). When students have choice in their learning, problem solving and authentic learning are incorporated into the experience, thus making the learning more meaningful (Ledesma, 2011).

Impact of technology on multiple instructional methods and modes. Prior to the technology era in schools, multiple instructional methods were used, but shifting to blended and online learning has radically developed as internet access becomes faster and more reliable, devices become more affordable, and online content becomes more engaging (Horn & Staker, 2015). As knowledge acquisition for students has moved more online, more class time is available for collaborative projects, Socratic discussions, labs, etc. (Horn & Staker, 2015). Improved technology and software has also allowed classrooms to have more experts than just the teacher, as adaptive software and research databases can help students learn individually while the teacher works with a different small group of students on a face-to-face lesson (Horn & Staker, 2015). Teachers have gained freedom and students have gained a personalized education through the use of technology (Horn & Staker, 2015).

Impact of technology on rapid cycle feedback. Teachers and students today have access to technology tools that personalize instruction and provide feedback in the form of real-time data, so interventions and redirections occur immediately to support the pace of individual learners (Abel, 2016). Many curricular software programs now include features that allow students to complete homework online and then receive immediate feedback based on their answers, allowing students to make an adjustment in how they approach a problem (Sun, 2012). Similarly, students working in adaptive software programs not only receive immediate feedback based on answers, but the learner's pathway within the program is customized based on how a student answers each problem (DreamBox Learning, 2016). There is a long list of various tech tools teachers can use to provide feedback to students including the comment feature within Google Docs, recording video comments within a learning management system, commenting on student blogs, and allowing students to provide peer feedback using the previously mentioned tools and more (Hertz, 2012).

Impact of technology on progressions toward deeper learning. Deeper learning is possible for today's learners through enhanced access to "expanded options and extended reach" (Ark & Schneider, 2014). Enhanced access includes access to high quality teachers and content through always-available online resources; quick, sometimes immediate, feedback that allows for acceleration; and multiple pathways to master content that was previously unavailable (Ark & Schneider, 2014). Technology advancements have also improved collaboration and communication tools, which positively impact two of the deeper learning competencies (Ark & Schneider, 2014).

Today's learners can now collaborate with virtual teams, create collaborative projects, and have the ability to produce high quality communicative documents and work products (Ark & Schneider, 2014).

Impact of technology on learner independence. With the advancement in technology, students adapted quickly to independently learning outside of school. The following statistics were provided in the Speak Up 2011 report produced by Project Tomorrow (2012):

- 1 in 10 students in grades 6-12 have sent out a Tweet about an academic topic that interests them;
- 15% have informally tutored other students online or found an expert to help them with their own questions;
- 18% have taken an online assessment to evaluate their own self-knowledge;
- One-fifth have used a mobile app to organize their school work;
- 1 in 4 have used a video that they found online to help with homework;
- 30% of middle school students and 46% of high school students have used Facebook as an impromptu collaboration tool for classroom projects;

Almost half of the high school students have sought out information online to help them better understand a topic that is being studied in class.

The inclusion of technology during the school day also fosters independence by allowing students to research from numerous resources, review content in a variety of ways (e.g., video lessons, text), access online curriculum, set and receive reminders and alerts to manage learning, and collaborate and communicate with peers and resources in and beyond the school building (Project Tomorrow, 2012).

Impact of technology on co-designing learning. Adaptive learning systems have become an effective tool to assist teachers in personalizing content to students (Bray & McClaskey, 2015; Rickabaugh, 2016). Khan Academy (2016) staff advertise their site as "a personalized learning resource for all ages: Khan Academy offers practice exercises, instructional videos, and a personalized learning dashboard that empower learners to study at their own pace in and outside of the classroom". Some adaptive software programs allow content to be personalized by the student, although the content is typically limited by what the student is ready to learn (DreamBox Learning, 2016). In DreamBox, students are able to select lessons that are available based on the students' knowledge level (DreamBox Learning, 2016).

Impact of technology on flexible learning spaces. Prior to devices becoming smaller and more portable and the infrastructure becoming wireless and faster, students reported to a computer lab to access technology (Bray & McClaskey, 2015). Students had limited access to labs due to scheduling issues or lack of supervision (Bray & McClaskey, 2015). With easier access to technology due to lower cost, more options, and high demand, devices are infiltrating classrooms at a rapid pace (Bray & McClaskey, 2015). Most devices included in a 1:1 initiative are portable, wireless devices, which allow students to move freely through the flexible learning space without having to worry about being tethered or connected to a wall (Bray & McClaskey, 2015).

Impact of technology on flexible time and pace. Various advances in technology have allowed students to work at a pace appropriate for their ability level (Grant & Basye, 2014). Students can read the same information at varying reading levels and might also have access to text-to-speech or other assistive technology features, which ensure learners with varying levels of ability can access text (Grant & Basye, 2014). The progression of technology has also brought about concepts like the flipped classroom, which enables students to watch videos or lectures outside of the classroom related to topics studied in class (Bray & McClaskey, 2015). By viewing the recorded material on one's own time, the learner can review the content at an individualized pace and as often as needed (Bray & McClaskey, 2015). Furthermore, one in four students has accessed an online video, without being directed by a teacher, to assist with a homework assignment or project (Project Tomorrow, 2012).

Finally, students can learn at an individualized pace using one of the many adaptive software programs available (Bray & McClaskey, 2015). One example, Khan Academy, allows learners to watch instructional videos, practice skills, and obtain feedback so they can study at a pace that is comfortable (Khan Academy, 2016). While incorporating multi-level texts, a flipped classroom, or adaptive software does not ensure a personalized learning environment, the technology-based concepts allow students more control over the pace of their learning, which is an element of personalized learning (Bray & McClaskey, 2015).

16.20 Barriers to Personalized Learning

School structure. Theodore Sizer as cited in Pilley (2016), a leading activist for personalized learning, outlined the current rigid organizational system found in most schools in America, which keep personalized learning out of the classrooms:
Students are grouped in classes by age.

Assessments are administered by grade level rather than by student readiness, and students are marked as successful or unsuccessful according to their test score on one day.

Students are promoted through "social promotion," a practice where students are promoted to the next grade level whether or not they master minimum grade level standards or expectations.
Teachers deliver content confined within a subject matter and subjects are taught in isolation from one another.

Courses and content are taught in a sequential, lock step manner according to grade level rather than student readiness or interest.
The current high school model is "something for everybody," but options within that model are different from personalization (Pilley, 2016).

Standardized testing. The era of standardized testing produced a host of barriers to creating personalized learning environments (Amrein & Berliner, 2003; Bray & McClaskey, 2015). These assessments, which are often tied to financial support for schools, decrease student motivation to learn (Amrein & Berliner, 2013). According to Amrein and Berliner (2013):

> *High-stakes testing assumes that rewards and consequences attached to rigorous tests will "motivate the unmotivated" to learn. Yet researchers have found that when rewards and sanctions are attached to performance on tests, students become less intrinsically motivated to learn and less likely to engage in critical thinking.*

Standardized testing also causes teachers to control student learning experiences to a greater degree, thus decreasing opportunities for students to steer their own learning (Amrein & Berliner, 2013). According to Amrein and Berliner (2013), "When the stakes get high, teachers no longer encourage students to explore the concepts and subjects that interest them".

Some schools have resorted to reducing or eliminating courses or activities outside of the tested subjects during this high-stakes testing era (Amrein & Berliner, 2013). When schools need to increase test scores on state assessments, often "art, music, creative writing, physical education, recess, ROTC, and so forth are all reduced in time or dropped from the curriculum" (Amrein & Berliner, 2013). This can be detrimental for some students who thrive in the co-curricular content areas (Dwyer, 2011). Finally, by focusing on standardized assessments, teachers and students have to cover a very broad curriculum with few opportunities to gain a deeper understanding of content (Amrein & Berliner, 2013).

Control of the learning experience. Aside from the rigid organization of schools, the personalized learning movement itself presents the issue of control, on which leading experts cannot even agree (Zmuda et al., 2015). Zmuda et al. (2015) offered a simple continuum to depict control over the learning experience from "teacher-driven learning experience" to "student-driven learning experience". Richardson, an advocate for change in schools and classrooms that align with the diverse new learning opportunities the internet and other technologies now offer, insisted, "Students now have the ability to create a personal curriculum around the things they truly care about learning out of the abundance of information, people, and tools they now have access to" (Richardson, 2014). On the other hand, Meyer as cited in Pilley (2016), an advocate for better math instruction, spoke to the power of teacher-led instruction to deliver and assess content. He theorized giving students control to "determine path and pace…will lead to 'large knowledge deficits' in many students, especially those at risk" (as cited in Zmuda et al., 2015). Zmuda et al. (2015) advocated for "a balanced approach through which the teacher and student collaborate in the design of the learning experience".

Wide-ranging definitions of personalized learning. A barrier to true personalized learning is the misconception some trendy initiatives equal personalized learning, when often the teacher is still controlling the learning rather than partnering with the students (Bray & McClaskey, 2015). A few of the programs confusing the term include the following: Adaptive Learning Systems, Blended Learning, Differentiated Instruction, The Flipped Classroom, 1:1 Programs, Project-Based Learning, and Individualized Education Plans (IEPs) (Bray & McClaskey, 2015). While these programs could enhance or factor into personalized learning, if the teacher continues to "direct what and when each learner learns," personalized learning is not occurring (Bray & McClaskey, 2015). To fully implement the personalized learning approach, it is imperative educators "build a common language around personalized learning so everyone…has a shared meaning and understanding…around a similar vision, goals, and activities" (Bray & McClaskey, 2015).

In order to overcome barriers to personalized learning, educators must focus on changing instruction and mindsets rather than "school structures (for example, block scheduling, competency-based

systems,technology)" (Zmuda et al., 2015). According to Frontier and Rickabaugh (2013), "Education is littered with well-intended transformational changes in practice. Too often, the surface-level changes that were implemented resulted in neither improved organizational capacity nor improved student learning". In order for personalized learning to become a deeper change, Zmuda et al. (2015) offered the following advice:

The evolution to personalized learning is an adaptive change; it's hard, it's disruptive, and it creates uncertainty. These deep and transformational changes require leaders, teachers, and students to examine and oftentimes abandon deeply held beliefs in order to reframe the role of the teacher and the student, the nature of what is to be learned, and the way in which it is learned.

Moving toward a personalized learning approach does not eliminate or even diminish the need for the classroom teacher; it merely shifts the role of the teacher from the lead resource and deliverer of information to a "curriculum planner, classroom facilitator and coach, assessor, advisor, communicator, and connector" to form a learning partnership between the teacher and the student (Zmuda et al., 2015).

16.21 Artificial Intelligence Technologies that Supports Teachers and Students

The last decades have observed a large number of AI based tools and applications that primarily focus on the student interaction or learning strategies centered on the student. They include;

Intelligent Tutoring Systems (ITS)

This is a term commonly known on the literature related to applications of AI systems on EdTech. Starting from a general point of view, an Intelligent Tutoring System (ITS) is an "interdisciplinary field that investigates how to devise educational systems that provide instruction tailored to the needs of individual learners, as many good teachers do" (Schoksey, 2014). In other terms, ITS, is a computing technological instrument which purpose is to provide an individualized learning experience to the student. During the years, ITS has been studying some relevant characteristics needed to increase the quality of the service, as the value of communication on user's interaction with the system, mostly through conversational dialogue technologies, or the denominated Chat-bots (influenced by Artificial Intelligence systems).

Usually, an ITS, includes four main components that interact during its performance to achieve the desired result, their connection can be evidenced on the figures 1 and 2. Likewise on figure 1 and 2, it is possible to observe the general structure of an ITS, which allow us to recognize the specific moment where the user is situated and the interactions of the elements when the input goes inside the system, processing the information and providing an output to the user as well.

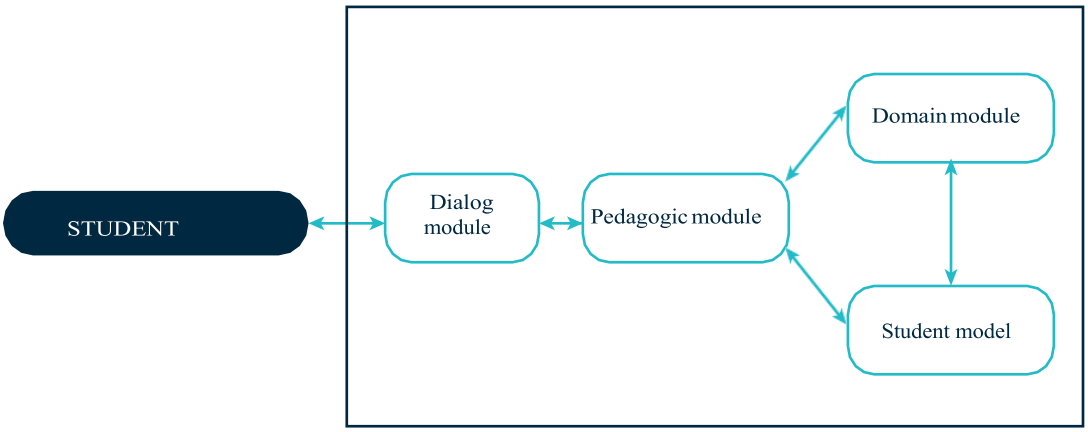


Figure 1: Main components of an Intelligent Tutoring System (ITS)

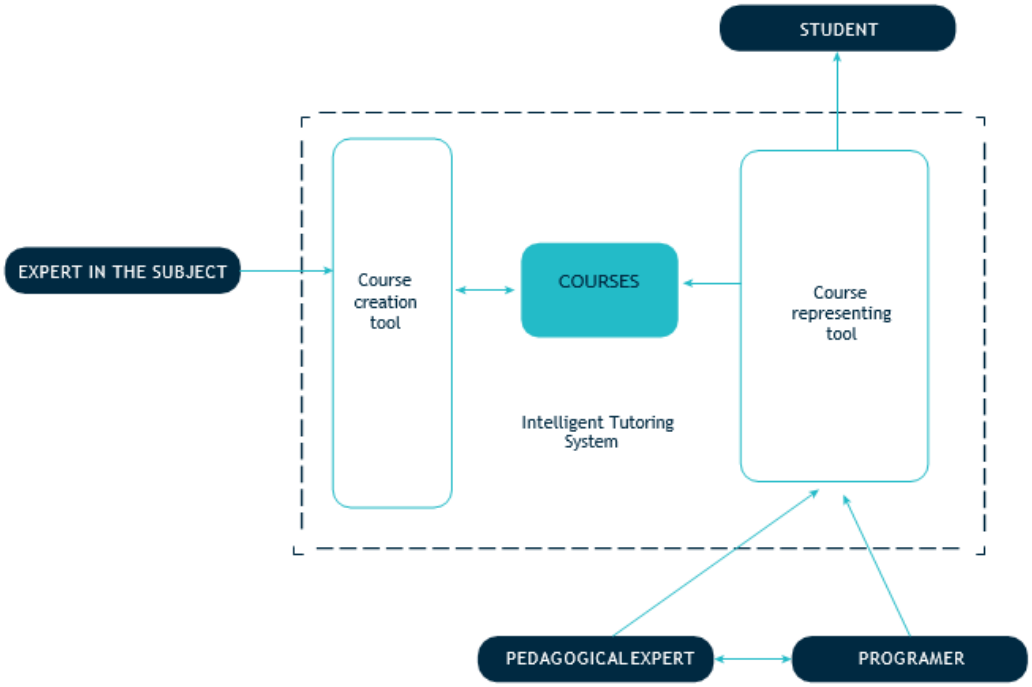


Figure 2: The general structure of the Intelligent Tutoring System (ITS)

16.22 Content-Oriented Learning Systems

The term of Content-Oriented Learning Systems (COLA), borns on experimental research from a team of students, professors of Politecnico di Torino and Politecnico di Milano, besides the support of experts on AI technology from IBM Milan. This type of system was created to "build learning conversations using modern AI approaches based on a good and well-organized body of content" (Akcora et al, 2018) and the guidelines of the project are the ones evidenced on the figure 3. The experiment was done with the contents of the course of 8th grade of school in mathematics.

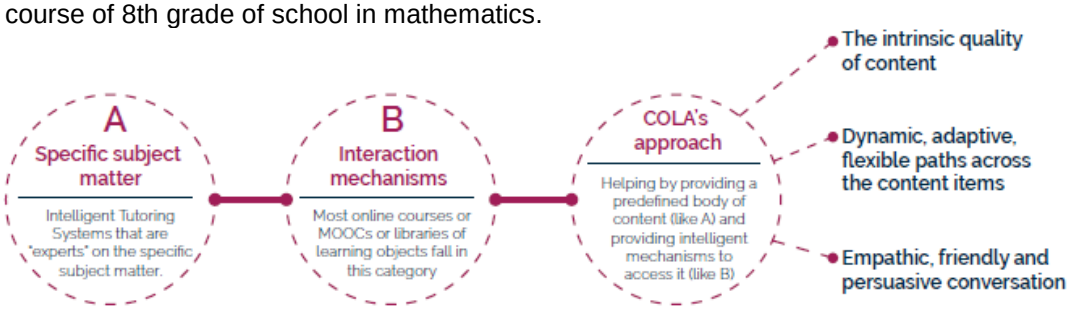


Figure 3: Main directions for an application supporting learning, COLA system

Impact of AI on Education

AI technology has been explored and applied in a variety of industries to progress in term of data and information management, its collection and process to create more efficient systems inside machinery, services, products, and production processes.

From this perspective, the education industry is also immersed on those who are implementing the power of AI as a computer system looking to achieve benefits on the teaching and learning processes in order to improve the quality of the education systems. Particularly, AI can modify educational resources, providing supportive tools to educators, connecting students and teachers all over the world, getting better solutions

to people with some special difficulties; all of these through the construction of intelligent platforms and the ability of mixing realities that enable the users to experience the things around them in ways that was not even thinkable before (Diaz, 2019).

Consequently, a large variety of research and studies on this field has established some benefits of using AI technology on EdTech, however, it has not been clear what are the limits of the technology and even if is a powerful processor of information and a technology able to learn, it cannot be put at the same level as the human intelligence. For this reason, the inclusion of AI in education need to be accompanied by the right establishment of functions that it is capable of developing and the big difference between providing information and constructing knowledge. In other words, developers of AI on education need to clarify the role of the technology as a supportive tool not as a replacing element of teachers role in learning environments, because is them who necessarily need to be behind the technology in order to achieve valuable results on the process of learning of the students (Diaz, 2019).

Therefore, the key element to keep in mind with the introduction of this new technology on education, is the challenge that the teachers must face and, as the technology might help with some of their work at the same is going to test and ask for an intensification of their role as tutors and as drivers for the construction of knowledge and critical thinking of students, based on the recognition of the environment and the elements that move around them, which can only be recognized under their own experiences as human beings through social interaction and personal analysis.

On the other hand, is not a secret that behind every industry there is a group of people trying to reach a profit or a monetary benefit from the development of this type of technology. Which means, the idea of AI can be sold to governments or institutions leaders as the solution for reducing the human capital (teachers). For this reason, and from the ethical point of view, developers need to recognize, design and share the right information about AI, because in the majority of the studies taken into account for this thesis, developers tend to focus on the features of the technology but forget about the most important element of the design of a product, the user requirements, profile, and its value on the project, in other words looking to obtain a human centred approach. Hence, “it is certainly true that we need to engage a more diverse population in acquiring the skills to design and develop the future of our artificial intelligence” (Luckin, 2018).

From this context, Professor Rosemary Luckin (2017) introduce two dimensions from where AI should be addressed from the education point of view and based on the following questions: How can AI improve education and help us to address some of the big challenges we faced? How do we educate people about AI so that they can benefit from it? This way, throughout this section it will be presented information related with the concept, characteristics, limits and significant examples of the application of AI technology on education in order to construct a scenario of what is AI, and where should it go to the future education.

Empirical Studies

Gambari, Falode, & Adegbenro (2014) carried out a study titled ‘the effectiveness of computer animation and geometry instructional model on mathematics achievement and retention on Junior Secondary School Students in Minna, Nigeria’. It also examined the influence of gender on students’ achievement and retention. The research was a pre-test post-test experimental and control group design. 40 junior secondary school students were drawn from two secondary schools within Minna metropolis. Stratified random sampling technique was used to select 40 students (20 males and 20 females). The Geometry Achievement Test (GAT) was used for data collection. The reliability coefficient of 0.87 was obtained using Kuder-Richardson (KR-20). GAT was administered to students as pre-test and post-test. The students’ pretest

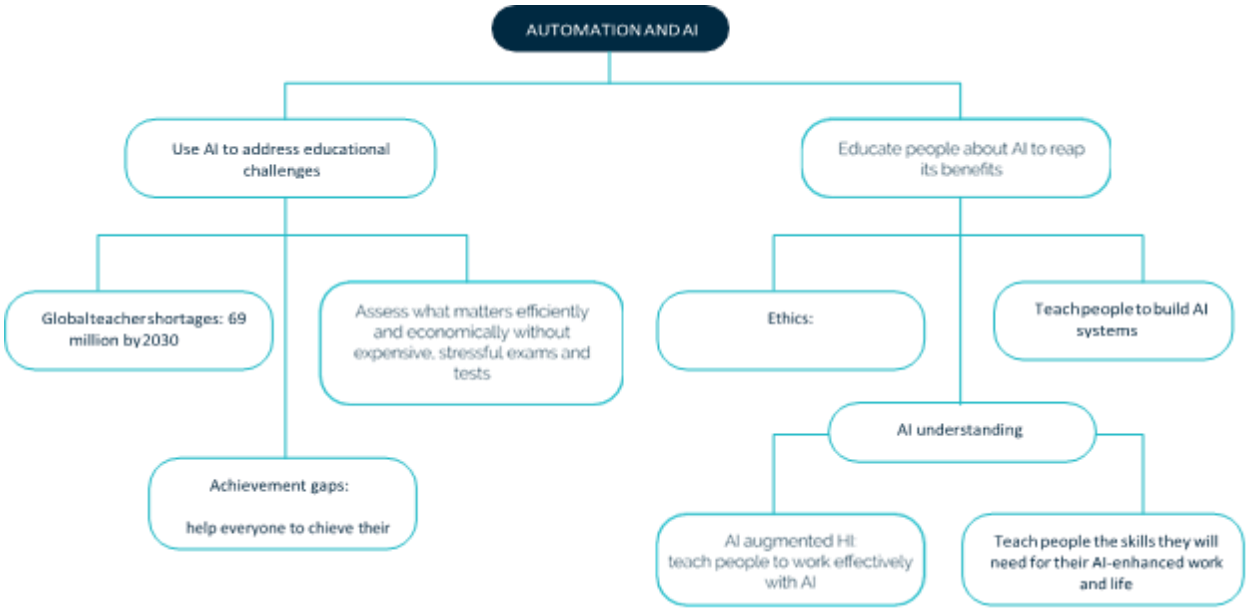


Figure 4: The AI and education knowledge tree with its two dimensions

and post-test scores were analyzed using t-test statistics. The results indicated that the students' taught geometry using computer animation performed significantly better in post-test and retention test than their counterparts taught geometry using instructional model and conventional method respectively. However, there was no significant difference reported in the post-test performance scores of male and female students' taught geometry using computer animation and instructional model respectively. These findings indicated that geometry concept in mathematics could be taught and learnt meaningfully through the use of computer animation.

In a carried out a six – week research John (2016), carried out on the effect of ICAN learn software as a tool on students' achievement and retention in Algebra. He adapted a quasi-experimental research design (treatment Vs. Control group design) with 124 ninth-grade beginning Algebra I students assigned to five treatment classes using a combination of computer and teacher instruction and 68 students assigned to teacher instruction only as control group. Results of his findings indicated that ICAN learn (R) Students performed better than control students by a statistically significant margin on both the pre-test and post-test. In addition, he observed that, students' retention of materials appeared to be greater with ICAN learn (R) computer assisted instruction.

Also, Ozofor (2011), carried out a study on the effect of two modes of computer Aided instruction on students' achievement and interest in statistics and probability. His study was carried out in Enugu education zone of Enugu State. A sample of ten intact classes, made up of between 20 to 40 students was used for the study. The design was quasi-experimental. His finding among other things indicated that: Students performed better with the Computer Assisted Instruction than with the conventional method and also that students performed better and became more interested in tacking mathematics problems when drill and practice method was used than when the tutorial method was used. More so, that practicing at the computer terminals stimulated more and helped students retain more of what they have learnt; that female students performed better than their male counterparts when drill and practice method was used. This study is different from the present study in that, the present study will compare computer as tutor and as tool using intelligent tutoring application and computer Algebra application software respectively.

Again Etukudo (2012) in his own research on the effect of computer Assisted Instruction on gender and performance of Junior Secondary School Students in mathematics, reported that there was no significant difference between male and female students achievement in mathematics. He carried out his research in

Ogba / Egbema / Ndoni Local Government Area of River State. A sample of 40 students was used for each group, 20 were males while 20 were females. The design was quasi-experimental.

Micheal (2012) carried out a study on Computer-Assisted Instruction versus Traditional Classroom Instruction: Examining students' Factoring Ability in High School Algebra one. The purpose of his study was to examine the effectiveness of computer – assisted instruction compared to the traditional instruction of a classroom teacher in mathematics. The study also examined the perceptions of students' experiences using computer assisted instruction and its ability to meet their educational needs. He used the computer as a tool. The study was carried out in North Carolina. Four research questions guided the study. A sample of 50 students was used; 25 in the experimental group that used on-line learning system, called NOVANET to learn factoring in Algebra while the other 25 students received traditional classroom instruction on factoring. The design of the study was quasi-experimental. His findings indicated that; there was no significant difference between the two forms of instruction. Students also did not show any significant difference in retaining the information taught. Some students did recognize the power of the computer and suggested that both forms of instruction be integrated.

Safo, Ezenwa and Wushishi (2013) carried out a study to determine the effectiveness of Computer-Assisted Instructional package (CAIP) on achievement and retention in geometry among junior secondary schools in Minna Metropolis. Two research questions were raised and two null hypotheses were tested. The study adopted the pre-test-posttest - control group design. Simple random sample of eighty (80) students were drawn from four junior secondary schools in Minna Metropolis. The researcher developed computer assisted instructional package on geometry which was used as treatment instrument for experimental group while control group were exposed to traditional teaching method. The instrument for data collection was Geometry Achievement Test. A 40-items multiple-choice objective type achievement test covering ten selected topics in Geometry was used. A reliability coefficient of 0.75 was obtained using Pearson's product moment correlation coefficient(r).The t-test statistics was used to analyze the hypothesis. The findings revealed that experimental group performed better than the control group. It was recommended that government should organized seminars, workshops and symposium for teachers on the development of computer assisted instructional package to enhance learning among students.

Keşan and Çalişkan (2013) carried out a study to investigate the effect of learning geometry topics of 7th grade in primary education with dynamic geometer's sketchpad geometry software to student's success and retention. The experimental Research design with The Posttest-Only Control Group was used in this study. In the experimental group, dynamic geometer's sketchpad geometry software adapted to Computer assisted instruction; and in the control group, traditional teaching method was used. Quantitative research approaches were adopted in the study. Data was collected through 6th grade SFBS (state free boarding and scholarship) 2005 test, achievement test and worksheets. Mann Whitney U test and Wilcoxon signed-rank test were used to analyze the quantitative data of the study. As a result of this study, it was found that there was a significant difference between achievement test scores of experimental group learning geometry with GSP dynamic geometry software and control group learning through traditional method in favor of experimental group.

Aruwa (2015) conducted a research to determine the effect of practical application on senior secondary school students' interest and achievement in mathematics. The study was carried out in Karu local government area of Nasarawa state. A sample size of one hundred and thirty seven (137) senior secondary two students was used. The study was a quasi-experimental design. Data were collected from the subjects i.e. Mathematics using two (2) instruments namely: Mathematics Achievement Test (MAT) and Mathematics Interest Inventory (MII). The MAT and MII had reliabilities of 0.86 and 0.63 using Kuder-Richardson formula 20 and Cronbach Alpha coefficient respectively. Four research questions and four research hypotheses were formulated to guide the study. The research questions were answered using mean and standard deviation while the hypotheses were tested at 5% level of significance using the Analysis of Covariance (ANCOVA) and independent samples t-test. The study revealed that both male and female students in experimental group achieved the same and also showed similar interest in mathematics.

Ezeh (2012) worked on the effects of advance organizers on student achievement, interest and retention in Integrated Science. The students were grouped into low and high ability levels. The result after analyzing

with 2 x 2 analysis of co- variance indicated that there is no significant difference between the low and high ability groupings with regards to their interest level but there is a significant difference between the high and low ability levels with regards to their levels of performance, with the high ability groups performing better.

Ozofor (2013), carried out a study on the effect of Target task on students' achievement in probability. A total of two hundred and forty (240) SS111 students were involved. The study was carried out in Udi Local Government Area of Enugu State. The design was quasi-experimental. His findings among other things indicated that, target task approach was more effective than the talk-chalk approach in teaching conditional probability. There was no significant difference between the mean performance of male and female students exposed to the target task.

Smith (nd) worked on a comparative evaluation of three teaching methods: the Socratic dialogue method, the lecture method, and the personalized system of instruction (PSI). The class structures for the three methods were 22 students, 24 students and 21 students in that order. The instrument used for the study was a pre and post-test assessment and a questionnaire that elicited response on the students' reaction and attitudes towards the three methods, administered at the end of the post-test. The result showed that PSI was viewed more positively by the students. The subjects treated with the PSI produced a higher performance rating over the other two methods. The result of the research just showed a higher rating of the PSI over the other two methods together and no details of the other two methods were given.

Ezeugo and Agwuagah (2010) studied the effect of concept mapping on students' achievement in Algebra. The purpose was to determine the differential effect of concept mapping on the achievement of male and female students' achievement in Algebra. A sample of 387 SSII students formed the subject. Data were collected using the Algebra Achievement Test (AAT). Concept maps on quadratic equations and inequalities were drawn and used for the treatment group while conventional approach was used for the control group. Their findings indicated that students exposed to concept mapping technique achieved significantly higher than students who were not exposed to the technique. More so that male students performed better than females on the concept mapping technique.

16.23 Summary of Reviews

Evidence of poor achievement in Mathematics, perhaps as a result of lack of the appropriate strategies for enhancing achievement abounds. This is very eminent in Mathematics as a foundational course for subsequent studies in STEM related courses. This necessitates the exploration of techniques and strategies of attaining meaningful Learning of Mathematics using an Artificially Intelligent Tutoring System (AITS).

Review was also made on the lecture and personalized methods of instruction, each of which has its merits and demerits. It is obvious that no method is considered appropriate for all teaching situations and for all Mathematics concepts, but methods that encourage the active participation of the learner in the teaching – learning process are often preferred to others. Personalized Learning and use of CAI is one of such methods.

Generally, the previous researches on personalized methods using CAI mode of instruction so far reviewed have established the efficacy of personalized method of instruction on various subjects. Smith (nd) and some authors found the personalized instruction and use of CAI more effective.

The literatures reviewed so far, investigated the effectiveness of personalized method and use of Computer Aided Instruction (like Geogebra, ICAN, NOVANET etc.) and nothing specifically on the use of an Intelligent Tutoring System. These gaps in knowledge have necessitated the present study which has not only specified the type of personalized method employed (that is ITS), but will also sought to verify the effect of the Intelligent Tutoring System (referred to as AITS) on students' achievement in Mathematics.

Methodology

Research design

The design for this study was quasi–experimental design. The quasi experimental design is chosen because it controls the internal validity threats of the initial group equivalence and researcher's selection bias, since there was no randomization of the subjects into groups. Specifically, pre-test–post-test of non-equivalent control group design was used. The experimental group learnt using the developed AITS method while the control group was taught using the conventional method. The schematic representation of the design is as shown below;

O_1 X O_2 : AITS
O_3 * O_4 : Traditional Method
Where X = Treatment, O = Observation, * = No treatment.
O_1 and O_3 are the pre-test for experimental and control groups respectively.
O_2 and O_4 are post-test for experimental group and control group respectively.

Population

The population of the study was all the 40 first year undergraduate student in the Faculty of Education and Department of Mathematics Education of the Federal University Lafia and the Nasarawa State University Keffi. The choice for this group is informed by the consideration that it is at this level of studies that critical thinking begin in Nigerian students. The choice of the Federal University Lafia as the Experimental group is informed by the fact that the institution has a fully furnished computer laboratory. The choice of the Nasarawa State University Keffi as control group is to reduce interaction effect by the students and because the curriculum are the same as that of the Federal University.

Sample Size and Sampling Technique

A sample of 40 (20 males and 20 females) students was selected using multistage sampling technique. Multistage sampling technique was used for the study because different sampling techniques would be applied at different stages of the research. This study employed simple random sampling and purposive sampling techniques. Simple random sampling was used in order to avoid bias and to ensure that each undergraduate student had an equal chance of being selected. According to Amin (2015) randomization is effective in creating equivalent representative groups that are essentially the same on all relevant variables thought of by the researcher. Purposive sampling was used in selecting the department of Mathematics Eduaction from the Faculty of Education because dealing with the whole Faculty was too.

Research Instruments

For the purpose of this research work, Mathematics Achievement Test (MAT) was used.
The MAT is a test instrument that covers all the areas of Polynomial that was taught with regard to this study.

Content	Lower Order Questions	Higher Order Questions	Total
Polynomial Identification	5	3	8
Degree of Polynomial and Monomial	4	4	8
Rearranging Polynomials	3	0	3

Multiplication of Polynomial	5	2	7
Addition and Subtraction of Polynomials	3	3	6
Word Problems in Polynomials	1	6	7
TOTAL	21	18	39

Table 1: Table of Specifications for Mathematics Achievement Test (MAT)

Validity and Reliability of Research instruments

MATs were subjected to both face and content validations; For face validation, the instrument was given to three experts, one in Measurement and Evaluation, another in Mathematics Education and yet another in Mathematical Sciences, all from the University of Agriculture Makurdi. The instrument was validated in terms of clarity of the questions asked, proper wording of the items, appropriateness and adequacy of the question/items to the student's level of understanding and experience and agreement of items with the Test Blue Print.

Consequently, the validators made some comments which formed the basis for either modifying or rejecting some of the items. After the validation, the instrument was overhauled completely to reflect the validator's contributions.

To ensure the content validity, Test Blue Print was developed by the researcher. The Test Blue Print was used to determine the number of items to be generated from a particular subunit. To do this, the researcher took into consideration the relative scope of the subunits. Thus subunits that are large in scope attracted more questions than those ones that are relatively small in scope in all, a total of 20 multiple choice questions were generated from the subunits.

Reliability of Research Instruments

Reliability of the instruments was obtained by using the test- retest reliability. Fraenkel and Wallen (2016) argue that for most educational research, stability of scores over a period of two months is usually viewed as sufficient evidence of test- retest reliability. Therefore the researcher pre-tested and retested the instruments on a small number of undergraduate students in an interval of two months. The researcher computed the reliability for multi-item opinion questions using SPSS computer software. The pre-MAT and post-MAT were tested using Kuder-Richardson formula 20 and it gave a reliability figure of 0.79 and 0.73 respectively, which is above the recommended reliability of 0.7 (Kaplan and Saccuz, 2013)

Procedure

The researcher administer the instruments with the help of research assistants and collect data for analysis after the students had responded to them. The MAT was collected after the assigned time for the achievement test elapsed.

The researcher trained 2 research assistants for 3 days in the selected school. The research assistants was informed of the objectives of the study, those for experimental group was introduced to the AITS package and thereafter, AITS software was installed on the computers of the experimental school. Then, a pre-MAT was administered to both the experimental and control groups within the same period. Teaching will commence after the scripts are returned. There were 20 students for the experimental group and 20 students for the control group and the experimental group was from the Federal university Lafia while the control group was from Nasarawa State University Keffi. This was done to avoid interaction effect between the subjects in the experimental and control groups.

The teaching and administration of MAT lasted for one week. At the end of the treatment period, the Post-MAT was administered to the subjects.

The scores for both the experimental and control group were recorded accordingly. The test items in both the pre-MAT and post-MAT test were scored two mark each. The maximum mark was twenty (40) while the lowest mark was zero (0).

Data Analysis

Data collated was analyzed using descriptive statistics of mean and standard deviation to answer the research questions asked while the hypotheses was tested at 0.05 significance level using the analysis of covariance (ANCOVA). The choice of ANCOVA is to control differences across the groups, to increase the precision of data and to remove bias which results from using intact groups.

Design and Development System

Architecture of the Artificially Intelligent Tutoring System
The AITS architectures is show in the following figure (As in Figure 5)

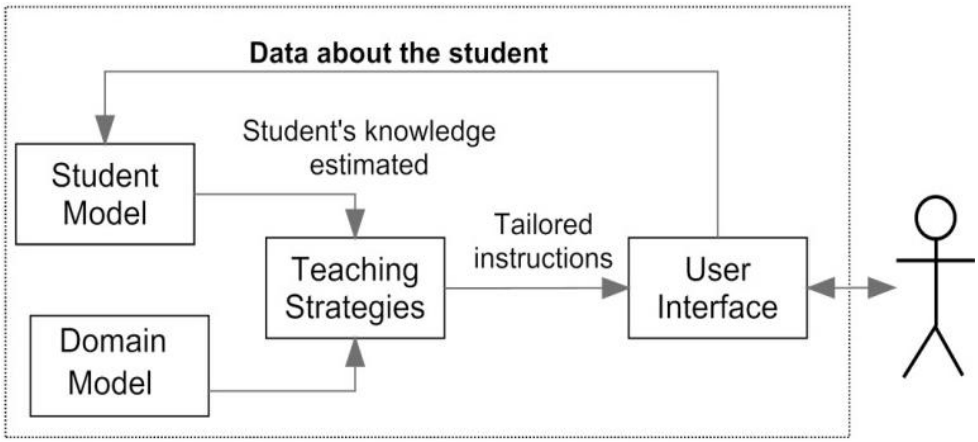


Figure 5: Architectural design of the AITS

Domain Module

This course covers algebraic topics on polynomials; specifically definition, identification, addition, subtraction and multiplication of polynomials. The course curriculum aligns to content that is common to most secondary school algebra topics as well as undergraduate algebra topic. Content is taught through interactive video lectures that include guided practice problems and the associated live action solution and also text-based lectures.

Student Module

In the AITS a new student account must be created to have a profile where it allows the student to study course materials and answer the exercises. The profile has information about the student such as student name and email address.

Teaching Module

Teaching module in the current AITS works as a virtual assistant that manages the student learning throughout this module; it controls the teaching strategies, adapt to student level of knowledge and reviews lessons according to the student ability within each lesson.

For example: a student who passes a test is taken to the net level of the course whereas the AITS system force the student who fails in a test to go back and study the related lesson then come back to answer the exercises of that level.

User interface Module

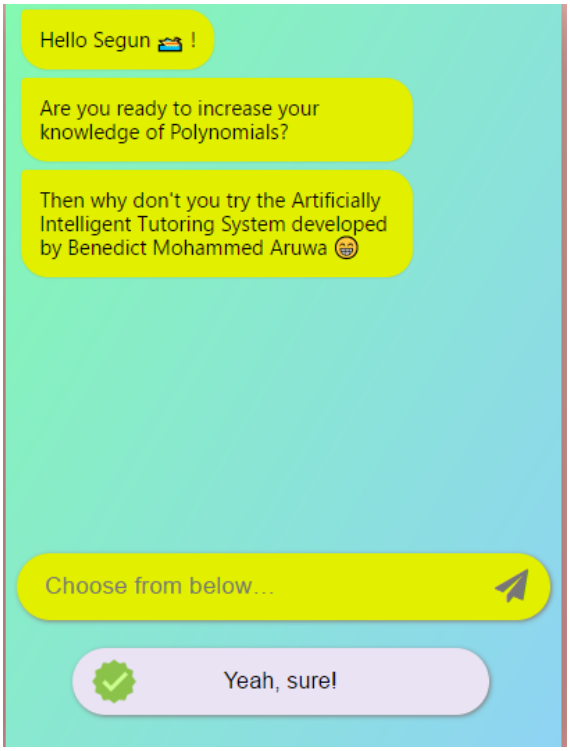
The TARS tool used for building the current AITS system has an interface that supports two classes of users: teachers (admin) and students. When the teacher's log into the system, the teacher can add/modify lessons, exercises and answers. Therefore, this interface provides the system with the required heftiness and suppleness.

Sample Learner Interaction with AITS

A learner, say, Segun, wants to learn about polynomial by interacting with AITS. To start the interaction, AITS greets Segun and asks for his readiness to learn (Plate 2). Then, the AITS proceeds to checking if the learner has a prior knowledge of polynomial by asking a question to know if the learner can differentiate between a polynomic expression and a non-polynomic expression. Segun gives a wrong answer and AITS responds positively by giving a funny emoticon with the 'That's incorrect' (Plate 3). Since it's just to check the previous knowledge the AITS still took Segun to the next step of instruction.

It took Segn through a text-based lecture and asked segun if he understood the lecture (plate 4), if segun says he doesn't understand, AITS will try to determine his challenge by changing the way the instruction was presented (plate 5), it then present the instruction such that the writing style of the mathematical expressions are clearer (Plate 6). After the presentation AITS would proceed to asking Segun if he has understood the instruction, if Segun insist on not understanding, the AITS proceeds to offering Segun an option of a Video Class (Plate 7). Until Segun agrees to understand the lecture, AITS would not procced to giving Segun a test, once understanding is established, the AITS then tries to establish if Segun truly understand the lecture by giving him a test (Plate 8).

Once Segun answers the test question correctly, he proceeds to lesson 2 but if he fails, AITS would repeat and make Segun repeat the test but in a different way and if failure persist he would be asked politely to repeat the lecture. If he achieves success at first attempt, he is immediately moved to lesson 2



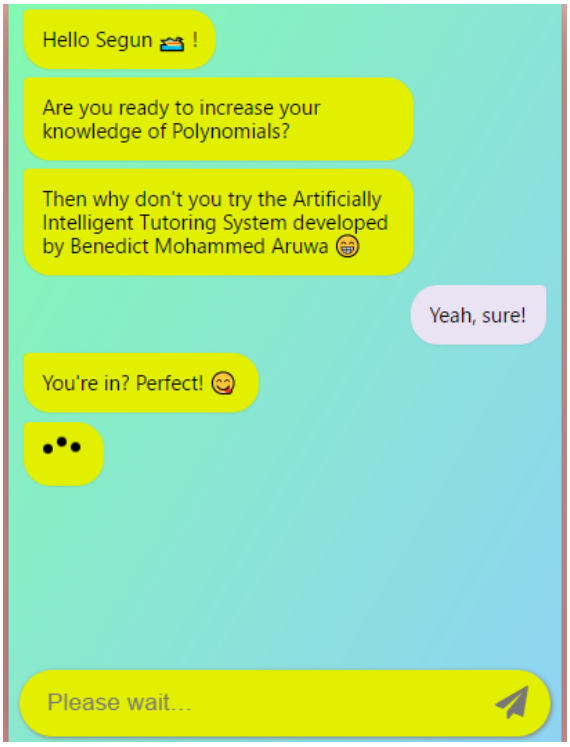
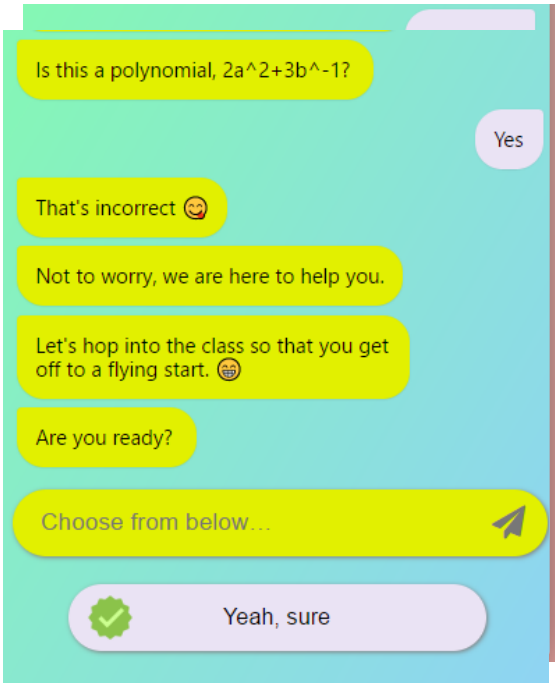


Plate 2: Welcome note and Learners Readiness

Plate 3: Review of learner's previous knowledge



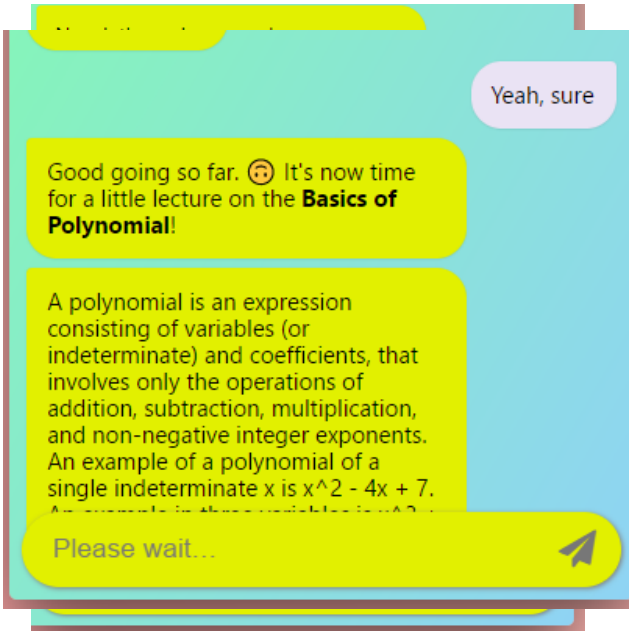


Plate 4: Beginning of text-based lecture

Plate 5: Ascertaining of learners understanding to determine learner's challenges

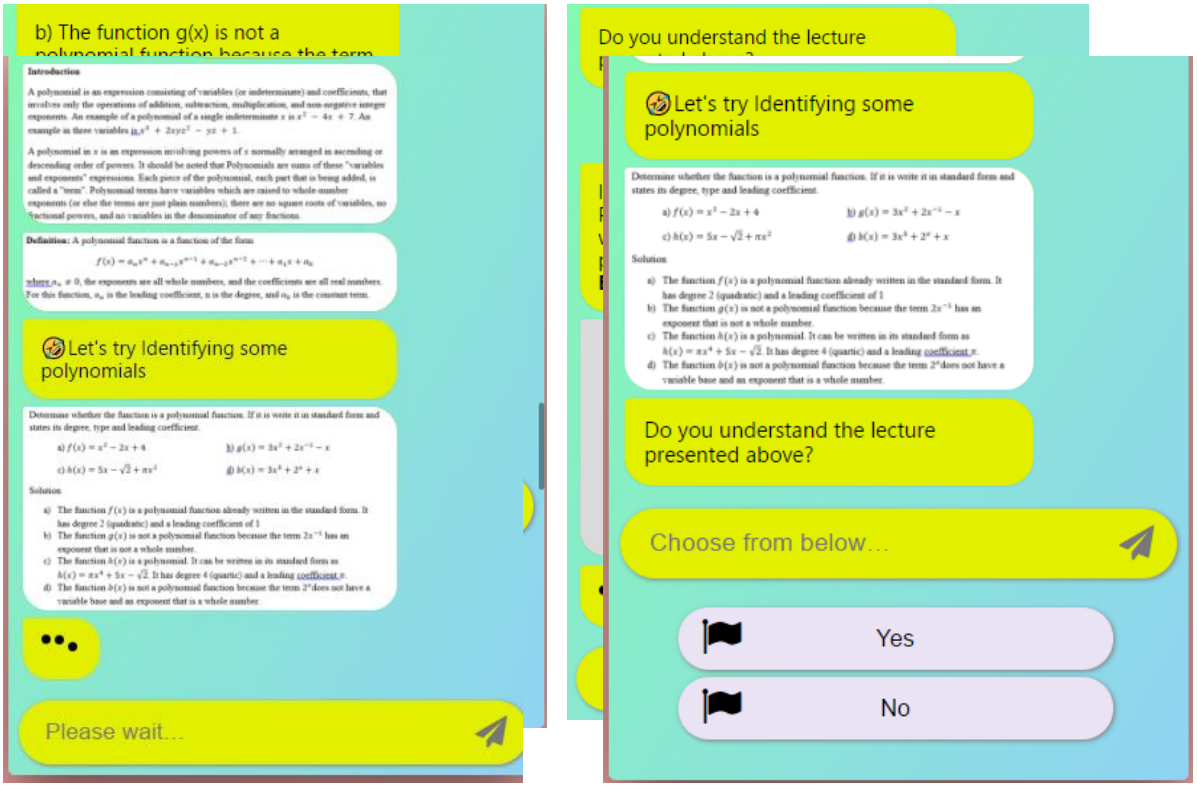
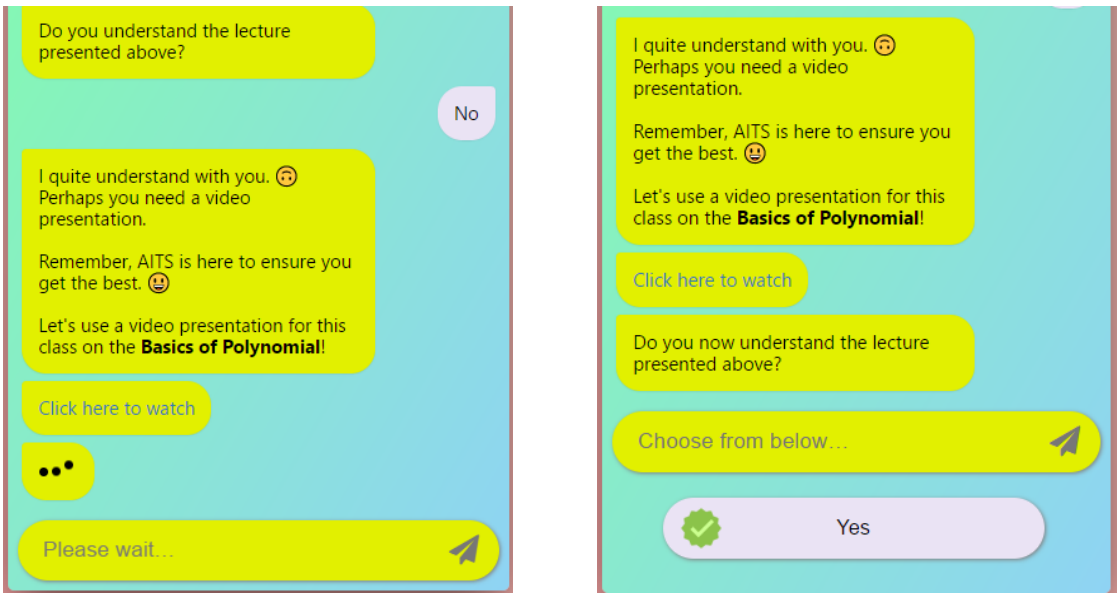
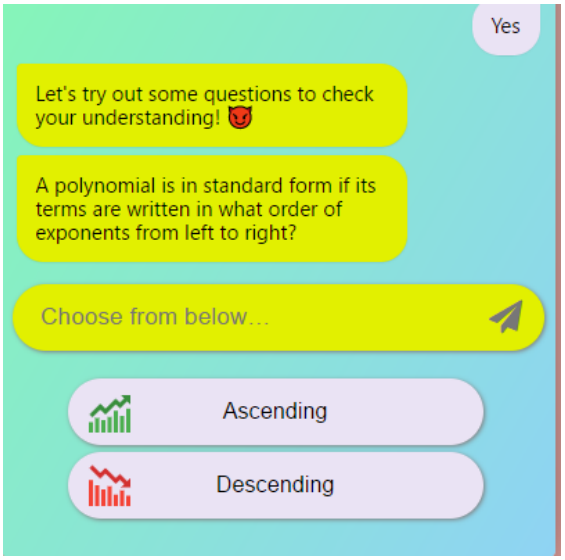


Plate 6: Presenting the lecture such that the Mathematical expressions are clearer

Plate 7: Presenting Video-mode to aid learner





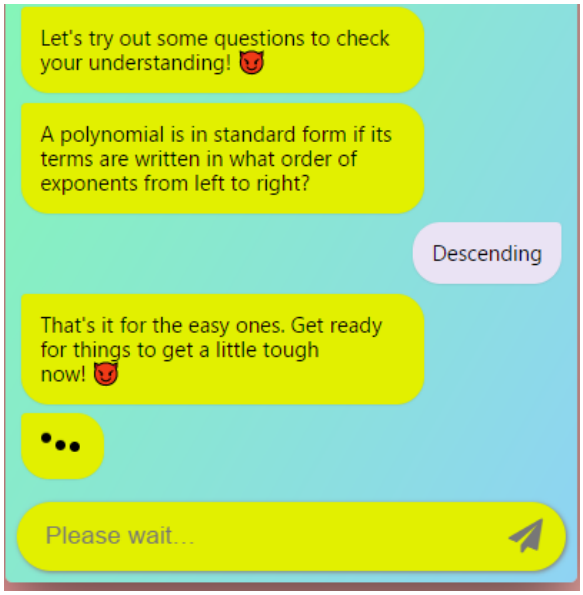
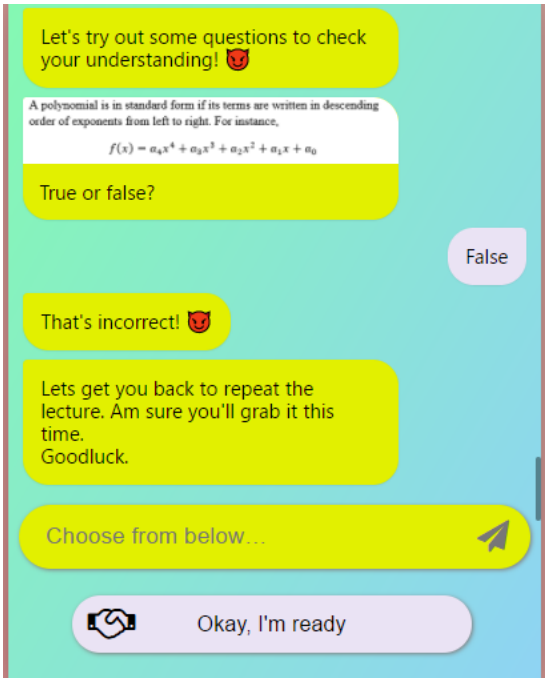
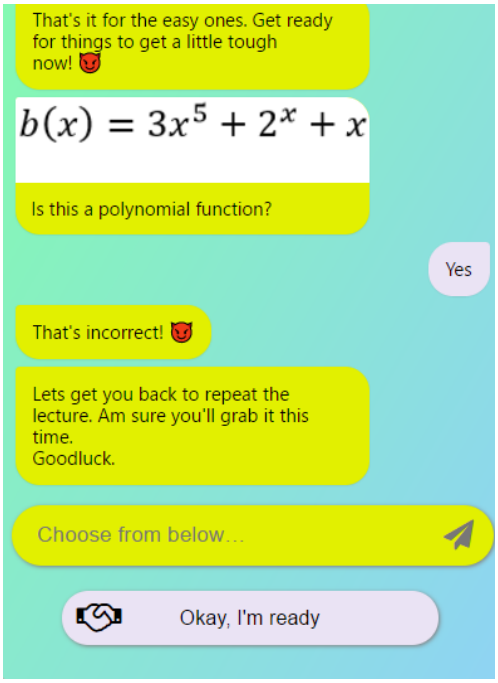


Plate 8: Testing understanding of concept

Plate 9: Repeated failure lead to Repeating of teaching session





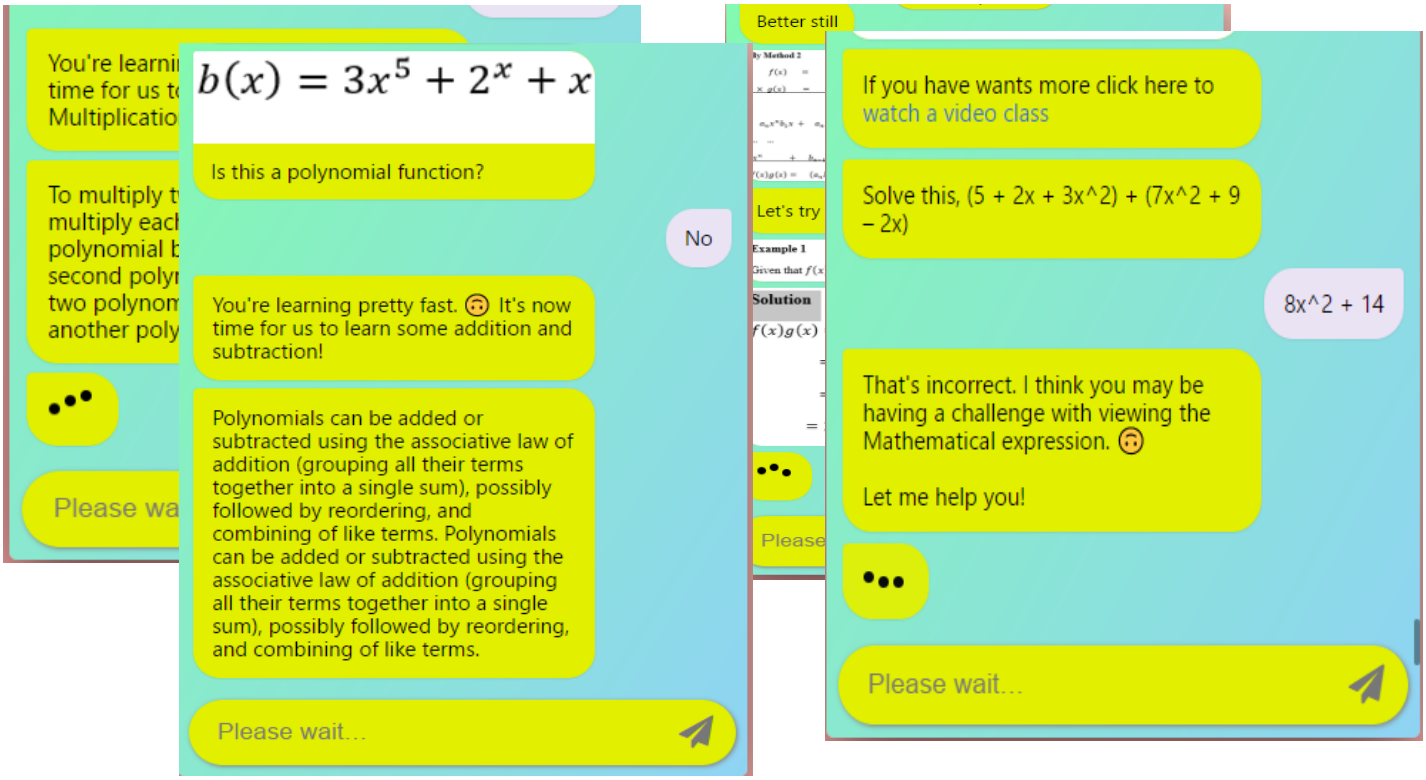


Plate 10: Success in exercise led to progression to next instruction

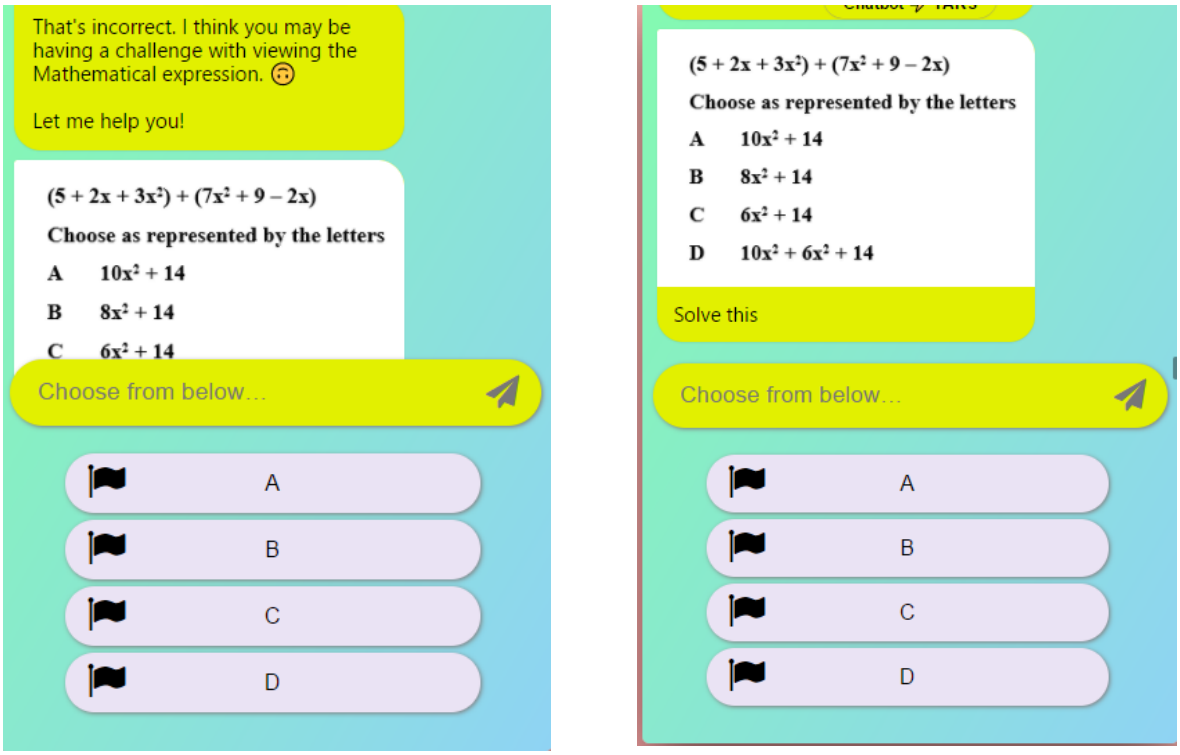


Plate 11: Assistance with exercise due to failure in previous exercise

Plate 12: Success in exercise led to progression to next instruction ie Lesson 3

Plate 13: Exercise for lesson 3 with instant feedback

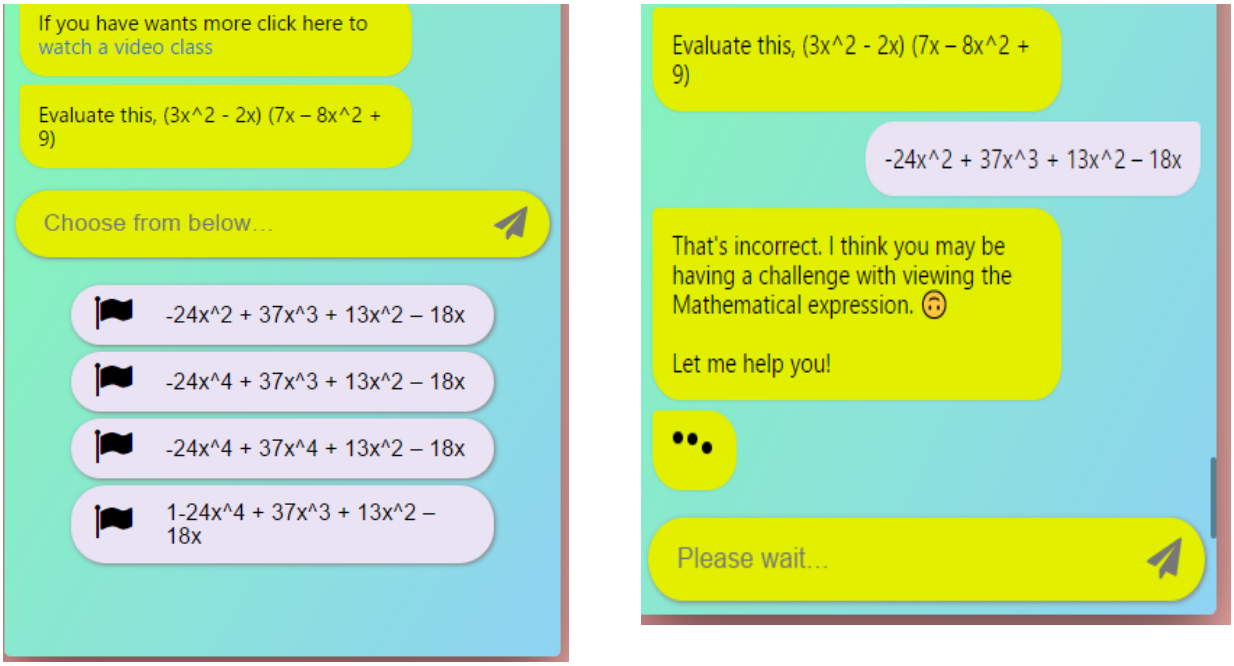


Plate 14: Assistance with exercise due to failure in previous test for lesson 3

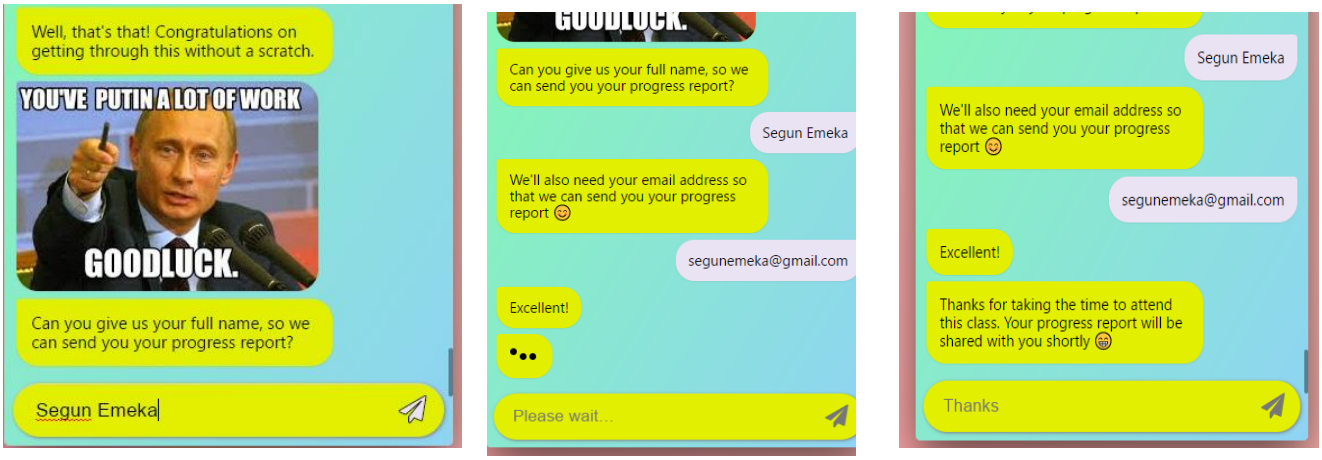


Plate 15: Closing remarks and progress report

AITS Front-End Chat

The front end of AITS is a text chat window between AITS and the student (Plate 1 through 14). Students type or select available options as a response to AITS to give answers to problems. Students can freely scroll through the chat history to review explanations or questions.

AITS Back-End Conversation Graph

The AITS back end consists of a conversation graph that specifies a set of if-then rules for how learner input (e.g., Yeah, sure!) leads to AITS's next action (e.g., give a new problem or provide feedback). In this rule-based system, the state of the conversation is represented as a finite state machine (FSM). In this FSM, each state is a response provided by AITS, and user responses route the user along different paths

in the conversation graph. For example, the question asked is a state, and responses to that question route users to a new state (Plate 8).

The graph showing how responses are treated and feedback given is shown in Plate 16 below.

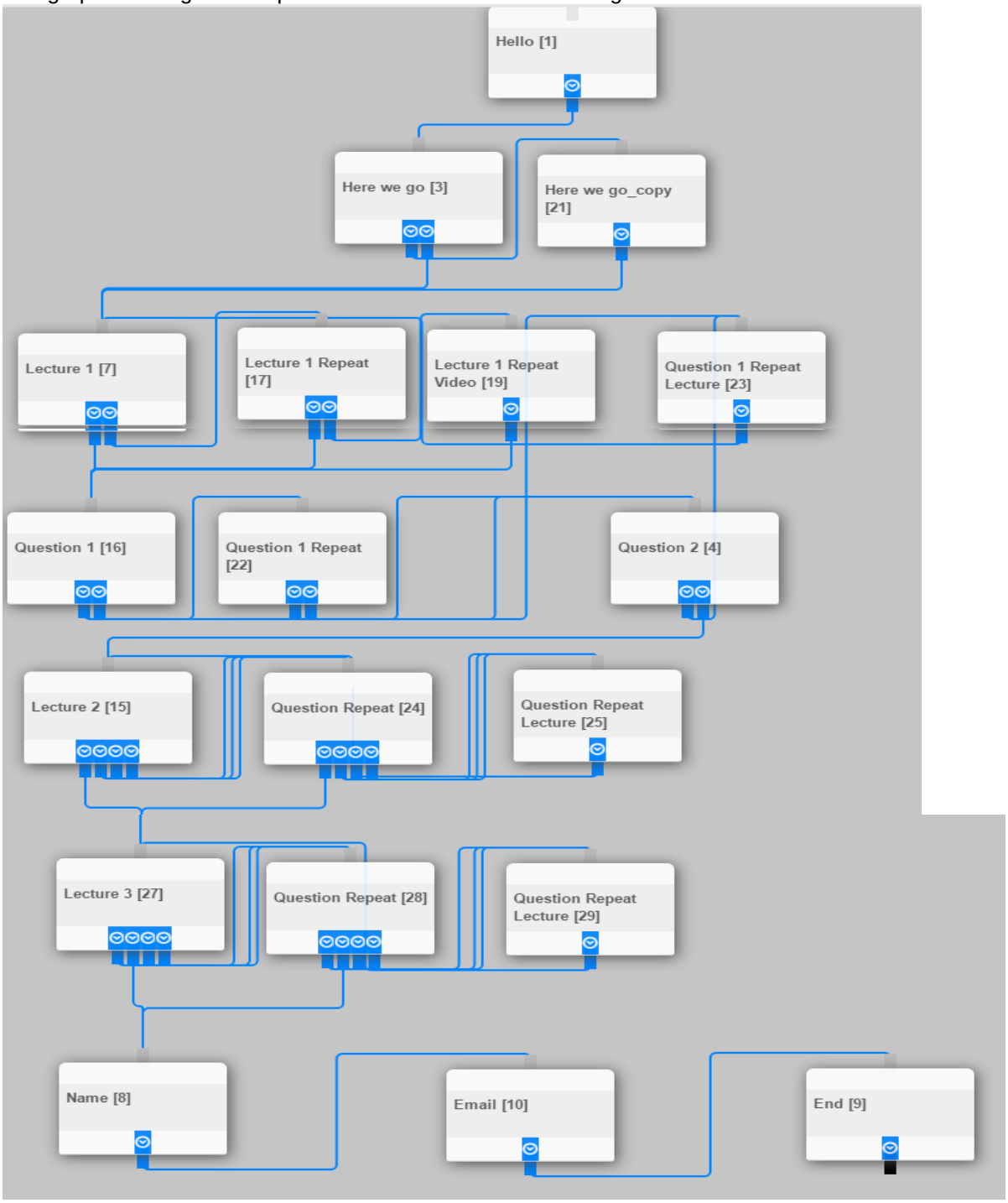


Plate 16: AITS Conversation Graph

Goals of the Artificially Intelligent Tutoring System AITS

Goal 1: Checking Understanding

The first goal of AITS is to use conversational questions to continually check users' understanding while they are learning. This is often not possible while learners are listening to explanations from a video, as they may realize they misunderstand a concept only after they begin to solve problems. AITS therefore asks learners to solve problems after providing text and image explanations of concepts. When a user answers incorrectly, AITS's conversation graph help the learner by rewriting the question in a clearer format. This allows AITS to embed the benefits of practicing problems within the same conversational context as direct instruction and explanation of concepts.

Goal 2: Personalized Feedback

AITS aims to provide specific feedback dependent on the user's answer to a question and the number of times a user has attempted a particular question. All incorrect answers receives specific feedback, such answer specific feedback while solving problems has been shown to be effective for learning and such "tailored feedback" on problems is geared towards enhancing learners understanding.

Goal 3: Guiding Learners' Review of Concepts

AITS aims to guide learners' study activities by progressing through conceptual explanations and corresponding problems while allowing appropriate review of concepts that learners failed to grasp. AITS achieves this by encoding progressions from lesson to lesson, as well as rules that indicate when inaccuracy on certain problems suggests the need for review of certain prerequisite concepts. Based on detection of whether a learner understands a prerequisite concept, AITS may push the learner back to an earlier line of conversation and problem- solving for reviewing. This enables tailored pathways for each student.

.

Goal 4: Interaction with a Supportive Agent

AITS aims to give students the experience that they are interacting with a supportive agent, versus just solving problems or watching videos alone. The goal is to create a casual conversational experience analogous to communicating with a human tutor via text-chat, even without the benefit of NLP algorithms designed to handle the full range of language a student might use with a tutor.

AITS therefore turns actions one can take with an online problem (e.g., clicking 'Okay! I'm ready' to repeat a previous lesson) into questions that give the impression of conversation. For example, to mimic the effect a 'Okay! I'm ready' button, AITS may say something like "Let get you back to repeat the lecture!" after sending a series of messages. These prompts give users a chance to pause and reflect until they are ready to move on.

AITS also employs a friendly tone, provides supportive cues such as transition phrases and emoji, and exhibits natural typing patterns. Correct and incorrect feedback to answers provided by AITS users often incorporates icons or emoji that might be used in an SMS text or messaging program (e.g., "That's correct!").

Data Analysis and Interpretation

This chapter presents the following: Statistical analysis of data collected, sequential presentation of results as well as relevant interpretations based on the research questions and the tested hypotheses.

Result from Research Question

Research Question 1

What are the mean achievement scores of students who were taught with AITS as tutor and those who were taught with the traditional method?

Table 2: Mean Achievement Scores and Standard Deviation of Students who were taught with AITS and without AITS (traditional method)

Group		Pretest	posttest	Mean gain
AITS Group	N	20	20	
	Mean	17.15	36.20	19.05
	Std. Deviation	2.16	4.92	
Control	N	20	20	
	Mean	16.35	27.50	11.15
	Std. Deviation	2.54	6.79	

Table 2 shows the mean achievement score of students who were taught with AITS as tutor and tool and those who were taught without AITS (traditional method). Students who were taught with AITS as tutor had a mean of 36.20 in the posttest and standard deviation of 4.92 while students who were taught without AITS (traditional method) had a mean of 27.50 and standard deviation of 6.79. The mean achievement scores of students taught with AITS as tutor were higher than the mean achievement score of students taught without AITS (traditional method). For the pre-test, the mean achievement scores of students taught with AITS as tutor and control were respectively 17.15 and 16.35. This indicates that the students were at the same level before the experiment.

Research Question 2

What are the mean achievement scores of male and female students who were taught with AITS as tutor?
Table 3: Mean Achievement Scores and standard Deviation of male and female students who were taught with AITS

Group	Sex		Pretest	Posttest
AITS Group	Male	N	10	10
		Mean	17.20	36.40
		Std. Deviation	2.53	4.85
	Female	N	10	10
		Mean	17.10	36.00
		Std. Deviation	1.85	5.21
	Total	N	20	20
		Mean	17.15	36.20
		Std. Deviation	2.16	4.92

Table 3 shows the mean achievement scores and standard deviation of male and female students who were taught with AITS as tutor and also those that were taught without AITS (traditional method). For AITS Group, male students had a mean of 36.40 with standard deviation of 4.85 while female students had a mean of 36.00 with standard deviation of 5.21 in the posttest. This indicated that no significant difference is noticed in the achievement male and female students taught with AITS as tutor.

Research Question 3

Does the AITS cater for both academically higher-level learners and lower-level learners?
Table 4: Mean Achievement score of academically higher-level learners and lower-level learners

Group		Pretest	posttest
High Learn	N	7	7
	Mean	19.00	37.86
	Std. Deviation	1.00	3.39
Low Learn	N	13	13
	Mean	16.15	35.31
	Std. Deviation	1.95	5.48

Table 4 revealed that the academically higher-level students who were taught with AITS as tutor had a pretest score of 19.00 and standard deviation of 1.00; posttest score of 37.86 and standard deviation of 3.39 respectively while the academically lower-level students who were taught with AITS as tutor had a pretest score of 16.15 and standard deviation of 1.95; posttest score of 35.31 and standard deviation of 5.48 respectively. This result indicated that AITS cater for both academically higher-level learners and lower-level learners.

Result from Research Hypothesis

Research Hypothesis 1
There is no significant difference between the mean achievement scores of students who were taught with AITS and those who were taught without AITS (traditional method).

Table 5: ANCOVA Table of Students' scores in the Mathematics Achievement Test (MAT)

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	770.765[a]	2	385.382	10.800	.000	.369
Intercept	964.728	1	964.728	27.035	.000	.422
PreMAT	13.865	1	13.865	.389	.537	.010
Group	769.660	1	769.660	21.568	.000	.368
Error	1320.335	37	35.685			
Total	42668.000	40				
Corrected Total	2091.100	39				

a. R Squared = .369 (Adjusted R Squared = .334)

Table 5 indicated that the use of AITS in teaching Polynomials is a significant factor in the mean achievement scores of students who were taught with AITS and without AITS (traditional method). This is because with the 95% confidence interval of difference, the value of F, its degree of freedom and its P-

value is significant, the value of F is 21.568, and the result of the test is significant beyond the .05 level of significant as .000 is less than 0.05. Therefore the null hypothesis of no significant difference is hereby rejected. This means that there is a significant difference in the mean achievement scores of students taught with AITS and those taught without AITS (traditional method).

Hypothesis 2

There is no significant difference between the mean achievement scores of male and female students' who were taught with AITS and those taught with traditional teaching method

Table 6: ANCOVA table of students who were taught with AITS as tutor and without AITS on achievement with respect to Gender

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	12.226[a]	2	6.113	.233	.795	.027
Intercept	531.974	1	531.974	20.233	.000	.543
PreMAT	11.426	1	11.426	.435	.519	.025
Gender	.950	1	.950	.036	.852	.002
Error	446.974	17	26.293			
Total	26668.000	20				
Corrected Total	459.200	19				

a. R Squared = .027 (Adjusted R Squared = -.088)

Table 6 indicated that the across gender there is no significant difference in the treatment and therefore using AITS, gender is not a significant factor in the mean achievement scores of students in the Mathematics Achievement Test. This is because with the 95% confidence interval of difference, the value of f, its degree of freedom and its P-value significant, the value of F is 0.036 and the result of the f-test is non-significant beyond the 0.05 level of significant as .852 is greater than 0.05. This hypothesis of no significant difference in the mean achievement scores is therefore accepted. This means that there is no significant difference in the mean achievement scores of male and female students taught with AITS as tutor. This therefore implies that AITS for teaching Mathematics can reduce gender gap in achievement of students.

Hypothesis 3

There is no significant difference on the effect of AITS on academically higher-level learners and lower-level learners

Table 7: ANCOVA Table of Students who academically higher learners and lower learners

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	110.343[a]	2	55.171	2.689	.097	.240
Intercept	568.424	1	568.424	27.700	.000	.620
PreMAT	80.769	1	80.769	3.936	.064	.188
Learners	99.066	1	99.066	4.828	.042	.221
Error	348.857	17	20.521			
Total	26668.000	20				
Corrected Total	459.200	19				

a. R Squared = .240 (Adjusted R Squared = .151)

Table 7 shows that there is no significant difference between the scores of the academically higher learners and the academically lower students who were taught with AITS as tutor. This is because with the 95% confidence interval of difference, the value of F, its degree of freedom and its P- value significant, the value

of F is 4.828, and the result of F test is significant beyond the 0.05 level as .097 (as in corrected model) is greater than .05. Therefore hypothesis of no significant difference is accepted. The result indicated that both academically higher learners and lower learners gained significantly meaning that the AITS cater for both kind of learners.

Discussion of Findings

Based on the results of the analysis of data presented in this chapter, the following major findings came up. The discussion is presented under the following captions:
Effect of AITS on students' achievement
Effect of AITS on gender
Effect of AITS on Type of leaners

Effect of AITS on students' achievement

Results presented on Table 2 and Table 5 showed that students taught with AITS performed significantly better in the Mathematics Achievement Test than their counterparts who were taught using the traditional method. This result is in agreement with the result of earlier studies carried out by Gambari et al (2014), John (2019) and Ozofor (2011), who found in their separate studies, that the use of computer software was more effective than the traditional methods in enhancing students' achievement. The relative superiority of the AITS over the lecture method in enhancing students' achievement in Mathematics could be attributed to the fact that, it is student – centered and ensures active participation of students in the teaching learning process more than the lecture method. The lecture method often subjects the learner to the position of the passive recipient of the facts as handed down to him by the teacher. Moreover, the activities in the AITS were carried out by the students themselves, at their own pace during and after the school periods; which is in contrast to the lecture method where the teacher did most of the work for the students. The active participation of the students involving the use of several sense organs, invariably should arouse greater students' interest going by psychological theories (Blair and Stone, 2015). Given, these prevailing circumstances under which the AITS and the lecture method are employed in the classroom instruction, it is not surprising that the treatment group (AITS) out – performed the control group in the MAT. The above result on the effect of AITS on achievement of students, does not, however, agree completely with Michael (2012) who found that the use of CAI in teaching of Mathematics did not show any significant difference when compared to the traditional lecturing method.

Effect of AITS on Gender

Results from Table 3 and Table 6 showed that there is no significant difference in the achievement of male and female students taught using the AITS. Although, the result from the Table 3 showed that the mean achievement of the male was slightly higher than the females. The result is in agreement with the finds of Gambari et al (2014), Etukudo (2012), Aruwa (2015), Ezeugo and Agwuagah (2011) and Ozofor (2013) who discovered in their independent studies that there is no significant difference between the achievement of boys and that of girls, in Mathematics using different instructional strategies. This could be attributed to the fact that the activities in the AITS are carried out by the students themselves and at their own pace during and after the school period, so this has given both the male and female students' chances of performing equally. On the other hand, the mean achievements score of male students being slightly better than their female counterparts can be associated with social attachment that males are more mathematically incline than female. Nevertheless, the finding of this study disagrees with the findings of Nnadi (2011), Erinsho (2005) and Ugwu (2017), who found significant difference in achievement in their independent studies.

Effect of AITS on Type of Learner

Results from Table 4 and Table 7 showed that the AITS caters for both the academically higher and leaners. Although, from Table 4 the mean achievement score for the higher learners were significantly higher than that of the lower learners, nevertheless there was significant improvement in the achievement scores of both type of learners. It is expected that as a result of the combination of genetic and environmental factors,

the academically higher students are cognitively ready for learning than the academically lower students. Perhaps, this situation arises because of the fact that higher students requires less effort and time to process and learn a given task than their lower counterparts. In addition the AITS, because it facilitate individuality in learning, the higher learner group may prefer working and learning on their own and moving at his own pace. This may account for the significant higher achievement of the academically higher students than their academically lower counterparts. The result of this study is in consonance with that of Ezeh (2012) whose findings indicated that there is no significant difference between the low and high ability groupings with regards to their interest level but there is a significant difference between the high and low ability levels with regards to their levels of performance, with the high ability groups performing better.

Summary of Findings

This study was on the effectiveness of personalized learning using an Artificially Intelligent Tutoring System (AITS) as the tutor in teaching and learning of Polynomials.

Results showed that students who were taught with AITS as tutor outperformed those who were taught using the traditional method. It equally revealed that students that both the academically higher and academically lower learners improved significantly after interaction with the AITS. The result also showed that the male and female students achievement were not statistically significant after exposure to the AITS.

Conclusion

The following conclusions are made based on the findings of this study. The results of this study provided the empirical evidence that the use of an Intelligent Tutoring System as a tutor enhanced students' achievement in polynomial than the traditional lecturing method of delivering instruction.

Secondly, there was no significant difference between the mean achievement male and female students that were taught with AITS as tutor. Thus the computer did not recognize whether a male or a female student was using it. This implies that gender has no significant effect on achievement. Also, the use of AITS reduces gender gap.
Finally, the AITS software was seen to enhance the achievement of both the academically higher and lower learners. This means that the use of ITS in education caters for all kinds of learners.

In general, the use of an Intelligent Tutoring System (ITS) has proved to be viable in enhancing the meaningful teaching and learning of polynomials.

Implication of the Study

The results of this study have some obvious implications to the teacher in the sense that the teacher will now know that using educational technologies especially the computer to augment his teaching is better in enhancing student achievement. Teachers should therefore apply this knowledge from the findings of this work in their teachings especially now that computers are relatively available in schools. Teachers should equally try to be computer literate, so that they will be able to make use of the computer in teaching.

Since the efficacy of the use of ICT infrastructure and computer programs as a tool has been indicated in this study, States and Federal Ministries of Education should organize seminars and workshops where teachers, textbook authors and curriculum planners will be taught the various ways of using computer for effective teaching and learning of quadratic equation. There should be training of students to enable them to be computer literate so as to fit in, in this society of technological advancement.

The results of this study also calls for a critical review of the secondary school mathematics curriculum with the aim of including computer learning and increasing the time for class lessons so as to accommodate the use of computers in learning. It could also provide an alternative instructional method that could be employed by teachers to enhance gender equity in mathematics achievement. Furthermore, other researchers will use these findings for further studies by using it as a reference point.

Recommendations

The following recommendations were made based on the findings of this study:

1. Since the use of computer as a tool enhances achievement in mathematics, the mathematics teacher should use it as one of the strategies to be employed in classroom.
2. Workshops / Seminars should be organized by the Government for Mathematics teachers to enable teachers learn how to use AITS module and other software in teaching Mathematics.
3. Computers should be made available in schools, by the Government so that every student will have access to computers and make use of them in learning.
4. Parents should equally be encouraged to buy computers for students to use at home after normal classes. This will help students to practice what they have learnt in school and equally discourage them from engaging in unnecessary ventures after school.
5. Programmers and software producers should be encouraged to use mathematics curriculum in the production of software and equally arrange them according to classes

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APPENDIX A

POLYNOMIAL LECTURE NOTE

Introduction

A polynomial is an expression consisting of variables (or indeterminate) and coefficients, that involves only the operations of addition, subtraction, multiplication, and non-negative integer exponents. An example of a polynomial of a single indeterminate x is $x^2 - 4x + 7$. An example in three variables is $x^3 + 2xyz^2 - yz + 1$.

A polynomial in x is an expression involving powers of x normally arranged in ascending or descending order of powers. It should be noted that Polynomials are sums of these "variables and exponents" expressions. Each piece of the polynomial, each part that is being added, is called a "term". Polynomial terms have variables which are raised to whole-number exponents (or else the terms are just plain numbers); there are no square roots of variables, no fractional powers, and no variables in the denominator of any fractions.

Definition: A polynomial function is a function of the form

$$f(x) = a_n x^n + a_{n-1}x^{n-1} + a_{n-2}x^{n-2} + \cdots + a_1 x + a_0$$

where $a_n \neq 0$, the exponents are all whole numbers, and the coefficients are all real numbers. For this function, a_n is the leading coefficient, n is the degree, and a_0 is the constant term.

Identification of Polynomials

Example

Determine whether the function is a polynomial function. If it is write it in standard form and states its degree, type and leading coefficient.

a) $f(x) = x^2 - 2x + 4$ b) $g(x) = 3x^2 + 2x^{-1} - x$

c) $h(x) = 5x - \sqrt{2} + \pi x^2$ d) $b(x) = 3x^5 + 2^x + x$

Solution

a) The function $f(x)$ is a polynomial function already written in the standard form. It has degree 2 (quadratic) and a leading coefficient of 1
b) The function $g(x)$ is not a polynomial function because the term $2x^{-1}$ has an exponent that is not a whole number.
c) The function $h(x)$ is a polynomial. It can be written in its standard form as $h(x) = \pi x^4 + 5x - \sqrt{2}$. It has degree 4 (quartic) and a leading coefficientπ.
d) The function $b(x)$ is not a polynomial function because the term 2^xdoes not have a variable base and an exponent that is a whole number.

> A polynomial is in standard form if its terms are written in descending order of exponents from left to right. For instance,
>
> $$f(x) = a_4x^4 + a_3x^3 + a_2x^2 + a_1x + a_0$$

NOTE:

Addition and Subtraction of Polynomials

Polynomials can be added or subtracted using the associative law of addition (grouping all their terms together into a single sum), possibly followed by reordering, and combining of like terms.

Let $f(x) = a_n x^n + a_{n-1}x^{n-1} + \cdots + a_1 x + a_0$ and $g(x) = b_n x^n + b_{n-1}x^{n-1} + \cdots + b_1 x + b_0$

Then,

By Method 1

$f(x) + g(x) = (a_n + b_n)x^n + (a_{n-1} + b_{n-1})x^{n-1} + \cdots + (a_1 + b_1)x + a_0 + b_0$

Similarly,

$f(x) - g(x) = (a_n - b_n)x^n + (a_{n-1} - b_{n-1})x^{n-1} + \cdots + (a_1 - b_1)x + a_0 - b_0$

Better still,

By Method 2

$$\begin{array}{rcccccccc} f(x) & = & a_n x^n & + & a_{n-1}x^{n-1} & + \cdots + & a_1 x & + a_0 \\ \underline{+\ g(x)} & = & \underline{b_n x^n} & + & \underline{b_{n-1}x^{n-1}} & + \cdots + & \underline{b_1 x} & + \underline{b_0} \\ f(x) + g(x) = & & (a_n + b_n)x^n & + & (a_{n-1} + b_{n-1})x^{n-1} & + \cdots + & (a_1 + b_1)x & + a_0 + b_0 \end{array}$$

Similarly,

$$\begin{array}{rcccccccc} f(x) & = & a_n x^n & + & a_{n-1}x^{n-1} & + \cdots + & a_1 x & + a_0 \\ \underline{-\ g(x)} & = & \underline{b_n x^n} & + & \underline{b_{n-1}x^{n-1}} & + \cdots + & \underline{b_1 x} & + \underline{b_0} \\ f(x) - g(x) = & & (a_n - b_n)x^n & + & (a_{n-1} - b_{n-1})x^{n-1} & + \cdots + & (a_1 - b_1)x & + (a_0 + b_0) \end{array}$$

Example

Two polynomials are: $P_1 = 2x^3 - 3x^2 + 5x - 7$ and $P_2 = x^3 + x^2 - x + 1$

Find (a) $P_1 + P_2$ (b) $P_1 - P_2$ (c) $2P_1 - 3P_2$

Solution

(a) $P_1 + P_2 = (2x^3 - 3x^2 + 5x - 7) + (x^3 + x^2 - x + 1)$

$= 2x^3 - 3x^2 + 5x - 7 + x^3 + x^2 - x + 1$

$= 3x^3 - 2x^2 + 4x - 6$

OR

$$\begin{array}{rcccccc} P_1 = & 2x^3 & - 3x^2 & + 5x & - 7 \\ \underline{P_2 =} & \underline{x^3} & \underline{+\ x^2} & \underline{-\ x} & \underline{+ 1} \\ P_1 + P_2 = & 3x^3 & - 2x^2 & + 4x & - 6 \end{array}$$

(b) $P_1 - P_2 = (2x^3 - 3x^2 + 5x - 7) - (x^3 + x^2 - x + 1)$

$$= 2x^3 - 3x^2 + 5x - 7 - x^3 - x^2 + x - 1$$

$$= x^3 - 4x^2 + 6x - 8$$

OR

$$\begin{array}{lrrrr} P_1 = & 2x^3 & -3x^2 & +5x & -7 \\ \underline{P_2 = } & \underline{x^3} & \underline{+\ x^2} & \underline{-\ x} & \underline{+1} \\ P_1 - P_2 = & x^3 & -4x^2 & +6x & -8 \end{array}$$

(c) $2P_1 - 3P_2 = 2(2x^3 - 3x^2 + 5x - 7) - 3(x^3 + x^2 - x + 1)$

$$= 4x^3 - 6x^2 + 10x - 14 - 3x^3 - 3x^2 + 3x - 3$$

$$= x^3 - 9x^2 + 13x - 17$$

OR

$$\begin{array}{lrrrr} 2P_1 = & 4x^3 & -6x^2 & +10x & -14 \\ \underline{3P_2 = } & \underline{3x^3} & \underline{+3x^2} & \underline{-3x} & \underline{+3} \\ 2P_1 - 3P_2 = & x^3 & -9x^2 & +13x & -17 \end{array}$$

Multiplication of Polynomials

To multiply two polynomials, you multiply each term of the first polynomial by each term of the second polynomial. The product of two polynomial of degrees m and n is another polynomial of degree $m + n$.

Let $f(x) = a_n x^n + a_{n-1}x^{n-1} + \cdots + a_1 x + a_0$ and $g(x) = b_n x^n + b_{n-1}x^{n-1} + \cdots + b_1 x + b_0$

Then,

By Method 1

$f(x) \times g(x) = f(x)g(x) = a_n x^n(b_n x^n + b_{n-1}x^{n-1} + \cdots + b_1 x + b_0) + a_n x^n(b_n x^n + b_{n-1}x^{n-1} + \cdots + b_1 x + b_0) + \cdots + a_1 x\,(b_n x^n + b_{n-1}x^{n-1} + \cdots + b_1 x + b_0) + a_0(b_n x^n + b_{n-1}x^{n-1} + \cdots + b_1 x + b_0)$

Better still,

By Method 2

$$\begin{array}{lrrrrr} f(x) & = & a_n x^n + & a_{n-1}x^{n-1} + \cdots & + a_1 x & + a_0 \\ \underline{\times\ g(x)} & \underline{=} & \underline{b_n x^n + } & \underline{b_{n-1}x^{n-1} + \cdots} & \underline{+ b_1 x} & \underline{+ b_0} \\ & & a_n x^n b_0 + & a_{n-1}x^{n-1}b_0 + \cdots & + a_1 x b_0 & + a_0 b_0 \\ & a_n x^n b_1 x + & a_{n-1}x^{n-1}b_1 x & + \cdots + a_1 x b_1 x & & + a_0 b_1 x \\ \cdots & \cdots & & & & \\ \underline{x^n} & \underline{+} & \underline{b_{n-1}x^{n-1}} & \underline{+ \cdots +} & \underline{b_1 x} & \underline{+ b_0} \\ f(x)g(x) = & & (a_n b_n)x^n + & (a_{n-1}b_{n-1})x^{n-1} + \cdots + & (a_1 b_1)x & + (a_0 b_0) \end{array}$$

Example 1

Given that $f(x) = 7x + 5y$ and $g(x) = 4x - 3y$. Find $f(x)g(x)$

Solution

$f(x)g(x) = (7x + 5y)(4x - 3y)$

$= 7x(4x - 3y) + 5y(4x - 3y)$

$= (28x^2 - 21xy) + (20xy - 15y^2)$

$= 28x^2 - 21xy + 20xy - 15y^2$

Therefore,

$f(x)g(x) = 28x^2 - xy - 15y^2$

OR

$$\begin{array}{rr} 7x & +5y \\ \times\ 4x & -3y \\ \hline 28x^2 & +20xy \\ & -21xy - 15y^2 \\ \hline 28x^2 & -xy \quad -15y^2 \end{array}$$

Example 2

Multiply $(2 + 3x)$ and $(6 - 5x + 4x^3 - 3x^2)$

Solution

It is more convenient to arrange them in descending order of powers.

Rearranging the terms gives us $3x + 2$ and $4x^3 - 3x^2 - 5x + 6$

Let $f(x) = 3x + 2$ and $g(x) = 4x^3 - 3x^2 - 5x + 6$. Then, by method 1 we get

$f(x)g(x) = (3x + 2)(4x^3 - 3x^2 - 5x + 6)$

$= 3x(4x^3 - 3x^2 - 5x + 6) + 2(4x^3 - 3x^2 - 5x + 6)$

$= (12x^4 - 9x^3 - 15x^2 + 18x) + (8x^3 - 6x^2 - 10x + 12)$

$= 12x^4 - 9x^3 - 15x^2 + 18x + 8x^3 - 6x^2 - 10x + 12$

Rearranging like terms, we get

$f(x)g(x) = 12x^4 - 9x^3 + 8x^3 - 15x^2 - 6x^2 + 18x - 10x + 12$

$= 12x^4 - x^3 - 21x^2 + 8x + 12$

Therefore,

$f(x)g(x) = 12x^4 - x^3 - 21x^2 + 8x + 12$

OR By Method 2:

$$\begin{array}{rrrr} 4x^3 & -3x^2 & -5x & +6 \end{array}$$

$$\begin{array}{rl} & \times \qquad\qquad 3x \quad +2 \\ \hline & 8x^3 \quad -6x^2 \quad -10x \quad +12 \\ 12x^4 & -9x^3 \quad -15x^2 \quad +18x \\ \hline 12x^4 & -x^3 \quad -21x^2 \quad +8x \quad +12 \end{array}$$

Example

Mia scored (7a + 3b) goals in the first half of the season. She finished the year with (19a – 2b) goals for the season. How many goals did Mia score in the second half of the season?

Solution

$$(19a - 2b) - (7a + 3b)$$

$$= 12a - 5b \ goals$$

Practice Questions

Brain Power Test

1. The cost of a video game can be modeled by the equation $C = 3x + 2$. The number of games sold can be modeled by the equation $N = 8x - 7$. Write a model for the revenue from the sale of the games.
2. A rectangular piece of cardboard is 15 inches longer than it is wide. If 5-inch squares are cut from each corner, and the remaining piece folded up to form a box, the volume of the box is 1250 cubic inches. Find the dimensions of the piece of cardboard.

Problem Set

1. Add the following polynomials

    a. $(7y^4 + 5y - 6) + (4y^4 - 7y + 9)$
    b. $(s^4 + 3s^3 - 4) + (-4s^3 + 5)$
    c. $(-4x^4 + 7x^3 + 5x - 2) + (3x^4 - x + 4)$
    d. $(-v^4 + 8v - 9) + (5v^3 - 6v + 5)$
    e. $(-p + 5) + (7p^4 - 4p + 4)$

2. Subtract the following:
    a. $(4x^4 + 7x + 4) - (x^4 + 3x + 2)$
    b. $(-4m - 9) - 6m + 4)$
    c. $(-5t^4 + 22t^3 + 3) - (5t^4 - t^3 - 7)$
    d. $(8g + 3) - (g^4 + 5g - 7)$
    e. $(6a^7 - a^3 + a) - (8a^7 + a^4 - 3a)$

3. Multiply the following:

    a. $(y - 8)(y + 3)$
    b. $(5b - 3)(3b - 5)$

c. $(20p + 4)(5p + 3)$
d. $(4z + 2)(20z + 5)$
e. $(7c + 4)(6c + 7)$

4. Simplify the following

a. $2c(3c - 2) + 6c(-3c + 1)$
b. $4w^3(w^2 - 2w + 3) + w(3w^4 - w^2)$
c. $5t(6t^4 + 5t - 6) + 9t(3t + 3) - t^3(29t^2 - t + 8)$
d. $y^2(2y^2 - 6y) - 3y(4y^3 - 2y^2)$
e. $5t(6t^4 + 5t - 6) + 9t(3t + 3) - t^3(29t^2 - t + 8)$

PPENDIX B

MATHEMATICS ACHIEVEMENT TEST (MAT) BEFORE VALIDATION

Instruction: 1. Kindly Place your answers in the space provided.
2. You are expected to NOTE the INSTRUCTIONS in each section
3. Do not write your name in full, use only initials (eg. Write Aruwa Benedict Mohammed be as ABM)
4. In the space for grade, put your 1st semester GPA

SECTION A: Personal Details

Name: _____

Grade: _____

SECTION B: POLYNOMIAL IDENTIFICATION

Instruction: Kindly answer only 4 questions.

State whether each expression is a MONOMIAL, BINOMIAL, TRINOMIAL, or NONE.

1. $3xyz^3$ _____ 2. $2a^2 + b^{-3}$ _____

3. $-4g^2h^3 + gh$ _____ 4. $x^2 + 2x - 1$ _____

5. $5b + 7a - 2b$ _____ 6. $\frac{6}{y^2}$ _____

7. $4a^5 - 3a + 2 - 4a$ _____ 8. $4^x + x$ _____

SECTION C: DEGREE OF POLYNOMIALS AND MONOMIALS

<u>Instruction:</u> Kindly answer only 3 questions.

- MONOMIALS: ADD the exponent of all variables.
- POLYNOMIALS: PICK the largest individual degree of all the terms.
- *<u>Hint:</u> Invisible Exponents = 1*

1. $3r^8$ _____ 2. $-2r^2ts^7$ _____ 3. $5x$ _____ 4. $7x^2y^4$_____
5. $x^8 + 5x^{12} – 8x^5 + 10x$ _____ 6. $5y^5 + 7y^3 – 3y^7 + 10y$ _____
7. $9x^2y^3 – 6x^2y + 11x^4y + 4y^3$ _____ 8. $3a^3b^4 – 6ab^4 + 9a^3b + 5b^6$ _____

SECTION D: ARRANGE A POLYNOMIAL INTO SO POWERS OF X DESCENDING ORDER

<u>Instruction:</u> Kindly answer only 2 questions.

1. $5x^5 + 7x^3 – 8 - 3x^8 + 10x$ _____
2. $3x^2y^4 – 6xy + 9x^3y + 5$ _____
3. $7x – 8y^3 + 4x^2y + 3x^7$ _____

SECTION D: MULTIPLICATION WITH POLYNOMIALS

<u>Instruction:</u> Kindly answer only 3 questions.

Simplify using the distributive property method.

1. $-5(4m^2 – 5m – 8)$ _____
2. $2d(d^5 – 7d^3 + 4)$ _____
3. $7rs(4r^2 + 9s^3\ 7rs)$ _____
4. $(2x + 4)(x + 9)$ _____
5. $(4b – 3)(4b + 3)$ _____
6. $(n + 4m)(2n – 3m)$ _____
7. $(4z + 6)(4z + 6)$ _____

SECTION D: ADDITION AND SUBTRACTION OF POLYNOMIALS

<u>Instruction:</u> Kindly answer only 3 questions.

Combine like Terms between different polynomials using the correct operations to find the sum or difference listed below.

1. $(5 + 2x + 3x^2) + (7x^2 + 9 – 2x)$

_____

2. $(7x^3 – 11x + 3x^2) + (2x^2 – 12 + x)$

_____

3. $(-3x^2 + 5xy – 2y^2) - (y^2 + 5xy – 9y)$

_____

4. $(4y^3 + 5y) + (3y^2 – 2y) – (7y^3 – 6y^2 + 8y)$

_____

5. $(4y^3 – 6y + 8y^2)$ - $(-3y^2 – 7 + 2y^3)$

_____

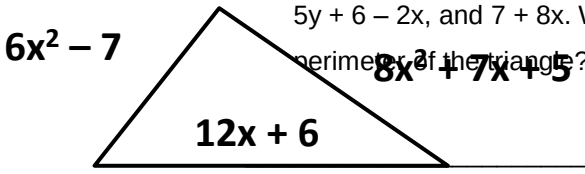
6. $(3r – 5s + 6t) – (5s – 2r) + (11t + 2r)$

_____

SECTION D: WORD PROBLEMS

Instruction: Kindly answer only 3 questions.

1. Find the perimeter of the triangle pictured.

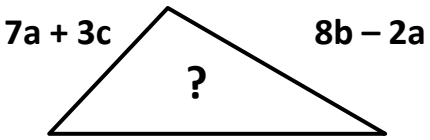


_____

2. A triangle has sides of length 3x + 4y, 5y + 6 – 2x, and 7 + 8x. What is the perimeter of the triangle?

_____

3. Find the missing side for the triangle below with a known perimeter of 12a + 7b + 5c.



_____

4. A triangle has a perimeter $10x^2 – 3xy + 6y^2$. If two sides are known to be $2x^2 + 2xy$ and $7x^2 + 3y^2$, then what is the length of the third unknown side?

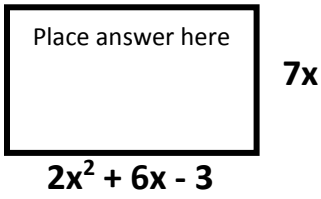
_____

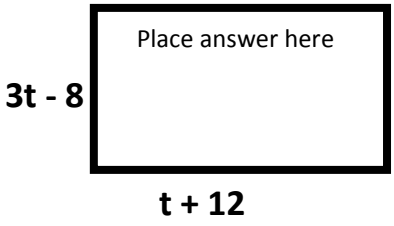
5. Michelle borrowed $3r^3 + 5r^2 + 18r + 20$ dollars from her brother. If she paid back $3r^3 + 2r^2 – 2r + 11$ dollars, then how much more money does she still owe her brother?

_____

SECTION D: FIND THE AREA OF THE RECTANGLES PICTURED

Instruction: Kindly answer only 3 questions.





APPENDIX C

MAT MARKING SCHEME BEFORE VALIDATION

POLYNOMIAL IDENTIFICATION

1. $3xyz^3$ - Monomial 2. $2a^2 + b^{-3}$ - None 3. $-4g^2h^3 + gh$ - Binomial

4. $x^2 + 2x - 1$ - Trinomial 5. $5b + 7a - 2b$ - Binomial 6. $\frac{6}{y^2}$ - None

7. $4a^5 - 3a + 2 - 4a$ - Trinomial 8. $4^x + x$ - None

DEGREE OF POLYNOMIALS AND MONOMIALS

1. $3r^8$ (Answer is 8) 2. $-2r^2t^1s^7$ (2 + 1 + 7 = 10) 3. $5x^1$ (Answer is 1)

4. $7x^2y^4$ (2 + 4 = 6) 5. $x^8 + 5x^{12} - 8x^5 + 10x^1$ (8, 12, 5, 1 = 12)

6. $5y^5 + 7y^3 - 3y^7 + 10y^1$ (5, 3, 7, 1 = 7) 7. $9x^2y^3 - 6x^2y^1 + 11x^4y^1 + 4y^3$

2+3, 2+1, 4+1, 3

5, 3, 5, 3 = 5

8. $a^3b^4 - 6a^1b^4 + 9a^3b^1 + 5b^6$

3+4, 1+4, 3+1, 6

7, 5, 4, 6 = 5

ARRANGE A POLYNOMIAL INTO SO POWERS OF X DESCENDING ORDER

1. $5x^5 + 7x^3 - 8 - 3x^8 + 10x$ 2. $3x^2y^4 - 6xy + 9x^3y + 5$ 3. $7x - 8y^3 + 4x^2y + 3x^7$

$-3x^8 + 5x^5 + 7x^3 + 10x - 8$ $9x^3y + 3x^2y^4 - 6xy + 5$ $3x^7 + 4x^2y + 7x - 8y^3$

MULTIPLICATION WITH POLYNOMIALS

1. $-5(4m^2 - 5m - 8)$ 2. $2d(d^5 - 7d^3 + 4)$ 3. $7rs(4r^2 + 9s^3 - 7rs)$

$-20m^2 + 25m + 40$ $2d^6 - 14d^4 + 8d$ $28r^3s + 63rs^4 - 49r^2s^2$

4. $(4z + 6)(4z + 6)$ 5. $(2x + 4)(x + 9)$ 6. $(4b - 3)(4b + 3)$

$16z^2 + 24z + 24z + 36$ $2x^2 + 18x + 4x + 36$ $16b^2 + 12b - 12b - 9$

$16z^2 + 48z + 36$ $2x^2 + 22x + 36$ $16b^2 - 9$

7. $(n + 4m)(2n - 3m)$ 8. $(3x^2 - 2x)(7x - 8x^2 + 9)$

$2n^2 - 3mn + 8mn - 12m^2$

$2n^2 + 5mn - 12m^2$

$21x^3 - 24x^4 + 27x^2 - 14x^2 + 16x^3 - 18x$

$24x^4 + 37x^3 + 13x^2 - 18x$

ADDITION AND SUBTRACTION OF POLYNOMIALS

1. $(5 + 2x + 3x^2) + (7x^2 + 9 - 2x)$ 2. $(7x^3 - 11x + 3x^2) + (2x^2 - 12 + x)$

$10x^2 + 14$ $7x^3 + 5x^2 - 10x - 12$

3. $(-3x^2 + 5xy - 2y^2) - (y^2 + 5xy - 9y)$

$\underline{-3x^2 - 3y^2 - 9y}$

4. $(4y^3 + 5y) + (3y^2 - 2y) - (7y^3 - 6y^2 + 8y)$

$\underline{-3y^3 - 5y - 9y^2}$

5. $(4y^3 - 6y + 8y^2) - (-3y^2 - 7 + 2y^3)$

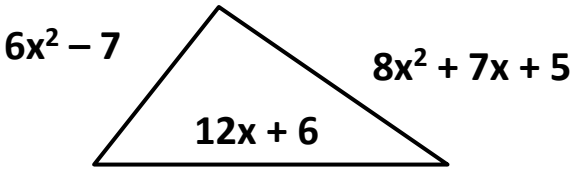
$\underline{2y^3 + 11y^2 - 6y + 7}$

6. $(3r - 5s + 6t) - (5s - 2r) + (11t + 2r)$

$\underline{-10s + 7r + 17t}$

WORD PROBLEMS

1. Find the perimeter of the triangle pictured.



$(6x^2 - 7) + (8x^2 + 7x + 5) + (12x + 6)$

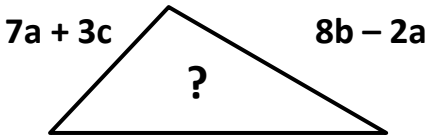
$= \underline{14x^2 + 19x + 4}$

2. A triangle has sides of length $3x + 4y$, $5y + 6 - 2x$, and $7 + 8x$. What is the perimeter of the triangle?

$(3x + 4y) + (5y + 6 - 2x) + (7 + 8x)$

$= \underline{9y + 9x + 13}$

3. Find the missing side for the triangle below with a known perimeter of 12a + 7b + 5c.



$(12a + 7b + 5c) - (5a + 8b + 3c)$

$= 7a - 1b + 2c$

4. A triangle has a perimeter $10x^2 – 3xy + 6y^2$. If two sides are known to be $2x^2 + 2xy$ and $7x^2 + 3y^2$, then what is the length of the third unknown side?

$(10x^2 – 3xy + 6y^2) - (9x^2 + 2xy + 3y^2)$

$= x^2 – 5xy + 3y^2$

5. Michelle borrowed $3r^3 + 5r^2 + 18r + 20$ dollars from her brother. If she has paid back, $3r^3 + 2r^2 – 2r + 11$, then how much more money does she owe her brother?

$(3r^3 + 5r^2 + 18r + 20) - (3r^3 + 2r^2 – 2r + 11) = 3r^2 + 20r + 9$ dollars

FIND THE AREA OF THE RECTANGLES PICTURED

7x

$2x^2 + 6x - 3$

$7x(2x^2 + 6x – 3)$

Area = $14x^3 + 42x^2 – 21x$

3t - 8

t + 12

$(3t – 8)(t + 12)$

Area = $3t^2 + 28t – 96$

APPENDIX I

CONDITIONS FOR ANCOVA USAGE

1. There must be no significant difference between the control and treatment on the Pretest

```
UNIANOVA PreMAT BY Group
  /METHOD=SSTYPE(3)
  /INTERCEPT=INCLUDE
  /CRITERIA=ALPHA(0.05)
  /DESIGN=Group.
```

Univariate Analysis of Variance

[DataSet0] C:\Users\Benedict Aruwa\Desktop\Benny Thesis Files\Benedict Aruwa MAT Analysis.sav

Between-Subjects Factors

		Value Label	N
Group	1.00	AITS	20
	2.00	Trad	20

Tests of Between-Subjects Effects

Dependent Variable: PreMAT

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	6.400[a]	1	6.400	1.152	.290
Intercept	11222.500	1	11222.500	2020.156	.000
Group	6.400	1	6.400	1.152	.290
Error	211.100	38	5.555		
Total	11440.000	40			
Corrected Total	217.500	39			

a. R Squared = .029 (Adjusted R Squared = .004)

Condition 1 fulfilled because Group is non-significant, that is, 0.290 is greater than 0.05

2. Homogeneity of regression

Tests of Between-Subjects Effects

Dependent Variable: PostMAT

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	772.308[a]	3	257.436	7.027	.001
Intercept	946.486	1	946.486	25.837	.000
Group	24.929	1	24.929	.680	.415
PreMAT	15.015	1	15.015	.410	.526
Group * PreMAT	1.543	1	1.543	.042	.839
Error	1318.792	36	36.633		
Total	42668.000	40			
Corrected Total	2091.100	39			

a. R Squared = .369 (Adjusted R Squared = .317)

Condition 2 fulfilled because Group*PreMAT is non-significant, that is 0.839 is greater than 0.05

CHAPTER SEVETEEN

ELECTRONIC LOCAL CONTENTS AVAILABLE FOR INSTITUTIONAL DIGITAL REPOSITORY IN UNIVERSITY LIBRARIES IN NORTH CENTRAL NIGERIA

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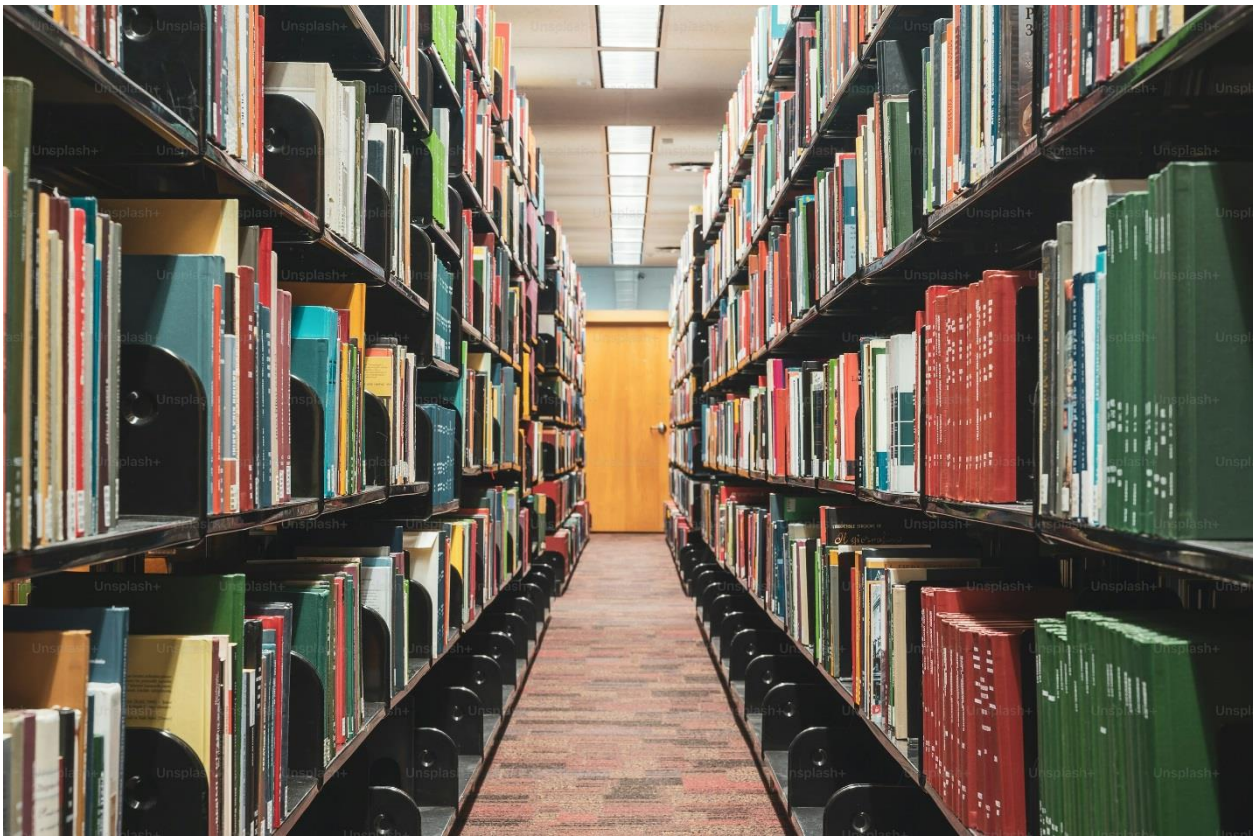

ELECTRONIC LOCAL CONTENTS AVAILABLE FOR INSTITUTIONAL DIGITAL REPOSITORY IN UNIVERSITY LIBRARIES IN NORTH CENTRAL NIGERIA

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17.1 Introduction

The digital age has resulted in the growth of digital information resources in different format, some are in digital born format while some are digitized in tertiary and research institutions across the globe. These digital resources encompass scientific, technological, cultural, artistic, historical and other grey literature generally unavailable to searchers and the public. Gbaje (2012) observed that management of digital information resources requires not only computer hardware but also appropriate software that will ensure proper organization, accessibility, storage and preservation. Several technologies and innovations have been adopted by libraries to manage these digital resources. Recent among them is the use of Institutional Digital Repositories. Institutional digital repositories are being created to manage, preserve, and maintain the digital contents, intellectual output, and other grey literatures of institutions. According to *Drake (2014),* librarians in this digital era must contend with how to manage these resources for optimum use to the benefit of their institutions and in fulfilling their roles as experts in collecting, describing, preserving, and providing stewardship for information resources. Management of library information resources includes the process of acquisition, organization, dissemination, accessibility, storage and preservation. Universities all over the world have since developed different ways of managing, disseminating, detecting and providing access to this increasingly copious amount of materials.

The advent of the Internet has made it possible not only to host search engines but also database and free information resources. According to Fry et al. (2010), ways in which scientific and scholarly knowledge is created and disseminated are undergoing radical change in the light of new digital technologies. The most important among these developments is the Open Access (OA) literature which comprises of free online copies of peer-reviewed journal articles and conference papers as well as technical reports, theses and working papers. OA literature according to Suber (2015) ensures free availability on the internet, permitting users to read, download, copy, distribute, print, search or link to the full-texts of these articles, crawl them for indexing, pass them as data to software, or use them for any lawful purpose without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The primary goal of OA is therefore to maximize accessibility to research publications that forms the basis for future scientific development.

Open Access (OA) can be provided in two ways. The first is through self-archiving process or what Jensen (2010) called “Green” Open Access. Self-archiving is where authors deposit their work on the institutional digital repository which may be a subject-based repository, or a combination of several subjects. The same item may well appear in a traditional journal, which can be print or electronic only. The second is through OA Journals also known by Jensen (2010) as “Gold” provides access to full-text contents of scholarly, peer reviewed journals which could be available either in electronic version or in both electronic and print versions.

Open access institutional digital repository has become one of the most important issues in contemporary times because there has been a proliferation in writings as well as advocacy in support of open access to research outputs. According to Jantz and Wilson (2018), academic libraries are currently at the intersection of two momentous changes in the world of scholarly communication. These are the dramatic increase in the number of journals that are now available on the Internet; the development of internet technology which has permitted and encouraged the democratisation of knowledge and the means to make knowledge widely and cheaply available. The availability of open source institutional digital repository software has encouraged the growth of institutional digital repositories. Cullen and Chanwer (2011) reported that first academic institutional digital repository project was Eprints archive at Southampton, which was founded in 2001 and now internationally renowned as e-prints soton, and the Dspace at MIT.

The term “institutional repository or institutional digital repository” may have dissimilar meaning to different people (Allard et al. 2015). As the concept is rather new, there are diverse opinions on its meaning (Bailey 2015). Generally, an institutional repository is an electronic system that captures, disseminates and preserves intellectual results of an institution. Lynch (2013) has defined a university institutional repository

as a collection of services that a university proffers to its own members intended for the management, organization and diffusion of digital works produced by these members. Crow (2012) and Ware (2014) characterized an institutional repository as open, interoperable, cumulative, perpetual, contributes to the process of scholarly communication in collecting, storing and disseminating the scholarly content. The Scholarly Publishing and Academic Resources Coalition (2012) position paper declared that Institutional repositories are digital collections capturing and preserving the intellectual output of a single or multi-university community, providing a critical component in reforming the system of scholarly communication a component that expands access to research, reasserts control over scholarship by the academy, increases competition and reduces the monopoly power of journals, and brings economic relief and heightened relevance to the institutions and libraries that support them (Crow, 2016).

The main idea of an institutional digital repository according to Abdulsalami and Abdulsalami (2013) is to organise the output and digital content as well as educational and archival materials in universities and academic institutions. Institutional repositories are becoming a new method of academic scholarly communication and dissemination and are considered as an ideal vehicle for making the working of an institution more visible. In a simplified sense an institutional digital repository is an electronic archive of the scholarly output of an institution, stored in a digital format, where search and recovery are allowed for its national or international use. The general idea is to store, manage, and preserve a university's born-digital and digitized assets, making them freely available via the internet.

Institution digital repositories of any institution include wide range of content for its users. The focus of each institutional repository is different in terms of content development, and therefore what content it will store largely depends upon the policy decisions made by each institution or repository administrator. To give an idea of the type of content currently held in a repository worldwide Open DOAR (2013) listed Journal articles, bibliographic references (metadata only), books, sections and chapters, conference and workshop papers, theses and dissertations, unpublished reports & working papers, datasets, content-packaged learning objects, multimedia and audio-visual materials, software and patents.

The university, comprises teachers and students who come together to pursue excellent academic knowledge and researches. Iwe (2010) asserts that a university is a research engine of the society, situated in cities but not really part of them. The people in them are immensely talented, rigorously intelligent, indulging in activities above the daily pursuits of the ordinary people. This community is consisting of professors, doctorial scholars, men and women pursuing mastery over various specific subject fields, together with youths and teenagers undertaking the basic fundamentals of knowledge in diverse fields of learning. This same community, as a result of its broad focus in teaching, research and learning, create knowledge and vital information that are useful to humanity. Most importantly, the knowledge and information created by members of this community are compatible with the culture of the people.

According to Abdulsalami (2010) local content is an expression and communication of a community's locally generated, owned and adapted knowledge and experience that is relevant to the community's situation. Bhattacharjee (2011) asserts that local content of a nation is generally defined as a work which is produced under the creative control of nationals of a country. Meanwhile, the economist definition of local content is that it is the proportion of input which comes from the country itself, as opposed to those imported. Furthermore, Local content is the totality of the culture, values, heritage materials, and indigenous knowledge of a group of people with common interest in a given locality. Ballantyne (2012) also viewed local content as what a community creates, owns, or adapts in terms of knowledge. It is a vital platform for local people to express, share, and communicate locally-relevant knowledge on the issues that affect their lives. Mutula (2017) posits that local content could be referred to as locally-owned, locally adapted, produced, or published content.

Olmeda-Gómez, et al (2018) notes that universities are generators of scholarly knowledge, they publicise the results of their research in globally open articles, using the channels afforded by existing journals to share their findings as widely as possible with different communities and audiences.

17.2 Statement of Problem

Universities all over the world function as a focal point for academic research and as a result of these research activities there are large sum of research findings appearing in different mediums. Egwunyanga (2018) has attributed this to the fact that research has been made compulsory for both faculties and students either by job description or by prescribed academic program of study. For faculties, the concept of “publish or perish” has come to strap their subsistence and promotion within the academic environment to the value of their output and published work. On the part of the students, (especially graduate students) the nature of their academic study demands that they should be actively engaged in research activities in partial fulfillment of the requirements for the degree being sought (thesis and dissertation) and therefore the situation suggests that there is a growing demand for new approach to management of these research outputs.

Institutional digital repositories have, in the last couple of years gained relevance worldwide in management of research outputs. Repositories are often mentioned in connection with the OA movement. Among other organizations, institutions of higher learning appear to be the most that are creating and deploying institutional digital repositories, the availability of which is increasingly tied to their global visibility. Gargouriet al (2010) reported that quality researches that are self-archived in, an OA platform or in, an OA journal or archived in, an institutional digital repository have increased citation impacts.

The immense benefits of institutional digital repository made many universities in the world including Nigeria to establish one in their respective universities. According to Open DOAR (2014), there are only 6 active Institutional Digital Repositories in Nigeria. Some IDR institutions in the North Central include Ahmadu Bello University, Zaria. Kaduna State University, Kaduna, Nasarawa State University, Keffi. Federal University of Technology, Mina. University of Ilorin and Benue State University Makurdi. However, a close look at some of the Universities in North Central Nigeria revealed the non-establishment of institutional digital repository in some of its universities. The universities in North Central Nigeria, like their counterparts in other regions have produced a lot of individual and institutional research. For instance, the University of Maiduguri is well known for research output in the area of history, culture and desertification. For example, the researcher observed that the Annals of Borno have for decades documented and published researches in these areas. Unfortunately, these outputs produced by the Universities in North Central Nigeria are gathering dust in various departmental offices and University libraries without being adequately accessed and consulted. Some eventually get published in local journals that have minimal circulation due to poor distributorship, marketing or prestige. In consequence, these researches may likely die at the institutional level.

This situation, therefore, suggests that there are some likely impediments that prevented the enabling of institutional digital repositories in university libraries in North Central Nigeria considering its robust potentials. What could be the reasons? Could it be the problem of inadequate digital materials, lack of awareness of the potentials of institutional digital repositories or insufficient technological skills among others? The researcher also observed that there is no work done on the adoption of institutional digital repositories among some university libraries in North Central Nigeria. It is against this background and an effort to bridge this gap that the researcher felt a need to investigate the likely factors that the adoption of institutional digital repositories for the management of electronic local content in libraries in North Central Nigeria.

17.3 Research Questions

This study addresses the problem identified in this study by answering the following research questions:

1. What types of digital local content resources are available in university libraries in North Central Nigeria?
2. How do university libraries in North Central Nigeria manage their available digital local content?
3. What ICT infrastructures available for the adoption of institutional digital repositories in university libraries in North Central Nigeria?
4. What ICT skills does staff possess for the adoption of institutional digital repositories in university libraries in North Central Nigeria?

17.4 Objectives of the Study

The general objective of the study is to investigate the factors preventing university libraries in North Central Nigeria from adopting institutional digital repositories and reveal the requisites for its adoption. In specific terms, the research has the following objectives:

1. To determine the types of digital local content available in university libraries in North Central Nigeria.
2. To determine how digital local content are managed by university libraries in North Central Nigeria.
3. To determine the availability of ICT infrastructures for adoption of institutional digital repositories in university libraries in North Central Nigeria.
4. To determine the level of ICT skills acquired by staff for the adoption of institutional digital repositories in university libraries in North Central Nigeria.

The choice of these universities is due to the fact that they are old and as a result there is large number of faculties engaged in researches producing multiples of post-print and pre-print and are also offering Masters and Doctoral programmes, and as such the researcher felt that they have large sum of research output to be managed and also have functional ICT divisions in their university libraries.

17.5 Literature Review

Conceptual Framework

Library digitisation is a new environment for achieving an old goal. Abdulsalami and Abdulsalami (2013) opine that it entails the adoption of technological innovation in capturing, storage, organisation and preservation of library resource. Library digitisation is a process through which materials are converted from hard copies to electronic copies. The term digitisation has been variously defined by different authors not limited to the above definitions given. Digitising is an art of converting the content of a document from hard copy into machine readable format. Digitisation also implies conversion of a document and art works into digital images (Fabunmi, Fabunmi and Paris, 2016). At the tail end makes materials available electronically. Witten and David (2013) went further to define digitisation as the process of taking traditional library materials that are in form of books and papers and converting them to the electronic form where they can be stored and manipulated by a computer.

Reithz (2017) opines that in libraries process of digitisation began with catalog, moved to periodicals, indexes and abstracting services, then to large reference works and finally book publishing. Digitisation of resources in academic libraries are involved in various digital processes, this is confirmed by ARL (2014) who describe digitisation as the process that involves storing of information content in a document, picture or sound or sound files and makes it available in any type of format of organisational choice. Scanning and digitisation are good option for preservation and access to local content of an institution, library collections or books that are fragile in nature and some important documents. The benefits derived from these processes are invaluable ranging from reduction in storage spaces, ability to search for materials electronically faster. Ming (2011) has elaborated the works of Getz (2017), Line (2016) and Mckinley (2017) on the advantages of digitisation. They maintained that:

1. Digitisation means no new buildings are required; information sharing can be enhanced and redundancy of collections reduced.
2. Digitisation leads to the development of Internet in digitalised based libraries. As Internet is now the preferred form of publication and dissemination.
3. Digital materials can be sorted, transmitted and retrieved easily and quickly.
4. Access to electronic information is cheaper than its print counterpart when all the files are stored in an electronic warehouse with compatible facilities and equipment.
5. Digital texts can be linked, thus made interactive; besides, it enhances the retrieval of more information.

In the light of the following advantages, it is natural today to find more information being digitized and uploaded into the Internet or Compact-Disc Read Only Memory (CD-ROM) in order to be made correspondingly accessible globally. Digitisation is embarked upon for a number of reasons which may include: promoting the collection and visibility of the institution globally, reduction of over handling of materials, and promoting access. Hughes (2004) supported this by saying that digitisation promotes access and improves preservation of university's local content, Nigerian university libraries like their foreign counterpart digitise their collection in order to make information that are previously available in

print format and for consumers who physically visits the library to electronic document with larger number of costumers to search for demanded information rapidly and comprehensively. Digitised collection allows users with multiple search and faster access to institutional collection thereby reducing loss of documents to theft. This assertion is supported by Jones (2011) who reported that digitise collection helps in preserving precious materials, making high quality digital version and also making such materials available electronically. Digitisation of priceless and valuable collection of an institution can bring prestige the institution; it will create visibility not only to the institutional content but also the scholar's work within the institution and raise the profile of the institution by showcasing its digital collections which can be useful for public relation exercise (Mckay, 2003; Ezaeni and Ezema, 2019).

17.6 Electronic Local Contents Available for Institutional Digital Repository

With the increasing use of ICTs and availability of open source software packages most of the institutions are creating and maintaining institutional repository or archive to collect, preserve, and make accessible the entire intellectual product created by the scholarly communities of those institutions. Nazim and Mukherjee (2012) asserted that the main objectives for having an IDR are:

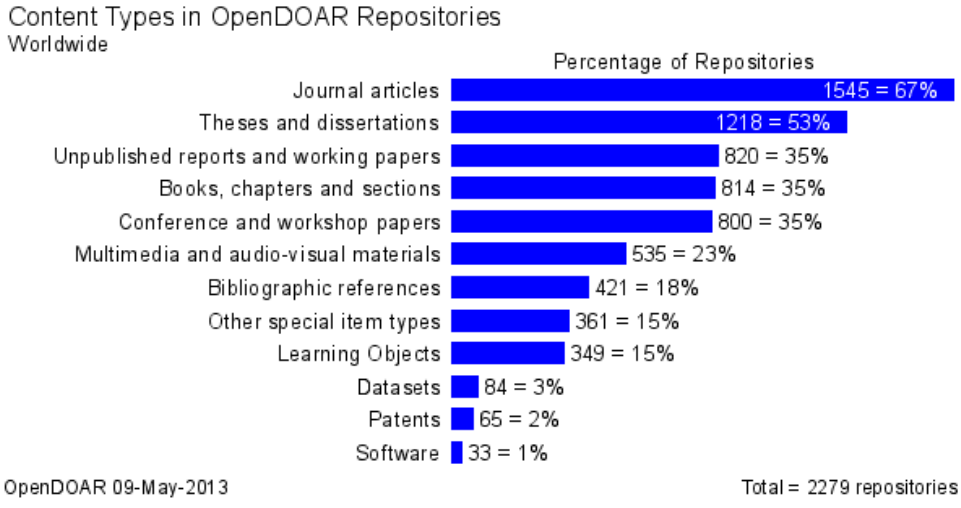
1. To create global visibility for an institution's scholarly research;
2. To collect content in a single location;
3. To provide access to institutional research output by self-archiving it;
4. To store and preserve other institutional digital assets, including unpublished or otherwise easily lost ("grey") literature (e.g., theses or technical reports).

From the objectives of IDR as stated above one will conclude that contents of IDR are all the local contents (digital assets) obtainable in a university. According to Open DOAR (2013) types of digital contents currently held in repositories worldwide are:

- Journal articles
- Bibliographic references (metadata only)
- Books, sections and chapters
- Conference and workshop papers
- Theses and Dissertations
- Unpublished reports & working papers
- Datasets
- Content-packaged learning objects
- Multimedia and audio-visual materials
- Software
- Patents

Summarily, figure 1 below showed the content holdings of various Institutional Digital

Repositories in Open DOAR across the globe



7,045

There are many research made to ascertain the nature of content found in institutional digital repositories either at institutional, national or global level. For example as part of a broader study on IDR development, Ware (2014) analysed a total of 45 institutional digital repositories in detail (around 42,700 documents). In terms of content distribution Ware found that 22% of items were journal articles (both pre and post print), 20% theses and dissertations, whilst 58% were categorized as others, and included mainly grey literature (reports and working papers) as well as a large collection of digital images. One of the conclusions is that the type of data varies considerably, but from inspection it appears that copies of final published articles make up a relatively small proportion (Ware 2014). He concedes that most IDRs are still in the early stages of development, although even the ones that have been around for long have only collected a small fraction of formal research output. Westrienen and Lynch (2015) conducted the first broad and systematic survey of IDR deployment. Thirteen nations were surveyed about IDRs in their country. By means of a questionnaire they were asked to estimate the number of IDRs in their country, the average number of documents, software deployed, disciplinary coverage and other questions related to national policies on IDRs. They were also asked to indicate the relative percentage of documents by content. The list of content types they were asked to estimate were: articles; books and theses; primary data; video, music, etc.; course material; and other (namely). There is no indication how this list was decided. Norway, Sweden and Belgium, reported a larger percentage of theses and books and three countries, France, Italy and the UK reported a prevalence of articles. Netherlands reported 40% theses and 20% articles, but no further percentages are given. Australia reported a higher percentage of non-formal material (83%), namely primary data. US data was reported in a separate article, and although there are no percentages they point out that the study found a significant numbers of institutions are committed to institutional repositories that go far beyond e-prints (Lynch and Lippincott 2015). Additionally this study lengthened the list of content types adding for example: newspapers, data sets, digitized institutional assets from library and museum collections, exhibitions, performances, interview transcripts, maps, plans/blueprints, software and laboratory protocol. There is no data for the remaining four countries. A key finding of the survey is the difference in the main drivers behind the creation of the IRs between countries and the impact this has on content collection. Except for the US and Australia, they found a strong emphasis on textual material for the IRs with the focus still being very much on traditional publications. Chimezie (2012) while reporting the nature of Local contents found in university communities. He asserts that local content resources are primarily borne out of scholarly research of the university community. Some of the local content originating from university communities includes;

- Books
- Thesis and Dissertations
- Practical Research Records
- Journal Articles
- Project Reports
- Inaugural Lecture Recordings and Papers
- Evaluation Reports
- Technical Reports
- Workshop Reports
- Working Papers
- Conference Papers
- Conference Proceedings
- Field Trip Films And Records
- Inventions
- Records of community services of academics and
- Patents

17.7 Management of Digital Resources and Digital Library Software

The digital age has resulted in the growth of digital information resources in different format, some digital born format while some are digitised. These digital resources encompass scientific, technological, cultural, artistic, and historical materials generally unavailable to searchers and the public. Institutional repositories are now being created to manage, preserve, and maintain the digital contents, intellectual output, and histories of institutions; however these materials are appearing kept in different format but mostly in PDF file as posited by Borghoff et al (2016) that PDF and TIFF are the de facto standards for digital documents. Also the data collected shows that PDF/4, XML, ASCII and Open Office file format are the file format not used to collect digital local content in the sampled libraries. Similarly, Drake (2014) captured that librarians in this digital era must content with how to manage these resources for optimum use to the benefit of their

institutions and in fulfilling their roles as experts in collecting, describing, preserving, and providing stewardship for information resources. Management of library information resources includes the process of acquisition, organization, dissemination, accessibility, storage and preservation. Similarly, Gbaje (2012) observed that Management of digital information resources requires not only computer hardware but also appropriate software that will ensure proper organization, accessibility, storage and preservation. Universities all over the world have since developed different ways of managing, disseminating, detecting and providing access to this increasingly copious amount of material.

However, in the digital era where institutions create their own information resources as research output, conference papers, technical reports etc., libraries are also expected to play a vital role in the management of these digital information resources. According to Islam (2010) digital resources or digital information resource are those resources whose deal with both born digital and digitized materials which can be either accessible from library's in house database or from the world-wide-web, in that case materials must have preserve the copy right law, for both the born digital and digitised format, some resources will be permissible to furnish information in full text and others will be limited to metadata and some resources will be freely accessible for anyone from anywhere in the world and others will have limited accessibility due to the library's policy and for cost related issues and also for the authentication.

Libraries manage and disseminate a wide variety of information resources most of which are created outside the world of their institutions. The management of electronic local content information resources created by the institution itself, staff of the institutions and other user communities has remained a challenge. The management process of print resources is completely different from the management of the ever growing digital information resources. Management of digital information resources requires not only computer hardware but also appropriate software that will ensure proper organization, accessibility, storage and preservation. Libraries, the traditional holders and distributors of institutional knowledge, often have difficulty managing the vast quantity of diverse institutional information resources that have come under their custodianship (Gbaje, 2012). Universities have since developed different ways of managing, disseminating, detecting and providing access to this increasingly copious amount of material. In recent years, institutional repositories have been proposed as a tool for digital resource management and dissemination (Harnard, 2013; Crow, 2012b; Hubbard, 2013; Lynch, 2013). In 2000 the appropriately named EPrints was launched by the University of Southampton, followed a couple of years later by DSpace produced by the Massachusetts Institute of Management Technology (MIT) in conjunction with Hewlett Packard (Smith, Barton et al. 2013). This was followed by other software such as Digital Commons offered by BePress and the use of tools such as Fedora and Greenstone for institutional digital repositories. Table 2.1 below shows the usage of repository software in repositories registered in OpenDOAR (Directory of Open Access Repositories) from May 2013.

S/N	Software	Number	%
1	Dspace	940	41.2
2	Eprints	328	14.4
3	Digital Commons	97	4.3
4	OPUS	73	3.2
5	Unknown	278	12.1
6	Others	563	24.08
	Total	2279	100

Table 1: OpenDOAR - 09-May-2013

EPrints, DSpace and Fedora are considered to be the leading software for repository development. It has been suggested that the choice of software for the repository can have repercussions on the types of materials that are collected and the ways in which they are handled, although this has not been thoroughly studied. The DSpace information model is based around the idea of Communities that manage Collections. DSpace allows different Communities to set their own collection policies, including permissions to deposit, types of materials that are allowed for deposit and so forth. The software uses a system for persistent identifiers in order to help ensure long-term stable access and aid with preservation issues (Smith, Barton et al. 2013).

EPrints on the other hand, was developed from the e-print server technologies and is developed to be an out of the box system (Tansley and Harnard 2011). In an analysis of different repository software, Sale

(2017) indicates that EPrints requires little technical expertise to install but that larger universities will possibly require more powerful software options such as DSpace or FEDORA. FEDORA is a digital object and repository architecture designed to achieve these requirements, while at the same time providing extensibility and interoperability. The key features of the architecture are: support for heterogeneous data types; accommodation of new types as they emerge; aggregation of mixed, possibly distributed, data into complex objects; the ability to specify multiple content disseminations of these objects; and the ability to associate rights management schemes with these disseminations. Masrek and Javadi (2012) identified the strength and weaknesses of some major IDR software; these include:

Strengths of DSpace

1. Manageability and customizability of workflows are more flexible and more developed than other packages
2. More structured data model
3. Ability to address the long-term preservation of digital objects
4. Security related functions in DSpace is more progressive than other solutions
5. More capable of integration with other information systems
6. Could be considered as an easy-to-use and low-cost solution for a wide range of institutions
7. Installation and maintenance steps (backup, recovery, import, update, etc.) are explicit and can be conducted easily
8. Expectancy of future expansion
9. Good choice for quick deployments
10. Installation, administration, and maintenance processes are well-documented.

Weaknesses of DSpace

1. Code base of DSpace is complex to be modified for low level customizing.
2. The scalability challenge is a major risk of selecting DSpace for sustainable digital repositories.
3. DSpace consists of many tools and applications and its structure and code base is complex for being specialized for new or special needs of an institution.
4. The developer team of DSpace has decided to re-architect this software for next year and it may affect variety add-ones that are based on the current version.

Strengths of EPrints

1. Several separated installations could be merged to establish an integrated digital repository.
2. Robust and stable system that needs minimum maintenance
3. Less complex compared to others
4. Complete solution for handling wide range of pre-print and post-print research documents
5. Many plug-ins are available to improve different functionalities of EPrints.
6. A uniform and well-documented code base makes it easier to work on for low level customization.

Weaknesses of EPrints

1. Indexing process is slow compared with other packages.
2. The number of file formats that are supported by default is limited.

Strengths of Fedora

1. More flexible and extensible solution compared to other systems and a good choice for managing complex objects and relationships
2. The infrastructure consists of two main components: the storage system that is placed in the back-end and the interface for users and administrators in front-end. This system architecture makes Fedora a flexible and extensible solution.
3. Availability of progressive Application Programming Interface (API) makes it possible for various types of client applications to establish a conversation to Fedora and request services.

Weaknesses of Fedora

1. Fedora is a web service in its nature and needs a number of additional web applications and tools for being utilized as a complete digital resource management system. In terms of implementation
2. Fedora is the most complex system among compared solutions because of its complicated steps of installation, which requires an expert administrator for implementation.
3. In comparison with other systems, Fedora is not well documented.
4. However, any decision about which IR software platform to choose must be based not only on the technical and functional capabilities of the system but also in determining best fit with organisational IT strategy and with the availability of local software development effort.

17.8 ICT Infrastructure for Adoption of Institutional Digital Repository in Nigerian University Libraries

Information and communication technology (ICT) consists of hardware, software, networks and media for collection, storage, processing transmission and presentation of information (World Bank, 2011). ICT is made up of two basic components; the information technology (IT) and the communication technology (which include the internet and telecommunication technology). Information technology refers to the creation, storage and processing of data through the use of computers and other microelectronics. Through convergence the link between information technology and communication technology is what is now commonly referred to as Information and communication technology (ICT). Another description of ICT as given by Akintunde (2004) is apt at this moment. According to him, ICT is a terminology, which has overtaken information technology, because of its appropriateness, and its utilitarianism. He further opined that whereas IT was terminology used in the 80s and 90s; (ICT) has taken over since then. While IT focused on computer, ICT emphasises the used technology for development, thus focusing on the use of computer and other technologies such as telephone to process, transfer voice and other data singularly or mixed with little interference or distortion of content. It is this latter emphasis that has led to more interest on how services in the library can be repackaged to reach library users any time anywhere.

According to Agoulu and Agoulu (2012) the global information revolution of the 20th century made manual system of delivering information services in the libraries especially academic and research libraries mundane, clumsy and inefficient, though the era of total electronic or paperless is yet mirage. The bulkiness, growth rate of information and difficulties positioned by updating of manually based system makes it difficult for effective service in modern time (Ikem and Ajala, 2011). Similarly, Gbaje (2017) posited that librarians and information professionals are then challenged to create information system for the collection, organisation, dissemination and preservation of information and new knowledge regardless of formats. This new age of information offers possibilities for the future with information delivered in different formats limited only by boundaries of our imagination. Also the potential of the electronic are breathe taking the prospect of change as wide spread and fundamental as the agricultural and industrial revolution of the earlier eras. In the last couple of years, students, lecturers and other target users of library in Nigerian tertiary institutions have increasingly demanded and preferred access to electronic sources delivery and networked information from their respective libraries (Covi and Cragin, 2014). Internet access is one of the greatest technological advancements being experienced in this 21st century. It revolves around advancements in Information and Communication Technology which has gone a long way to influence the mode of information gathering, storage, retrieval and dissemination in these times. Internet access is used for electronic mailing services, electronic on-line chats, group activities among others (Akintunde, 2016). It has resulted in increased access to timely, accurate, relevant and current information in most ICT compliant libraries all over the world.

Furthermore, the globalization of the entire world in recent times has placed additional demands on academic libraries to conform in order to avoid the risk of obsolescence and irrelevance in the scheme of things. Teaching and research in tertiary institutions now demand the use of high caliber ICT infrastructure and facilities to keep abreast of current information in all fields. According to Omekwu (2016) information growth has been exponential and the concept of information explosion is no longer new to information professionals. However, there are current developments in the professional horizon that impact on professional practice and the emerging roles of librarians in a global environment.

Be that as it may, Akintunde, (2016) opines that many libraries in Nigeria still operate in the traditional service pattern where librarians are in charge in main service points of circulation, reference, serials, acquisition, cataloguing and documents without any emphasis on academic disciplines. This is a sad

affirmation of a similar complaint made years ago by Afullo (2011) that Nigeria was rated among the lowest in Africa in telecommunication infrastructure and so not much is expected of academic libraries in Nigeria, though the situation seems to have improved overtime to some extent. One of the major problems militating against globalization of information services in academic libraries in Nigeria is the dearth of ICT infrastructure and facilities. This problem has been lamented severally by authors such as Chizenga (2011), Oketunji (2011), Okiy (2013), Gbaje (2017), and Akanni (2018). To date, many of the problems militating against adequate provision of ICT facilities and services in academic libraries in Nigeria as enumerated by Alasa and Kelechukwu (1998) are still very much with us. These problems include:

- Poor and inadequate telecommunication facilities;
- Poor level of ICT literacy even within the academic community;
- Poor computer facilities;
- Poor level of awareness of internet facilities in the academic community;

Minimum involvement of academic institutions in network building and diffusion in Africa;
Ignorance of decision or policy makers of the power of information network on the economic and industrial development of a nation.

Moreover, on the dearth of ICT facilities, Oketunji (2011) further identified two major challenges such as:

- A largely exploitative local computer market and unsatisfactory after sales maintenance and support;
- Inadequate pool of relevant technical staff with the problem or difficulty in their recruitment and retention.

17.9 ICT Literacy Skills for Adoption of Institutional Digital Repository in Nigerian University Libraries

In the opinion of Hayati and Jowkar (2018) ICT literacy has varied definitions, based on the definition of ICT as given by Oketunji (2011) is the application of computer and communication technology to information handling. The use of these technologies requires certain ICT literacy level. King (2017) defines ICT literacy as the ability to use digital technologies, communication tools or networks to solve information problems in order to function in the information society. In a counter definition by Rockman (2015) define ICT literacy as the ability to know what resources are available, what information is within these source and how to use technology to access and communicate information. Information technology is anything used to enhance or facilitate collection, storage, and transmission of information. Information technology has fundamentally affected the operations of library and information services and this has also had great impact on the skills and training requirements for librarians. In the past years many information technologies that have impacted on library and information service delivery have been created. According to Burke (2019) these technologies fall into three main groups:

- Those created specifically for libraries and library work: these include the Dewey's classification system, the card catalog and the machine readable cataloging (MARC)

- Those created with the larger world and adopted for use in libraries: these include Integrated Library Systems to offer online catalogs, acquisition, circulation, online databases and website design.

- Those created in the world and brought into libraries without much alteration, such as telephone, copiers, bar-code scanner and reader.

Library technologies are ever-changing, and a working knowledge of them is necessary for effective information service delivery in the digital work environment. Ramana (2019) posited Library and Information Science Professionals are facing many major paradigm shifts creating a new information environment, hence the need for training and retraining in all the available avenues as posited by Tannent (2015) that training can take many forms, and each library should use the mix of training strategies that best meets their needs which really dictates the increased importance of professional competencies.

- Technology applications in library operations & services
- Transition from paper based resources to digital and multimedia resources

- Shift from acquisition to accessing the resources
- Emphasis on information rather than the documents
- User demands information access facilities at their desktops.

Gbaje and Ukachi (2011) asserted that information technology has fundamentally affected the operations of library and information services. In academic library, digital information resources of all sorts are available free or by institutional license thereby making information technology an indispensable research tool. Bazillion (2011) also assert that because so many research materials are available electronically, it requires information technology skills to facilitate access and user of digital materials are indispensable.

In recent time, development such as digitisation of local content, retrospective conversion, CD-ROM services, institutional repositories, online reference service etc have made their way into Nigerian university libraries. Ochai (2017) opined that digitisation is the new wave of air blowing many libraries globally simply because there is increasing amount of information now available in digital form and this is likely to have significance consequences for information profession practice.

Digitisation projects in the library will require skills and knowledge on how to digitize non-digital born documents using scanners and digital camera. Skills to effectively install and configure open source software and use digitisation software such as Dspace, e-prints, etc, are also required for effective digitization project in the library. According to Robinson (2019) familiarity with the following is important to effectively manage a digital library software/institutional digital repository.

Standard web-based software systems including (but not limited to) Unix, Linux, SQL Server, MySQL, SGML, XML, PHP, JAVA, PERL, Apache

At least one major repository software including (but not limited to) EPrints, DSpace, Fedora, OPUS Digital Commons

There are several authors across Nigeria that has assessed the level of ICT literacy level among librarians in different environments. In a study conducted by Adedoyin (2015) discovered that a gap existed between desired levels of ICT literacy and the actual level of literacy of the surveyed librarians. In a similar study among academic libraries in Enugu state Ugwuanyi (2019) revealed that the level of ICT among librarians is low due to non-availability of ICT infrastructure in most of the tertiary institutions thereby hindering effective acquisition of ICT literacy skills. It also revealed that librarians were interested to adopt the current trend of ICT literacy and application in the present day ICT environment but were incapacitate by limited self-effort and library management policy decisions. Current to all was the survey study conducted by Gbaje and Ukachi (2011) their sample of 20 professional librarians from University of Lagos and Ahmadu Bello University libraries, their study established that to work in the digital environment, librarians need Information Technological skills such as how to use the Library Integrated Library Systems, Portable Document Format (PDF) Software to download, save and print, and searching library online databases, the study also revealed that the sampled academic librarian have been attending different IT workshops and trainings, however much is still desired in the IT training for librarians as identified in the training needs of the sampled librarians.

17.10 Challenges of Adopting Institutional Digital Repositories in Nigerian University Libraries

Open access to scientific information can greatly benefit all players in the scientific communication system which includes scientists, authors, institutions, libraries, publishers, funders, and society as a whole, avoiding a duplication of scientific efforts, which saves time and money, is one of its main advantages. In the particular case of authors and institutions, it can help them reach a much bigger audience than that provided by subscription journals even the most prestigious and popular ones. Various surveys have revealed an increase in the visibility and impact of papers, based on the amount of citations received (Swan and Brown, 2017; Durrant, 2014).According to Chan and Costa (2015) the benefits of open access particularly open access repositories in Nigerian Universities will include: improved access to institutional research output; improved citation and research impact; and cost effectiveness in information dissemination on the part of the institutions. The increased research impact of open access articles due to citations has also been acknowledged by many scholars (Harnad, 2013). In the current system of scholarly communication, developing countries may be considered to have low research impact due to limited visibility of research output from such countries. Despite the promising potential of open access to

improve scholarly communication in developing countries, the new form of scholarly communication is little exploited in such countries when compared to developed countries (Durrant, 2014).

The development of open access institutional repositories requires fast and reliable internet connection as well as deployment of adequate information and communication technology infrastructure. The major point of internet access to students and staff at Nigerian universities is through internet cafés (Christian, 2011). A study of Internet usage in Obafemi Awolowo University by Jagboro (2013) showed that 45.2 percent of the respondents access the Internet through Internet cafés. The situation is not too different at the University of Lagos as reported by Christian (2011) that there are about seven of such commercial internet café at the University each with an average of about 20 computers. The cafés are operated by private entrepreneurs on facilities or buildings leased from the University. The average cost for using the internet facility at the café is about $1 for an hour. Although this may appear cheap, the connectivity is so slow that it may take about 15minutes to access a yahoo mail account. There is also a university local area network (LAN) that provides internet connections to the academic staff but the university's LAN is so often plagued with technical issues that even the academic staffs often do patronize the cafés for internet access. Electricity supply is a major problem in developing countries like Nigeria. This problem has made the development of projects like an institutional repository in Nigeria much difficult and expensive. Fatunde (2018) has observed that poor electricity supply is a major impediment to the operation and growth of information and communication technology in Nigerian universities. Another institution that has had to deal with this problem in its effort to develop an institutional digital repository is the International Institute of Tropical Agriculture (IITA). The Institution which is at the final stage of developing an open access institutional repository also had to locate its server in the United Kingdom due mainly to the incessant problem of power supply in Nigeria. While 27.4% of the respondents at the University of Lagos 'strongly agree' that inadequate information and communication technology infrastructure is a problem to the development of institutional repository at the university, 46.8% 'agree' to that proposition. Various other researches has also confirmed that many institutions in developing countries face an unreliable electricity supply, poor Internet connections, as well as a lack adequate computer equipment, appropriate software, and even technological expertise (Arunachalam, 2013).

Lack of funding is another major problem experienced by developing country institutions in their effort to establish digital repositories. As has been stated above, the state of ICT infrastructure in academic and research institutions in developing countries like Nigeria is so low to sustain the development of institutional repositories. Hence a viable digital repository project will first require serious upgrading of the current state of ICT facilities in many academic and research institutions in Nigeria (Durrant, 2014). Development of institutional repository in developing countries is much a capital intensive project than in developed countries. This is because academic and research institutions in developed country already have in place a well-established state-of-the-art ICT infrastructure to build on. But in developing countries, this infrastructure or foundation is not in place and will require huge financial resources to put them in place (Arunachalam, 2013).

One of the best ways to promote the development of open access institutional repository in developing countries according to Abdulsalami and Abdulsalami (2013) is through advocacy. For such advocacy to be really effective, it must be undertaken by the stakeholders in the region. These stakeholders include lecturers, researchers, librarian as well as students. Effective advocacy presupposes that the advocates or stakeholders are very familiar with the concept. Unfortunately, as we have seen in the course of this discuss especially from the research data presented above, knowledge of open access institutional repository is very low among the major stakeholders in the developing region.

Another issue that may affect the development of institutional repository is intellectual property. The International Institute of Tropical Agriculture (IITA) in Nigeria institutional repository could not go public due to some copyright issues that needed to be resolved. It happened that copyright in research works conducted by the researchers at the Institute was signed away to the journal publishers when the papers where submitted to commercial journal publishers for publication. Curiously, the Institute lost the right to make public research works it has funded and now have to negotiate the right from the journal publishers (Christian, 2011). Intellectual property right is an aspect of law that covers diverse legal rights that exists in creative work. Intellectual property law embraces such exclusive rights in copyright, patent, trademark, industrial designs, trade secret, trade name etc. Copyright law determines how a person can deal with a written work such as a journal article or a research paper. Generally, a copyright holder has the exclusive right to authorize the copying, recopying or distribution of the written work. In other words, she/he has the

right to determine whether the work shall be available in a closed or open access format (Christian, 2018).

Some of the issues identified by existing literatures as being responsible for the slow uptake of Institutional repositories in Africa include lack of knowledge or awareness of open access institutional repository, poor state of information and communication technology, inadequate advocacy for open access repositories, poor or inadequate funding, and copyright and intellectual property rights (Christian, 2018).

17.11 Summary of the Review

From the above review, it can be summarized that the main reason of setting of an institutional digital repository in any institute is to collect, organise, preserve and make it readily available to wider audience the local content of its parent institutions. These will often enhance research, author visibility, and digital preservation and prompt access to genuine research report of scholars across the globe irrespective of geographical location. Virtually all the local content emanating in Nigerian institutions are not borne digital hence, the need for digitisation, which is seen as the first step in establishing institutional digital repository. Digitisation in its simplest sense is an act of converting non-digital materials into digital format. Digitisation of local content in a library is of paramount value, especially grey literature; these literatures usually formed electronic local content and often found in intuitional digital resources i.e. journal articles, book sections and chapters, thesis and dissertations, datasets, patents, conference and workshop papers etc.

There is alarming growth of digital information resources. This resulted to complication in management of such resource, hence he need for use of various digital resource management software platform i.e. Eprints, Dspace, SCOPUS, Digital Commons among others, each of these platform are peculiar with limits and delimitations, hence their choice is situational. Awareness and advocacy of institutional digital repository is seen as one of the most important means of promoting IR, the review concluded that there is little done on this aspect in Nigeria. Despite the numerous advantages offered by deployment of ICT facilities in libraries the situation in Nigeria is not encouraging as it is attributed to several factors such as inadequate telecom facilities, poor ICT literary, poor funding, lack managerial cooperation among others, also constraints of implementing IDR in Nigeria not far different to that of deploying ICTs.

Methodology

Survey research method was employed for the study. Survey research is widely regarded as being inherently quantitative and positivistic, and is contrasted to qualitative methods that involve participant observation, unstructured interviewing, case studies, focus groups, questionnaires etc. According to Aina (2012) survey research is accomplished through observation, interviews and administering of questionnaires to a relatively large representative sample of the population. Similarly, Creswell (2013) also asserts that, survey research is a set of orderly procedures specifying the information to be obtained and from whom and how. In a similar vein, Ifidon and Ifidon (2017) view survey research as the type of research methodology that gathers data from a population in order to determine the current statues of that population with respect to one or more variable. From another perspective, Bryman (2018) observed that survey approach allows a concentrated focus on a single phenomenon and the utilisation of a wide array of data gathering methods. Osuala (2015) expatiates further, the major advantage of survey research when he express that survey research studies both large and small population by selecting and studying samples chosen from the large population to discover relative incidences, distribution and interrelations of sociological and psychological variables and by containing the entire population if it is small. The choice of survey research for this study lies in the fact that the research involves gathering of required data from the sample of six University Libraries in Northeast Geopolitical Zone of Nigeria on a non-existing phenomenon. This can be best supported by Ali (2016) who states that survey is a type of descriptive research which uses sample data to describe and explain what is existent or non-existent on the present status of a phenomenon being investigated. However, since this study is fact finding research about adoption of Institutional Digital Repository in University Libraries in North Central Zone of Nigeria, survey research method is found to be most appropriate for use. The population for the study was made up of the six University Libraries in North Central Zone of Nigeria with functional ICT units which included Kogi State Library, Federal University of Technology Mina Library, Ahmadu Bello University Library (KIL), Benue State University Library, Nasarawa State University Library and University of Ilorin Library. .The target population of the study cuts across the heads of ICT/media division/units/departments and the staff of libraries under study.

Sample and Sampling Procedure

All the staff in ICT departments/units/divisions of the six selected University Libraries in North Central Nigeria was used in the study.

Table 1: Population of the Study

S/N	Name of Library	Head, ICT	ICT Staff
1	Nasarawa State University Library (**NASU Library)**	1	6
2	University of Ilorin library (**UNI ILORIN Library)**	1	6
3	Federal University of Technology Mina **(FUT MINA Library)**	1	7
4	Benue State University Library, Makurdi (**BENSU Library)**	1	4
5	Ahmadu Bello University, Zaria (**ABU Library)**	1	8
6	Kogi State University Ayingba (**KSU Library)**	-	-
Total		**5**	**31**

The reason for choosing all the staff for the study is, as noted by Mohammed cited in Ibrahim (2001), with relatively small population the best sample is the population itself. Bernard (2012) also supported this by asserting that if a population of a study is less than two hundred the entire population should be used for the study. Hence all the six heads of ICT departments/units/divisions and the thirty one staff from the selected libraries were used for the study except Kogi State University Library not visited because of closure at the time of sampling, making a total of thirty six (36) staff.

It is common, of course, for researchers to use several research instruments. The use of several methods gives the opportunity for the researcher to verify and validate the information being gathered (Blaxter et al, 2011), as well as to help in avoiding any error that might affect the data. Hence, the instruments used to collect data for this study were observations and semi-structured questionnaire. Ihanacho (2004) explained that the questionnaire as a survey research instrument is designed in question form to obtain feedback information from subjects with respect to their opinions, attitudes beliefs and motives regarding a situation. The questionnaire is one of the techniques that are frequently used in survey research for data collection, hence its adoption. Two types of closed ended questionnaire were used for the study. One for Head of ICT/media departments/divisions/units in the selected libraries and the second is for other staff (e-librarian) in such departments/divisions/units. According to Ibrahim (2013), observation is an act of noting and recording phenomenon using instruments such as weighing scales, clocks, telescopes, cameras, etc. The second instrument employed for data collection in this study was observation. Observation was employed to authenticate the data collected through the questionnaire. The researcher made several preliminary visits to the university libraries under study during the year of 2013 and 2014. During these visits the researcher made direct observations on the libraries' current state of IT applications such as the use of electronic equipment, computers, electronic services, use of communication technology, Internet facilities, librarian's perceptions, interactions and attitudes toward recent technology and service procedures particularly in the area of the development of Institutional Digital Repository.

Validity is the extent to which an instrument measures what it is supposed to measure and performs as it is designed to perform. It is rare, if nearly impossible, that an instrument be 100% valid, hence the need for validation. Cohen et al. (2010) defined validity as an important key to effective research. If a piece of research is invalid then it is worthless. Therefore, validity is an essential element in order to ensure maximum validity for the research. To ensure the validity of the instruments, the instruments were issued to the supervisors of this work and other faculty members in the Department for scrutiny.

A pilot study was conducted at the outset of the research for the purpose of testing the method of data collection and also to pre-test the questionnaire and Interview schedule in Kano State University of Science and Technology (KSUST) library on head of ICT/media departments/divisions/units and the staff to test the reliability. (KSUST) Library was chosen because it is not in the study base. It was hoped that

any difficulties inherent in the administration of these instruments would be revealed during the conduct of the pilot study leading to the acceptance of the research method, revision of the instruments, or adoption of another research method. The procedure for the pilot study entailed administering questionnaires to the respondents personally and physically inspecting the ICT facilities available in the libraries.

The completed questionnaires were carefully examined to determine if any changes or additions were necessary and if any difficulties were encountered. Although no formal statistical test was conducted owing to the small size nature of the sample. To authenticate the study the researcher solicited permission from various head/unit to be allowed to observe the physical state of IT applications use, such as electronic equipment, computers, electronic services, use of communication technology, Internet facilities etc. The data collected were analyzed using the Statistical Package for Social Sciences (SPSS). Frequency table was used in presenting the data collected and simple percentage was used to analyze the data that relate to research questions.

Response Rate

This section analyzed and discussed the data collected with regards to the four research questions raised for this study. Frequencies and percentages were used to compute and present the results. Out of the total number of 36 copies of questionnaire distributed to the respondents, all the 36 were returned duly completed. This represented 100% response rate. Table 2 shows the response rate.

Table 2: Response Rate

S/N	Name of Library	Head, ICT	ICT Staff
1	Nasarawa State University Library	1	6
2	University of Ilorin library	1	6
3	Federal University of Technology Library Mina	1	7
4	Benue State University Library	1	4
5	Ahmadu Bello University Library	1	8
Total		**5**	**31**

The high response rate was achieved because of the fact that the population was very small, and the researcher formally sought for permission from the University Librarians of all the libraries surveyed, who subsequently instruct all the staff of the ICT/Media units to give the researcher all the necessary support and cooperation for the data collection.

Types of Digital Local Content Available in the University Libraries Studied

One of the objectives of this research is to determine the types of digital local content available for the establishment of Institutional Digital Repository in libraries in the Northeastern Nigeria. In order to achieve this objective, the researcher first attempted to identify the digital local content available in libraries under study. To do this, a list of digital local content was provided for the respondents to tick as many as applicable to the libraries studied. This is shown on table 3.

Table 3: Types of Digital Local Content Available in the University Libraries

Digital Local Content	NASU Library	UNI ILORIN Library	FUT MINA Library	BENSU Library	ABU Library
Pre-print Journal articles	X	X	X	X	X
Post-print journal articles	X	X	√	√	√

Books, sections and chapters	X	√	X	√	√
Conference and workshop papers	√	X	X	X	X
Theses and Dissertations	√	√	X	√	X
Unpublished reports & working papers	X	X	X	X	X
Datasets	X	X	X	X	X
Content-packaged learning objects	X	X	X	X	X
Multimedia and audio-visual materials	√	√	√	√	√
Software	X	X	X	X	X
Patents	X	X	X	X	X

Key: X = Not Applicable √ = Applicable

Table 3 above shows that only multimedia and audio-visual materials are found in all the libraries studied while none of the libraries have pre-print journal articles, unpublished reports & working papers, content-packaged learning objects, software and patents. However, only NASU Library reported availability of conference and workshop papers. This poor availability of digital local content may not be unconnected with lack of digitisation efforts of local content in Nigerian university libraries despite its importance as reported by Mckay (2013), Ezaeni and Ezema (2019) who asserted that digitisation of priceless and valuable collection of an institution can bring prestige to the institution; it will create visibility not only to the institutional local content but also the scholar's work within the institution and raise the profile of the institution by showcasing its digital collections which can be useful for public relation exercise.

ICT Facilities Available for the Management of Digital Local Content in the Libraries in North Central Nigeria

One of the major problems militating against globalization of information services in academic libraries in Nigeria is the dearth of ICT infrastructure and facilities. This problem has been lamented severally by authors such as Chisenga (2010), Oketunji (2011), Okiy (2003), Gbaje (20017), and Akanni (2018). The state of ICT facilities for the management of electronic local content is presented in the Table 4 below.

Table 4 ICT Facilities Available for the Management of Digital Local Content in the Libraries

Hardware Facilities	NASU Library	UNI ILORIN Library	FUT MINA Library	BENSU Library	ABU Library
Desktop computers	√	√	√	√	√
Laptop computers	√	X	√	√	√
External HDD	√	√	√	√	√
Server computer	√	√	√	√	√
CD-RW	√	√	√	√	√

DVD-RW	√	X	X	√	√
Magnetic Tape	√	X	X	X	X
Flash drive	√	X	X	√	X
Hard Drive	√	√	√	√	√

Key: X = Not Applicable √ = Applicable

NASU Library

Table 4 above revealed that all the libraries studied have desktop computers, server computer, external HDD and scanners while only Uni. Ilorin library reported non availability of laptop computers. Despite the importance attached to digital memory sticks and magnetic tapes in managing digital local content in libraries, only NASU library reported availability of magnetic tape. The most popular storage media for storing digital local content by the libraries studied were CD-RW and Hard Drive as shown on Table 4. This corroborates Gladney's (2017) assertion that the current best digital storage medium is the hard drive storage media. None of the institutions studied used memory stick while only NASU library reported the use of magnetic tape to store digital local content.These findings contradict the studies of Chisenga (2016), Oketunji (2011), Okiy (2013), Gbaje (2017), and Akanni (2018) who reported acute shortage of ICT facilities in Nigerian University Libraries in their respective studies. The researcher discovered that the improvement of ICT facilities in libraries is as a result of the intervention of TETFund, NITDA, NCC PTDF and other relevant bodies.

Acquisition and Adoption of Digital Local Content by Libraries Studied

Resources in libraries are acquired in different ways and digital local contents are not exceptional; hence the need to investigate how these libraries acquire their digital local contents. To achieve this, a list of mode of acquisition of digital local contents was provided for the respondents to select from as shown in the Table 5 below.

Table 5: Acquisition and management of Digital Local Content

Mode of Acquisition	NASU Library	UNI ILORIN Library	FUT MINA Library	BENSU Library	ABU Library
Donations	√	√	√	√	√
Deposition from Staff	√	√	√	√	√
Deposition from Students	√	√	X	√	√
Solicitations	√	X	X	√	X

Key: X = Not Applicable √ = Applicable

The Table 5 above depicted the responses of the respondents on how digital local content are acquired in the libraries studied. An observation of the Table revealed that all the libraries acquire digital local content through donation while only FUT library reported that it does not acquire digital local content through deposition from students. However, the Table revealed clearly that the libraries do not properly engage in solicitation on digital local content from the library community because only NASU Library and BENSU Library, ABU reported to have acquired digital local content through solicitation.

Educational Qualifications of Répondent on ICT Skills for the Management of Electronic Local Content in the Libraires

This research question was raised to identify the adequacy of qualified staff for the adoption of institutional digital repository for the management of electronic local content in the libraries studied. In order to achieve this, a list of options containing different educational qualifications obtainable in university libraries was provided for the respondents to tick as applicable. The table 6 below provided a summary of the responses of the respondents.

Table 6 Educational Qualifications of Répondent on ICT Skills

Educational Qualification	Freq.	%
SSCE	3	8.3
Diploma	8	22.2
BLIS/BSc	21	58.3
MLIS/MSc	4	11.1
PhD	0	0
Total	36	100.0

The tables 6 above has revealed that majority of the staff in these libraries are Bachelor degree holders with 21 frequency and representing 58.3% of the staff population in all the libraries studied, Diploma is the second highest qualification among the respondents with frequency of 8 and % of 22.2, Master degree has 4 frequency occurrence which represents 11.1% of the population, SSCE which is the least educational qualification has frequency of 3 which also represent 8.3%, while none of the libraries studied has a PhD holder in their ICT departments.

General Technological Skills of Staff in the Library Studied to Work in Digital Library Environment

One of the major objectives of this study was to determine the technological skills available for the management of electronic local content in the libraries under study, to ascertain this, the researcher sought to know the general technological skills required to work in an ideal digital library.

Table 7 General Technological Skills to Work in Digital Library Environment

General Technological Skills to Work in Digital Library Environment	Yes	
	Freq.	%
E-mail management skills	32	88.9
Microsoft word (Word Processing Skills)	34	94.4
Microsoft Access (Database management skills)	22	61.1
Microsoft Excel (SpreadSheet Skills)	26	72.2
Power point (presentation software)	24	66.7
Use of Portable Document Format (PDF) Software	30	83.3
Web Searching Skills	30	83.3
Use of Digital Camera for Digitization	11	30.6
Web navigation Skills	25	69.4
File management/operating system navigation skills	22	61.1
Troubleshooting technology	20	55.6
CD-ROM/DVD Search	27	75.0
Scanners and similar devices	24	66.7
Installing software	16	44.4
Web design	6	16.7
Computer security knowledge	5	13.9
Installing Printer, scanner and other peripherals	19	52.8
Graphic Design	13	36.1
Network management	14	38.9
Computer programming	11	30.6

Table 7 above has showed the responses of the respondents on the general technological skills to work in digital library environment in the libraries studied. It was discovered that viruses e-mail management skills, Microsoft word (word processing skills), microsoft access (database management skills), Microsoft excel (spreadsheets skills), power point (presentation software), use of portable document format (PDF) software, web searching skills, web navigation skills, file management/operating system navigation skills,

CD-ROMs/DVDs search, scanners and similar devices, are the most occurring technological skills to work in digital library environment with over 60% respondent rate among the staff of ICT in the libraries studied while use of digital camera for digitization, troubleshooting technology, installing software, web design, computer security knowledge, installing printer, scanner and other peripherals, graphic design, network management, and computer programming are the less occurring skills with less than 60%.

Specific Software Skills for Managing Institutional Digital Repository among the Libraries Studied

Proper management of electronic local content in any library requires some specific software skills. Therefore, in order to identify those software skills the researcher presented a list to be chosen by the respondents as depicted in the Table 8 below.

File Format Used to Collect Digital Local Content in the Libraries Studied

The file format used to create and store digital local content plays a vital role in management of digital local content. Hence, the research sought to find out the file formats used to create and manage digital local content in the libraries studied. The responses are presented in Table 8 below.

Table 8 File Format Used to Collect Digital Local Content in the Libraries

File Formats	NASU Library	UNI ILORIN Library	FUT MINA Library	BENSU Library	ABU Library
MS Word	√	√	√	√	√
Adobe PDF	√	√	√	√	√
PDF/4	X	X	X	X	X
XML	X	X	X	X	X
ASCII	X	X	X	X	X
Open File Format	X	X	X	X	X

Key: X = Not Applicable √ = Applicable

Adobe PDF and MS Word file format was the most popular file format used to collect digital local content by the libraries as indicated on Table 8 The finding corroborates with Borghoff et al (2016) position that PDF and TIFF are the de facto standards for digital documents. Also the data collected show that PDF/4, XML, ASCII and Open Office file format are the file formats not used to collect digital local content in the sampled libraries. The choice of PDF and Microsoft office as the file format for collecting digital local content is purely based on popularity and usage of the two application packages. However, despite the proven quality of PDF/4 in long term preservation of information resources, all the libraries studied reported its non-usage in managing their digital resources.

Providing Access to Digital Local Content in the Libraries in North Central Nigeria

There is available research outputs aimed at addressing issues endemic to the region among the libraries studied, which should be given wide circulation so that the results of the research can be applied in addressing the issues that they sought to tackle. However, to achieve this it is expected that the library should put such research works online. The Table 9 below is aimed at finding the level of provision of such digital local content in libraries studied.

Table 9 Providing Access to Digital Local Content in the Libraries

Access to Digital Local Content	NASU Library	UNI ILORIN Library	FUT MINA Library	BENSU Library	ABU Library

Online	X	X	X	X		X
Nearline	X	X	X	X	X	
Offline	√	√	√	√	√	

Key: X = Not Applicable √ = Applicable

Table 9 above showed that all the libraries studied provide access to the electronic local content offline which means must visit the library personally to access the local digital content. However, this implies that the libraries studied could not provide remote access to this increasingly copious amount of intellectual product at own disposal which, by implication, affects research across the globe

Preservation Strategy or Combination of Strategies Used by Libraries under Study for Management of Digital Local Content

Electronic local content preservation strategies are methods used for keeping stored digital objects permanently accessible for long-term re-use. The strategies adopted by libraries studied depend largely on the file format used and infrastructures available. However, more than one strategy can be adopted by libraries. The researcher sought to find out the strategies adopted by the libraries studied. The findings are captured in Table 10.

Table 10 Preservation Strategy or Combination of Strategies Used by Libraries for Management of Digital Local Content

Preservation Strategies	NASU Library	UNI ILORIN Library	FUT MINA Library	BENSU Library	ABU Library
Refreshing	√	√	√	√	√
Technology preservation	X	X	X	X	X
Normalization	√	√	√	√	√
Migration	√	√	√	√	√
Emulation	X	X	X	X	X
Encapsulation	X	X	X	X	X
Universal Virtual Computer	X	X	X	X	X
LOCKSS	X	X	X	X	X

Key: X = Not Applicable √ = Applicable

Table 10 shows that refreshing, normalization and migration are the only digital preservation activities carried out for the management of electronic local content while none uses any of emulation, encapsulation, universal virtual computer, LOCKSS, open archival information system (OAIS) and technology preservation in libraries in northeastern Nigeria. The table further reveals the poor exploitation of the must digital preservation strategies, which further puts the digital local contents in these libraries at risk of loss.

Provision of Internet Connectivity in Libraries in Northeast Nigeria

The objective of this question was to determine the extent of network connectivity in the libraries. In order to achieve this, the researcher first attempted to identify the types of networks usually found in libraries.

To do this, a list of types of network was provided for the respondents to tick as appropriate as shown in Table 11 below.

Table 11 Provision of Internet Connectivity in the Libraries

Connectivity	NASU Library	UNI ILORIN Library	FUT MINA Library	BENSU Library	ABU Library
Internet	√	√	√	√	√

Key: X = Not Applicable √ = Applicable

Based on the findings revealed in Table 10 above, it is very clear that there is internet connectivity in all the libraries studied. However, it is apparent to note that with level of internet connectivity, implementation of institutional digital repository for the management of electronic local content is feasible in the libraries studied.

Table 12 Specific Software Skills for Managing Institutional Digital Repository

Specific Software Skills for Managing Institutional Digital Repository	Yes	
	Freq.	%
Unix	2	5.6
Linux	6	16.7
SQL Server	8	22.2
MySQL	12	33.3
SGML	2	5.6
XML	8	22.2
PHP	8	22.2
JAVA	12	33.3
PERL	3	8.3
Apache	3	8.3

Table 12 above has depicted the responses of the respondents on the extent of ICT staff acquaintance with specific software skills for managing institutional digital repository among the libraries studied. An observation of the Table revealed that JAVA and MySQL scored the highest with 33.3% each. Next to them are XML, SQL Server and PHP with frequency percentage of 22.2 each also. While both PERL and Apache had a frequency percentage of 8.3% each, However, the least among them is SGML with 5.6% response rate. The Table represents a very poor knowledge about the software skills for the management of electronic local content by the subjects studied, based on Robinson (2019) who asserts that familiarity with Unix, Linux, SQL Server, MySQL, SGML, XML, PHP, JAVA, PERL, Apache is important to effectively manage a digital library software/institutional repository standard web-based software systems.

ICT Staff Acquaintance with Different Repository Software

Management of digital information resources requires not only computer hardware but also appropriate software that will ensure proper organization, accessibility, storage and preservation, however in a an attempt to ascertain the level of familiarity with repository software of the subjects the researcher itemize a list of some popular repository management software as presented in table 13 below.

Table 13 ICT Staff Acquaintance with Different Repository Software

Level of Familiarity with Different Repository Software	Yes	
	Freq.	%
EPrints	0	0
Dspace	9	25.0
Fedora	0	0
OPUS	0	0
Digital Commons	0	0

Alarmingly, Table 13 above indicated that none of the respondents is familiar with any of EPrints, Fedora, OPUS and Digital Commons while only 25.0% are familiar with Dspace. This implies that there is acute shortage of technical skills for the deployment of repository software to manage electronic local content in these libraries.

ICT Staff Acquaintance with Metadata Standards for Management of Electronic Local Content among the ICT Staff of the Libraries Studied

Table 14 ICT Staff Acquaintance with Metadata Standards

Metadata Standards	Yes	
	Freq.	%
Dublin Core	8	22.2
MARC	9	25.0
METS	0	0
MODS	0	0
OAI-PMH	0	0
OAI-ORE	0	0

Critical examination of Table 14 above shows that MARC is the most known metadata standard among the responds with 25.0% response rate, followed by Dublin Core with 22.2%, while none of the respondents are familiar with any of METS, MODS, OAI-PMH OAI-ORE metadata standards.

Mode of Acquiring Relevant ICT Skills for Managing Digital Local Content among the Libraries Studied

Training is the cornerstone of any effort to retool library staff to meet the challenges and opportunities of a digital work environment. Tannent (2015) posits that training can take many forms, and each library should use the mix of training strategies that best meets their need. However, based on this assertion a list of different mode training was provided to the respondents by the researcher as presented in Table 15 below.

Table 15 Mode of Acquiring ICT Skills

Mode of Acquiring ICT skills	Yes	
	Freq.	%
In-house (within the library)	3	8.3
Self-Development	29	80.6
NLA/LRCN training and workshops	10	27.8
NGO (eILF-Net, etc)	2	5.6
International Organization (MCAuthur, Carnegie, etc)	7	19.4
Professional course programme (within Nigeria)	8	22.2
Foreign workshops and Training programmes	3	8.3

The table 15 above revealed that 80.6% of the respondents acquired their ICT skills through self-development, 27.8% through NLA/LRCN training and workshops, 22.2% through Professional course programme (within Nigeria), 19.4% International Organization (MCAuthur, Carnegie, etc), 5.6 % through NGO (eILF-Net, etc) while both in-house (within the library) and foreign workshops and training programmes scored 8.3%. This has revealed the lack of internal training for librarians in Nigerian University Libraries.

Discussion of Findings

It has been observed by the researcher during participatory observation that the level of computerisation in the university libraries in North Central Nigeria is still at infancy level with emphasis on internet connectivity within the library and implementation of automation of library services and routines. Serious computerisation project such as digitisation of local content for global visibility is not embarked upon at all. It was also revealed during the observation session that migration of the digital local content in the university libraries studied was limited to transfer of digital local content from one computer hardware to a more recent computer hardware. The implication of this is that a lot needs to be done for effective institutional digital repository for the management of electronic local content in these libraries.

Findings

Based on the data collected and analysed for the research, the following are the major findings of the study:-

1. Theses and dissertations, multimedia and audio-visual materials, post-print journal articles, books (sections and chapters) are the major electronic local contents available in the university libraries in North Central Nigeria while pre-print journal articles, unpublished reports & working papers, datasets, content-packaged learning objects, software and patents are totally lacking.
2. Majority of the libraries acquire electronic local content through donations and deposition from staff and students while acquisition through solicitation was found to be very poor among the libraries studied.
3. Adobe PDF and MS Word file format were the most popular file format used to digitize local contents. The digital local content created in different file formats were converted to PDF and MS Word file formats for storage.
4. The findings discovered that all the libraries studied provide access to their electronic local content through offline mode only.
5. CD-RW and hard drive are the most popular storage media used to store electronic local content in the libraries studied.
6. Refreshing, normalization and migration were found to be the most popular preservation strategies used in the Libraries in North Central Nigeria.
7. All libraries in North Central Nigeria have server computer, external HDD, CD-RW and desktop computers while none of the libraries studied memory stick.
8. The researcher also found that there is acute shortage of ICT skills required for the management of digital local content among the library staff in North Central Nigeria.

Conclusion

Arising from the findings of the study, it is clear that there are electronic local content in the libraries studied that need to be made available for usage. However, in the same vain it could be concluded that there are problems militating against the non-adoption of institutional digital repository among the university libraries in North Central Nigeria. Hence, the needs for a workable institutional repository plan for these libraries that will address the deficiencies identified by this study.

Recommendations

Based on the findings of this study and the conclusion reached, the following recommendations are made.

1. In view of the importance and relevancy of IDR, University Libraries in North Central Nigeria should be determined and demonstrate willingness in the implementation of Institutional Digital Repository for the management of electronic local content.
2. Rather than the current haphazard management of electronic local content in the libraries, the research recommends full adoption of Institutional Digital Repository in the libraries studied.
3. Adequate hardware and software facilities for the adoption of Institutional Digital Repository should be made available by the libraries studied.
4. Capacity building is crucial to the success of implementing any ICT project. Therefore, it is recommended that ICT staff in the libraries should be routinely trained in the area of relevant skills on hardware and software for the adoption of Institutional Digital Repository should be intensified.

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CHAPTER EIGHTEEN

THE IMPACT OF INFORMATION TECHNOLOGY IN DESSEMINATION OF INFORMATION RESOURCES IN LEGACY UNIVERSITY LIBRARY, THE GAMBIA

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Abstract

This study investigated the impact of Information and Communication Technology (ICT) on dissemination of information in Legacy University library, Gambia (LUGA). The target of the study was to understand the extent of use of ICT in dissemination of information in Legacy University library. Survey research method was adopted and three research questions were formulated to guide the study on the types of ICT facilities, library operations and routines where ICT facilities are applied and the challenges faced in the use of ICT. Data relevant to the study was collected using questionnaire, and a design sampling technique. A total of 100 copies of questionnaire were distributed out of which some could net be retrieved. Data were analyzed using percentages and mean scores. Findings reveal that the ICT facilities that are been used for dissemination of information are; computers, digital multimedia, television, radio and internet. Computer and Internet facilities are used effective for the dissemination while electronic notice board is not used effectively in the dissemination of information. Cataloguing/classification and selection of library resources were the most ICT facilities application in library operations and routines, communication with staff, marketing of library information products and services are the least library operations and routines where ICT facilities are applied in the dissemination of information resources. The major challenges faced with ICT in the dissemination of information includes inadequate ICT skills, poor infrastructures, irregular power supply, inadequate facilities to support the full application of ICT, occasional system failure, inadequate staff training opportunities. Recommendations and suggestion on areas for further development on ICT facilities in the dissemination of information were also made. In view of the importance of current and relevant information resources in any library and the trend of digital environment, Legacy University, The

Gambia library should acquire and provide more various types of information technology so that their customers' needs in dissemination of information can be met at all time.

Keywords: Impact, ICT, Dissemination, Information, Academic Library, Technology

18.1 Introduction

With the invention of data and Communication Technology, libraries now use various types of technologies to assist the services they render. Everyday new technological advances affect the way information is handled in libraries and knowledge centres. The impacts of latest technologies are felt by libraries in every aspect. Computing technology, communication technology and mass storage technology are a number of the areas of continuous development that reshape the way libraries are access, retrieve, store, manipulate and disseminate information to users. The tutorial library has been from its inception an integral a part of institutions of upper learning, instead of an appendix or adjunct. Oyedun (2017) defines academic libraries as those libraries that are mainly found in tertiary institutions, they're established to support learning, teaching and research processes. The introduction of varied information communication technology (ICT) trends has led to reorganization, change in work patterns, and demand for brand spanking new skills, job retraining and reclassification positions. Applications of ICT are numerous but mainly it's utilized in converting the prevailing paper-print records within the entire process of storage, retrieval and dissemination. ICT has impacted on every sphere of educational library activity especially within the type of the library collection development strategies, library building and consortia. ICT presents a chance to supply value-added information services and access to a good type of digital based information resources to their clients. Document delivery, interlibrary loan, Audio visual services and customer relations are often provided more efficiently and effectively using ICT, as they provide convenient time, place, cost effectiveness, faster and most-up-to-date dissemination and end users involvement within the library and knowledge services process. The impact of ICT characterized on information services by changes in format, contents and method of production and contents and method of production and delivery of data products.

Information and communication technology may be a new concept that transformed or shaped information storage and retrieval in libraries, business, schools, offices, homes, etc. Libraries, the planet over, are now adopting ICTs to facilitate or enhance the supply of their range of services. Its evolution has caused steady and effective service delivery. Many scholars and authors have given various definition of ICT. Aina (2014) defines ICT as "an omnibus term that encompasses computers and telecommunication technology; it's concern with technology utilized in handling, acquiring, processing, storage and dissemination of information". Lott (2010) mentioned ICT as "a term that encompasses the notion of application of technologies to information handling (i.e. generation, production, processing, storage, retrieval, dissemination etc.). ICT may be a technology that has overtaken information technology (IT) because of its appropriateness and relevance. ICT has also progressively reduced the value of managing information, enabling a private and organizations to undertake information-related task far more efficiently and to introduce innovations in products, processes and organizational structures.

Johnson (2010) posited that, Information and communication technology (ICT) is that the technologies required for information science, especially the utilization of electronic computers and computer software to convert, store, protect, process, transmit and retrieve information from anywhere and anytime. So also technologies like radio and therefore the newer technologies like satellite, mobile phones and internet are sometimes mentioned as ICTs. Again technologies is used for capturing and gathering information including tape, Recorders, digital cameras, scanner etc. technologies for storing information will include diskettes, flash drives, cassettes, CDs, DVDs, Microfilm etc. additionally activities like classification, cataloguing, communication, inter library cooperation and even collection development etc. are often done manually or automated (computerized).

Lucas, (2010) states that, for the library not to become overwhelmed by the consequences of data technologies it's should adopt automated system in library's operations, design and deliver networks suitable for library, provide database access and efficient management of data.

18.2 Statement of the Problem

Library and knowledge resources have grown in terms of size, format and variety. The digital era has seen the emergence of digital information resources in libraries. Similarly, the deregulation of the telecommunication industries has made ICT accessible and available in libraries (Gbaje and Okojie, 2010). Many libraries like Legacy University library, The Gambia (LUGA). University of The Gambia library (UTG). Igbinedion University Okada library (IUO). University of Nigeria Nsukka library (UNN). Ahmadu Bello University library (ABU) i.e. Kashim Ibrahim Library etc., uses ICT to disseminate their information resources, the degree of which is yet to be established, the arrival of ICTs has given librarians a face lift within the organization and dissemination of data in libraries. The method of dissemination of data has become very challenging and sophisticated. So today, physical location of libraries is a smaller amount important as long as the information is accessible and disseminated. Libraries, especially their roles in university development remain very significant. Their tasks are simplified by the utilization of ICT facilities within the acquisition, organization, management, and dissemination of library resources among others. Okiy (2015) asserted that libraries as centres for learning, teaching and research cannot deal with information dissemination through the utilization of traditional methods; where the method of acquisition, processing and organization of data resources may take up to 6 months before the patrons use them.

In line with this, Okiy (2015) acknowledged that lack of functional ICT policy in libraries are factors undermining the impact of ICTs especially the dissemination of data resources. The researcher observed that the objectives and goals of any library are the supply of timely, current and relevant information to the users, and that they find it difficult to return and use the available information resources within the library since internet is there for them to utilize, with the present trend within the world. It's against this background that this study is meant to look at the impact of data and communication technologies within the dissemination of data in Legacy University Library, The Gambia.

18.3 Objectives of the Study

1. To examined the kinds of data technology available for information dissemination in Legacy University library.
2. To determine library operations and routines ICT facilities applied for the dissemination of data in Legacy University library.
3. To ascertain the challenges within the use of data technologies for information dissemination in Legacy University library

18.4 Research Question

1. What are the kinds of data technology available for information dissemination in Legacy University library?
2. Which library operations and routines ICT facilities are applied for the dissemination of data in Legacy University library?
3. What are the challenges within the use of data technologies for information dissemination in Legacy University library?

Literature Review

18.5 ICT Facilities Available in Libraries

The development and availability of Information and Communication Technologies (ICTs) in libraries have increased and broadened the impact of information and brought them to their doorsteps. Their applications in libraries have indeed continued to ease and promote quick and timely access to and transfer of data that's found dispensed around the globe. During this study on the impact of ICTs in dissemination, Nwalo (2015) listed the subsequent ICT facilities utilized in the dissemination of data within the library to include; computers, DVDs, CDs, internet and telephones. deWatteville and Gilbert (2010) noted that the ICT includes; Computer, Internet, camera, Webcam, open-end credit, Scanner, E-Books, Printers, Electronic Journals, WEB-OPAC, Animation, E-Mail, CD-ROM, DVD, RFID Technologies. In this study, the researcher want to examine the types of ICTs utilized in the dissemination of data in Legacy University library.

ICT is applied to the operation of libraries and knowledge centers to make sure that information dissemination is timely, accurate, precise and relevant (Madu, 2012), defined library automation as “the use of computers and associated technology try to revive what has been wiped out of the libraries with the justification of reduced cost and increased performance. Thus, automation helps within the acquisitions, organization, storage and dissemination of data in libraries. In line with this Okore & Ekere (2008) noted that the supply of ICT facilities and therefore the awareness of them by the patrons will go an extended way for tutorial librarian to be relevant to their patrons and be up so far in order that they will manage the ever-growing information needs during this electronic age.

Iwu (2013) in Afolabi and Abidoye (2012) in their study on the mixing of data and communication technology in library operations towards effective library services categorized types of ICTs into the following:

1. Sensing technologies: This equipment gathers information and translate them into a form which will be understood by the computer.
2. Communication Technologies: These include equipment that are provided to enable information to be transferred from a source to user. It also tries to beat natural barriers to information transfer like speed and distance, a number of these include: facsimile machines (fax), telecom system, telephone, electronic message, teleconferencing, electronic bulletin boards, etc.
3. Display technologies: These are output devices that form the interface between sensing, communication and analysing technologies and human user. They include: display screen, printers, television, etc.
4. Analysis technologies: These are the technologies that help within the investigation or query of data, analysis and in-depth query for answers from simple to complex phenomena in research procedures. An entire set of a computing system might be a micro, mini, mainframe or super scamper.
5. Storage Technologies: These devices facilitate the effective storage of information in a form that will be easily accessed. Examples are: magnetic tapes, disks, optical disks cassettes, computer disk drive, library website, etc.

The above view explains that computers, DVDs, CDs, internet and telephone among others, were the type of ICTs available for the dissemination of data in libraries.

18.6 Library Operations and Routines where ICT Facilities are applied

Libraries within the Third World including The Gambia, are gradually but steadily converting from manual to computerized routines. The advantage of the automated or uses of ICT during a library system are both self-evident and overwhelming (Nwalo, 2015). This library operations and routines are the activities the librarians do on day to day, like selection, ordering, cataloguing and classification and dissemination of data resources etc. Also, Okolo (2012) opines that during this age of data era, the library needs ICT so as to offer efficient services to its users. Not only is that the speed of its operation high, the quantity of its output is correspondingly large. When ICT is employed within the library, there's economy of labour and operating expense. In short, its application within the activities of the libraries will enhance their information dissemination and therefore the overall performance of the library services. Maravilla (2008) noted that librarians within the world over are tasked with the responsibility of acquiring, processing, disseminating information to users. Impact of data and communication technology within the dissemination of library resources is the reality of the 21st century. It makes libraries smart and offers many opportunities to enhance services to library patrons, the utilization of data technology, especially, in libraries can't be over-emphasized.

Afolabi and Abidoye, Aderele and Adelokun (2011) listed the subsequent as a number of the ICT facilities or resources that a librarian can use for effective information dissemination in library to the users:

1. Computer: Computer are often mentioned because the backbone; nucleus or hub of ICT application in library operation in virtually all ICT applications; the computer is interfaced with other devices so as to function effectively. Computer on its own are often use to perform the subsequent functions within the library by the library staff; ordering / acquisition, circulation, library information base, inter library loan by two or more libraries that are connected, documentation and administration and publication.

2. Internet Facility: the web is employed by the library staff to speak with their users. It's described as a worldwide network of computers and other people. Built upon state of the art technology, the web makes it possible for thousands of dissimilar physical networks that aren't connected to at least one another which use diverse hardware technologies to attach and operate as one communication system. There are locations of varied types of information on a computing system linked to the web, it's a crucial tool for global on line services, especially, to access the knowledge bases, sending e-mails among others.

3. Video Conferencing: Through video conferencing, people at different locations within the world might be allowed to carry out meetings especially librarians. Nwabueze and Ozioko (2017) described video conferencing as a way of linking up two or more remote computers, all of which have a little camera attached which enables the participants to ascertain one another, to talk to every other and in some systems, to be ready to start, send documents through the linked computer. Some libraries use this medium to source for information that aren't available within its own libraries and at an equivalent time use this great medium to make awareness for users who are unaware of the supply of data resources in the library.

4. Electronic message (e-mail): This medium also can be used to send and receive mails between the library staff and users to send remainders on overdue books. This is often commonly and widely used with the web facilities. E-mail is extremely useful for sending messages to and from remote areas with enhanced network.

5. Networks: this is often a system of interconnected computers for sharing information and resources which will involve two or more computers during a single office or several computers in several units across a corporation or across a rustic. With network, libraries can access and share information in several locations and download for users" needs.

18.7 Competence of Library Staff in Application of ICT Facilities to dissemination of data in Library

Information and Communication Technology application in libraries requires that those that are getting to operate the electronic systems possess a particular level of data and skill to be effective within the expectation of what ICT application has got to offer. Majority of librarians are trained within the traditional methods of librarianship. An insight of this, Morgan (2018) argued thus: in today's world, why would anybody trust a librarian whose profession is about information and knowledge, who had not mastered a computer? This argument explains why we librarians must acquire computer knowledge to be committed to providing ICT-based services. This successively means we'll be failing those whom we serve if we don't acquire ICT skills (Olorunsola, 2017). Information technology is that the language of the 21st century. Thus, librarians got to continuously update their skills to be ready to function maximally in an IT environment.

Librarians have found themselves during a new environment, otherwise referred to as digital environment. The environment is characterized with uncertainties and increasing complexities of digital technology (Nwakama, 2013). Librarians need ICT skills for variety of reasons. The new working environment has become a competitive one and lots of players are now involved in information provision which include, Internet cafe, mobile communication medias, ICT staff, and lots of others within the information profession (Wittmer, 2011). A number of these players especially the web café providers lack the required IT skills to get quality information (Stubbings and McNab, 2011). Librarians are going to be called upon to act as both educators and intermediaries (Sharp, 2012). New services are emerging within the new working environment.

Aschroft and Watts (2015) observed that in Africa, one during a hundred people has access to a private Computer. They added that there's a big skills gap among information professionals in Gambia, which has resulted in serious underutilization of electronic resources in many libraries in Gambia. But it's often improved when librarians in developed economies gain knowledge of latest technologies through continuing educational programmers, professional training, and revision within the library school curricular. Ramzan (2004) noted that the impact of ICT to library processes has help librarians develop appropriate ICT skills. University libraries should focus their attention on applying ICT in their operations to keep step with the developments in both education and ICT round the world (Adeyoyin, 2015).

Librarians are expected to possess these ICT knowledge and skills: OS, packages and programming languages, web awareness, technical skills and knowledge of online services. Warmwin (2018) observed that because computers have assumed such a central role in our profession over the years, we'd like to understand more about them. It's therefore imperative for librarians to possess technical skills and subject knowledge to add value to library services for user. Morgan (2018) considered other skills like elementary programming of one or two languages, project management, and alter management charge. Islam and Islam (2017) also observed that librarians must develop the competencies to hold out effective searches on CD-ROMs, OPAC, on the online and other electronic databases bases. Pairy (2017) outlined the ICT skills of librarians as database management, web development, management of multiple media, meta information skills, knowledge of standards like Z39.50 and Dublin Core.

Levine (2017) listed a number of the ICT skills to incorporate but not limited to data processing skills, spread sheet skills, database skills, electronic presentation skills, web navigation skills, website design skills, e-mail, management skills, Windows Explorer skills, etc., which can enable the library staff to manage the resources.

The use of coaching tools has been found to be effective in training library academic staff. A number of these training tools include in-house training manuals, software programmers, and self-instruction and vendor annuals. Other methods identified by Kirkpatrick (2017) include individual training by co-worker, individual training by other individual, individual training by supervisor, outside workshops, and in-house workshops of these, he found that individual training by co-worker was the foremost commonly used method.

18.8 Challenges of ICT Facilities Application in Libraries

The challenges of ICT facilities application in libraries in African countries relate to acquisition of ICTs, preservation of electronic information resources, maintenance and security issues, training of users, general lack of awareness, commitment among library stakeholders and proper dissemination. Sivakumaren, Geetha & Jeyaprakash (2011) in their study on ICT facilities in university libraries in India found that computers, printers, scanners and photocopiers were most of the facilities used and therefore the impact of ICTs has increased the library functions and users' expectations have increased thanks to development in technologies. Jordan (2013) was of the opinion that barriers to adequate ICT skills training in developing countries arose from both lack of ICT literacy and therefore the incontrovertible fact that many local library schools did not integrate ICTs into their curricular has greatly affected the performance of library staff. Goulding (2010) asserted that teaching departments have a responsibility to support the event of appropriate ICT skills to deliver modern information services, by incorporating new skills requirement into syllabus.

Adeleke and Olorunsola (2010) studied ICT and library operations and located that ICT facilities were the main constraints facing libraries within the use of tools. Shafi-Ullah and Roberts (2010) found that ICT infrastructure is important to supply a search culture in education institutions and recommended allocating funds for ICT infrastructure. Etebu (2010) studied ICT availability and located that thing isn't encouraging. Most of those challenges are to be overcome by both the library management and knowledge providers before they will satisfy the knowledge needs of their numerous users on day to day. The above finding has established that respondents who make use of the ICT resources encounter various problems when sourcing their information. Martel (2013) argued that because technology changes often, roles are grabbed on the fly noting that experts in one piece of software with its related slice of the information world might be obsolete with the release of a new piece of software with a new slice of the world

18.9 Methodology

The survey research method was adopted for the study. This is often due to the various advantages attributed thereto by statisticians and professionals, Muranda (2014) observed that survey research is one among the foremost popular techniques for collecting quantifiable information. Survey may be a type of descriptive research used when handling a really systematic collection of data or information from population or a sample of the population. The population of this study comprises of library and non-Library staff in Legacy University, The Gambia (LUGA). With total number of 498. The below table shows the distribution of the population. Sampling deals with bringing or breaking an outsized population into a constituency unit for straightforward managerial and statistical. Nwena (2011) asserted that if the population of the study isn't large in thousand the share population for the sample should be 20%.

However, Sambo (2015) explained that sampling may be a selection procedure whereby all the subset during a giving population has a civil right or chance of being selected for the study. The sampling techniques would be used for the aim of this study in order that members of the population would be represented disinterestedly. The sample size therefore is 100 hundred (100). This is often 20% of the entire respondent of the study. Questionnaire is the instrument for information collection. The questionnaire was administered to the tutorial staff of Legacy University library and other staff who constantly use the library by the researcher. Information collected for this study was sorted into categories which can be converted into distribution and percentage tables to point out comparison and differences. The share, frequencies generated within the table explain the study, helping to draw a logical conclusion to be drawn and to support the findings obtained.

18.10 Response Rate

Out of the 100 copies of the questionnaire administered to the respondents, a total of 82 (82 %) copies were retrieved and duly completed and found usable for this study. The respondents were allowed to tick as many options that appeal to them.

Table 1: Types of information technology available for information dissemination

Rating Items	Respondent	Percentage
Computers	59	72%
Overhead projectors	3	3.7%
Electronic Notice Board	17	20.7%
Optical Fibres connection	8	9.8%
Digital Multimedia	72	87.8%
Television/Radio	49	59.8%
Video/VCD Machines	54	65.9%
Internet	75	91.5%

Table 1: shows the numbers of respondent that indicated the availability of information technology used for information dissemination. 59(72%) said computer is available, 3(3.7%) posit overhead projector is available, 17(20.7%) said electronic notice board as an information technology is available, 8(9.8%) opine optical fibre connection is available, 72(87.8%) said digital multimedia is available, 49(59.8%) said television /radio is available, 54(65.9%) said video/vcd machines is available while 75(91.5%) express that Internet as an information technology is available for information dissemination. This has shown that Internet, digital multimedia, computers, video/vcd machines and television/radio are the most IT resources used for information dissemination in Legacy University library, The Gambia (LUGA).

Table 2 Perceived Effectiveness of Using Information Technology in the Dissemination of Information in Legacy University library, The Gambia (LUGA)

Rating Items	Respondent	Percentage
Computer	75	91.5%
Overhead Projector	34	41.5%
Electronic Notice Board	20	24.4%
Optical Fibres Connection	12	14.6%
Digital multimedia	75	91.5%
Television/Radio	65	79.3%
Video/VCD Machines	59	72%
Internet	79	96.3%

Table 2 shows the respondent perceived effectiveness of the use of Information Technology in information dissemination. 75(91.5%) said computer is effective, 34(41.5%) posit overhead projector is effective, 20(24.4%) said electronic notice board is effective. 12(14.6%) said optical fibres connection is effective, 75(91.5%) said digital multimedia is effective, 65(79.3%) said television/radio is effective, 59(72%) said video/vcd machines is effective while 79(96.3%) perceived Internet as being an effective information technology in disseminating information in LUGA. This has shown that Internet, computer, digital multimedia, television/radio and video/vcd machines are mostly perceived by staff as effective information technology resources used in information dissemination in Legacy University library, The Gambia (LUGA).

Table 3 Library operations and routines where ICT facilities are applied for dissemination of information

Library operation where ICT facilities are applied	Respondents	Percentage
Acquisition of information resources	64	78%
Processing of information resources	67	81.7%
Retrieval of information resources	81	98.8%
Dissemination of information resources	78	95.1%
Preservation of information resources	53	64.6
Relegation/weeding of information resources	42	51.2%
Serial control	40	48.8%
Inter library loan	56	68.3%
Others	12	14.6%

Table 3 above shows the response of the staff on the library operations where ICT facilities are applied to the dissemination of information resources. It was discovered that retrieval of information resources scored 81 (98.8%); Dissemination of information resources scored 78 (95.1%) and processing of information resources scored 67 (81.7%). This implies that the library staff swift accessibility to the information resources in the library using some of the ICT facilities such as computers and Internet facilities to enhance the dissemination of information resources. The respondents indicated that ICT facilities were less applied in serial control with frequency score of 40 (48.8%) and interlibrary loan with a score of 56 (68.3%).

Table 4 Challenges of Using IT in Dissemination of Information

Rating items	Challenged	Not Challenged	Percentage
Staff Inadequate ICT skills		68	82.9%
Lack of knowledge of how to evaluate the use and role played by ICT in dissemination of information	55	00	67.1%
Insufficient knowledge of appropriate software	61	00	74.4%
Poor infrastructure		65	79.3%
Irregular power supply		67	81.7%
Inadequate facilities to support the use of ICT		59	72%
Lack of fund	45	00	54.9%
Cost of purchasing ICT facilities	55	00	67.1%

Table 4 shows the challenges encountered by staff when using IT in dissemination of information. 68(82.9%) said staff inadequate ICT skills is not a challenge in the dissemination of information resources using Information Technology. 61(74.4%) said there is challenges on insufficient knowledge of appropriate software, lack of fund and cost of purchasing ICT facilities are challenges among 45(54.9%) and 55(67.1%) respondent respectively. The result also shows that those respondents who indicated that has the knowledge but are restrain by certainty on how to evaluate the use and role played by ICT in dissemination of information, insufficient time to make use of the computer and inadequate fund as challenges in using ICTs are 65(79.3%) and 67(81.7%) respectively. Generally, the result shows that greater numbers of library staff in Legacy University, The Gambia are faced with challenges in dealing with ICTs in dissemination of information.

Findings

Findings on descriptive analysis based on the information collected and analyzed for this study, the following are the major findings of the descriptive analysis. It has been established that:

1. The study revealed that ICT facilities like computers, Video/VCD Machines, digital multimedia, television, radio, internet etc. are available for information dissemination in Legacy University library, The Gambia (LUGA).

2. Computers and Internet facilities are the ICT facilities available and used effectively for the dissemination of information resources in Legacy University library, The Gambia (LUGA). Optical Fibres Connection and Electronic Notice Board are not effectively used in the library.
3. Cataloguing/classification and selection of library resources were the most ICT facilities application in library operations and routines. The ICT applications have improved the library staff productivity and facilitated the acquisition of library resources in the library studied. However, communication with staff, marketing of library information products and services are the least library operations and routines where ICT facilities are applied in the dissemination of information resources in the library.
4. The study also revealed that staff in Legacy University library, The Gambia (LUGA) are faced with serious challenges in the utilization of ICTs resources for the dissemination of information. Such challenges includes; inadequate ICT skills, poor infrastructures, irregular power supply, inadequate facilities to support the full application of ICT, occasional system failure, inadequate staff, inadequate staff training opportunities and slow bandwidth (slow Internet connection) etc. Therefore, ICTs have indeed enhanced the library operations and routines and some of these challenges can be reduced to the barest minimum to provide effective and efficient services to the library clienteles.

Conclusion

Based on the findings of this study, it could be concluded that Information and Communication Technologies (ICTs) have facilitated the dissemination of information resources especially the areas of the selection, ordering, acquisition, processing, storage and retrieval of library information resources; have improved staff competences, but have not enhanced users satisfaction and marketing of library and information products and services. Despite the fact that the library is owned and funded by the board of governing council and directors, there are different types of ICT facilities available and used for the dissemination of information resources. However, power outage, system failure, slow Internet connectivity and inadequate staff, and staff training in the development and use of the ICT facilities available are still factors affecting their applications in the dissemination of information resources in Legacy University library, The Gambia (LUGA). The challenges to ICT utilization in the library if not properly handled will reduce their potentials to achieve the goals and objectives of their parent institutions especially through the provision of current and relevant information resources that are necessary to sustain their learning, teaching, research, community services and functions. It is time librarians in collaboration with system librarians; the indigenous computer scientists come together and develop ICT facilities that can meet our environment and many other challenges facing the libraries than depending on foreign ICT facilities especially the ILS.

Recommendations

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

1. In view of the importance of current and relevant information resources in any library and the trend of digital environment, Legacy University library, The Gambia (LUGA) should acquire and provide more various types of information technology so that their customers' needs in dissemination of information can be met at all time

2. Legacy University library, The Gambia (LUGA) should acquire relevant ICT facilities to enhance the dissemination of their information resources.

3. Human capacity building is crucial to the success of ICT utilization and effective service delivery. There is a need, therefore, for the library staff to undergo local and international training on ICT skills and the development of indigenous integrated library software that will meet the Legacy University library, The Gambia (LUGA) needs and also to perform library operation where ICT facilities are applied so as to be creating new innovation to enhance effective and efficient library information services delivery.

4. With some of the long term ICT challenges facing the Legacy University library, The Gambia (LUGA) studied, staff of the university library should be encourage from time to time to undergo seminars and workshop so as to update themselves on ICT skills. The governing council and the board of director of the university should come together to deliberate on how to increase the library

budget to enable them provide and maintain their ICT facilities to cater for poor infrastructure and irregular power supply.

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CHAPTER NINETEEN

OBSTACLES TO ADEQUATE FUNDING OF AGRICULTURAL RESEARCH INSTITUT LIBRARIES IN NIGERIA

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OBSTACLES TO ADEQUATE FUNDING OF AGRICULTURAL RESEARCH INSTITUTE LIBRARIES IN NIGERIA

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Abstract

This study focused on the obstacles to adequate funding of agricultural research institute libraries in Nigeria. All the fifteen (15) Agricultural Research Institute Libraries (ARILs) were sampled in the study; three agricultural research institute libraries were used as the pilot study, while twelve were used in the main study. The survey research method was adopted and the instrument used for data collection was the Questionnaires on Obstacles to Adequate Funding of Agricultural Research Institute Libraries in Nigeria. Solicited responses from the principal officers of ARILs and their librarians who were themselves major users of the libraries. The responses were in line with the two research objectives of the study: Obstacles to adequate funding and services rendered with received funds. The data collected were analyzed using frequency distributions, percentages, mean scores, standard deviation, graphs, tests of differences and relationships to one hypothesis used. PPMC was used to statistically test for the relationship between obstacles of sufficient funding and satisfactory services provision. However, obstacles to adequate funding still exist. The hypothesis was tested at significant level of 0.05. The decision of the hypothesis was rejected at P< 0.05 and retained at alpha level of 0.05 (P> 0.05). For the hypothesis, the observed P-value for the test was 0.000 compared with 0.05 fixed level of significance (P < 0.05). These observations provided enough evidence for rejecting of the null hypothesis. The null hypothesis is that there is no significant relationship between obstacles to sufficient funding and services provided by agricultural research institute libraries in Nigeria as a guide for Assessment of funding and is therefore rejected. Hence the Hypothesis was rejected. The recommendations of the study included10% of total recurrent budgets of ARILs for their libraries, better utilization of allocated funds through enhanced monitoring, statutory recognition of ARIL librarians' i . e . Principal Officers should be made to enforced expenditure of the allocation of funds.

Key Words: Obstacles, Adequacy, Utilization, Assessment, Monitoring, Allocation

19.1 Introduction

Libraries must also facilitate maximum provision of information to their users by giving out and receiving information resources from other libraries. The quality and indeed the quantity of the services provided by the libraries of the agricultural research institutes in Nigeria will provide an adequate assessment of funding of agricultural research institute libraries in Nigeria. Some of the libraries have outdated materials, facilities, equipments and services rendered to their clients are not current as a result of inadequate funding which led to the obstacles of funding the libraries. They ought to also undertake training and re-training and hence, capacity building of staff to meet the current challenges in agro librarianship. If the agricultural research institute libraries in Nigeria are to perform their functions effectively, therefore, they must possess adequate and appropriate information resources for effective services. All these can only be made possible with adequate funding (Tiamiyu, 2010).

There are fifteen agricultural research institutes in Nigeria and they have the following under-listed objectives for their libraries (Ezeala and Yusuff, 2011):

i. To draw the attention of the scientists and other users to the available printed and non- printed information relevant to them in crop and animal production.
ii. To provide relevant current and up-to date information to clients.
iii. To develop close working relationship with individual clients so as to identify with their schedule of work, (working habit and information needs).
iv. Provide library materials in supporting faculties, both external and collaborative research.
v. Provide materials for personal development.

vi. Provide books, journals, pamphlets, magazines, reprints, periodicals and on-line and offline services for instruction, assignments, term papers, theses, dissertations as well as supplementary readings.

vii. Document all available information on crop and animal production in Nigeria.

viii. Set up and manage computer database on crop and animal production research in order to make information retrieval easier.

ix. Serve as a clearing house for crop and animal production research information.

x. Provide selective dissemination of information service (SDI) to the scientists and other users.

xi. Provide outreach programmes to rural communities, informing them about new practices and current developments in crop and livestock production.

xii. Collection of research output on animal production research in Nigeria; data entries of over 3000 research abstracts from twenty Nigerian universities and bio-data on who is who in animal production research in Nigeria.

These objectives could be said to form the nucleus of the services they render to their users. Librarians and information scientists are not only concerned with the acquisition, processing, storage and dissemination of hard information to individuals and organizations for their use, but are also concerned with the manner in which the information provided is put to use in the agricultural research institute libraries (Ezeala and Yusuff, 2011). They have also become concerned with the outcomes in terms of the satisfaction derived by the recipients of the information services in carrying out their several functions (Tiamiyu, 1990). However, this study therefore intends to investigate obstacles to adequate funding and spending of agricultural research institute libraries fund allocation in Nigeria.

19.2 Statement of the Problem

The obstacles that could hinder adequate funding of agricultural research institute libraries in Nigeria is very imperative because the libraries cannot afford to remain underfunded, a situation that could totally paralyze the operations of these agricultural research institute libraries in Nigeria.

The services provided by agricultural research institute libraries in Nigeria (ARILN) and the monetary allocation to the agricultural research institute libraries in Nigeria can no longer meet their demand. The Libraries are generally mandated to serve as sources of information to support teaching and research objectives of members of their immediate communities. This implies that agricultural research institute libraries in Nigeria need to be up-to- date and well organized for smooth and accelerated retrieval of information by scientists and other users. Uganneya, Ape and Ugbagir (2013) observed that the agricultural sector had not been doing well in the recent past and this was partly attributed to the inability of the libraries to provide resources and effective services to researchers and other stakeholders in agricultural institution. This is a problem because today, most researchers in the agricultural research institutes in Nigeria have adapted readily to the widespread availability of digital content, accessible directly from their desktops because their respective libraries can no longer meet their demand (Cullen and Calvert, 2010). Ezeala (2019) supported this observation and opined that:

> *This scenario has brought about a sharp fall over the past five years in the number of researchers who visit and utilize their institution's library regularly. The researchers prefer to access digital information from their desktops either from homes or their offices.*

The above scenario might have arisen from inadequate funding. If the non-patronization trend is allowed to continue, the fears of these libraries slipping into redundancy and non- existence, in the next few decades, can be readily appreciated.

19.3 Research Questions

The study provided answers to the following research questions:

1. What are the obstacles to adequate funding of agricultural research institute libraries in Nigeria?

2. What are the services provided by agricultural research institute libraries in Nigeria with the funds received, as a guide to the assessment of funding?

19.4 Objectives of the Study

This research study aim at achieving the under listed objectives:

1. To determine the obstacles to sufficient funding of agricultural research institute libraries in Nigeria.
2. To find out the services provided by the agricultural research institute libraries with the funds received, as a guide to assessment of funding.

Hypothesis

The below hypothesis was tested for the study.

1. There is no significant relationship between obstacles to sufficient funding and services provided with received funds by agricultural research institute libraries in Nigeria as a guide for assessment of funding.

Literature Review

19.5 Obstacles to Adequate Funding of Agricultural Research Institute Libraries in Nigeria

The obstacles to adequate funding of agricultural research institutes libraries in Nigeria cannot be over emphasized. According to Esievo (2015) there is no doubt that drug problem is not new in Southwest Virginia, but lack of funding for effective, long-term treatment has hurt efforts to curb the agricultural epidemic. Nigerians are lacking in funding for treatment, related to agricultural research institute libraries in Nigeria, scientists and other stakeholders of the libraries needs current and updated information services for their research work but due to underfunding of these libraries, effective and efficient services are not rendered as expected by the libraries.

Ubogu and Okiy (2011) reported that the obstacles to alternative sources of funding are librarian's attitude, inadequate philanthropic culture of Nigerian citizens, Azubogu (2019) identified the obstacles affecting funding of research institute libraries to include: inadequate management of funds released, insensitivity on part of government, lack of public-private partnership, librarians' attitude, appointment of non-librarians as board members and inadequate attention by their management. It is therefore envisaged that, a policy that allows for the institute librarians to be part of management, may reduce management - induced obstacles to funding of agricultural research institute libraries in Nigeria.

Discrepancies and delays in the Budget process can also be obstacles to funding of agricultural research institute libraries in Nigeria. Gbolagade and Aliyu (2011) stressed that the habitual late completion of budget proposals between the National Assembly and Presidency, causes both funding approvals and disbursements to be late and often leads to conflict in the budget process. Delays have significant impact on the conduct of research, especially in terms of the period, such as seasonal farm operations and this can impact on the services of agricultural research institute libraries in Nigeria to scientists and other stakeholders. Planned

Activities spill over, into the next year as a matter of necessity. Delays in the budget process regularly cause fourth quarter disbursements to occur as late as the end of December necessitating an extension until March of the following year, which may result in inflation, thereby causing service providers to resort to over pricing and later, account for inflation and interest. Research libraries suffer from the above obstacle which eventually affect the activities of the library and automatically reflect on the services the library renders to its immediate communities (Gbolagade and Aliyu, 2011).

The allocations that are finally approved are usually based on priorities, lobby groups and personal relationships with the ministry, Budget Office and National Assembly. According to Ifidon and Okoli (2012), there is no separate budget for the libraries to spend when budgets for the institutions are approved and there is lack of uniform policy of funding for libraries, this may still be the case today. They also identified the obstacle of global economic depression and inflation, devaluation of local currency and lack of

relationship between annual subventions and estimates. Apparently budgetary delay due to National Assembly and presidency impasse is another obstacle that is difficult to handle, as agricultural research institutes management have to wait.

Another obstacle to poor funding of agricultural research institute libraries in Nigeria is that monitoring and evaluation activities should be conducted prior to the quarterly disbursement of funds, but overlapping delays make this entirely impracticable from an operational perspective. The lack of a culture which supports monitoring and evaluation further compounds this challenge. Given the dearth of qualified specialists, monitoring and evaluations are often reduced to mere field visits. As a result, the budget process is less transparent than desired and fraught by mismanagement (Ubongu and Okiy, 2011).

Obstacles to funding of research institute libraries have not really been considered by their librarians. There is no forum where agricultural research institute libraries in Nigeria can come together to discuss problems that are biting hard on services provision. This is why efforts to reduce these problems to the barest minimum have not been put in place by the librarians and stakeholders. It is imperative for these obstacles to be identified so that the librarians will be able to situate agricultural research institute libraries in a vantage position to function optimally.

These obstacles to funding agricultural research institute libraries in Nigeria have greatly affected their competence in providing the desired materials and services to researchers. Hence, agricultural research institute librarians in Nigeria have to be proactive in finding solution to problems affecting funding, if they are to be relevant in their institutions.

19.6 Provision Services, as a Guide to Assessment of Funding

According to Grilfith (2016) services in the libraries are library processes and activities carried out with the aim of disseminating desirable information to library users. Services to users in the broadest sense include, all library functions since the ultimate aim of any library activity is the satisfaction of users' information needs. The library and information community have provided a range of services which facilitate the inter-change of library data, promote the inter-cooperation of library systems and support the operation of national and international networking of research libraries. Also, the Australian Library Association (2016) noted these services to include: reference service, current awareness services, circulation services, selective dissemination of information services, Internet services, inter-library loan services, photocopy services and so forth. Udekwe (2017) opined that agricultural research institute libraries also provide the following services: Access to Global Online Research in Agriculture (AGORA), Gender Agricultural Research Database (GARD), Crop Varieties Data Base (GROVAD), Media Services, Online Public Access Catalogue (OPAC) and Extension and Outreach Services Majority of these, are now considered as resources.

Agricultural research institute library services in this study, imply and include, from a global perspective, services provided from Internet, online and offline data base, Video Compact Disc (VCD), Digital Video Disc (DVD), flash drive, scanners, digital camera, software and print information resources (Mamman and Adejumo, 2012). Services, therefore, involve the use of the information resources to satisfy users' needs through the medium of Current Awareness Services (CAS), selective dissemination of information (SDI), Bibliographic services, inter- library loans, online services, outreach programmes, facilitating and promoting reading clubs, developing programmes for library users, managing access to electronic information resources, building collections to respond to changing community needs or demands, creating pathfinders, answering incoming reference questions via telephone, portal mail, e-mail, fax and chat, cataloguing and classification, circulation, publishing, media-services, digitization, interactive searching, Internet services and so forth. This must facilitate maximum provision of information to their users, the agricultural research institute scientists and other stakeholders, by giving out and receiving information resources from other libraries. Also inclusive are training and re-training of library staff, hence capacity building to meet the current challenges in librarianship. Computers have become part and parcel of the library networks and the society in general and are being included as integral components of services in agricultural research institute libraries in Nigeria (Fabunmi et al., 2016). The quantities and indeed the qualities of the above enumerated resources and services in any library are guided by the adequacy of the funding of such a library and hence their existence is a good assessment of funding to such a library. The libraries exist for the sake of rendering these services,

the emphasis however, shouldn't just be on the services the libraries rendered, but also on how rendering these services translate into satisfaction on the part of the user of the library. This is hinged on the conception that services delivery must meet satisfaction at one point or the other.

19.7 Services Provided by Agricultural Research Institute Libraries in Nigeria as a guide for Assessment of funding

Mwila (2013) stated that the library is considered as an integral composition of any efficient research system. It plays a vital role in the improvement of scientific and technological research and the acceleration of the innovation process. An understanding of the information needs, as well as the ways agricultural scientists and other users use their libraries is crucial to effectively meeting their information needs. Service is the major function of agricultural research institute library. Adesiji and Komolafe examined sources of funds for Technology generating activities and compared agro-technology generating practices and identified constraining factors hindering technology generating practices as poor access to knowledge and information on new innovation for Universities and limited physical resources, like Information Communication Technology (ICT), Telephone, for research institutes, respectively. However, the study excluded agricultural research institutes and was limited to North central Zone. For a service to be rendered there must be a recipient who should be ready to appreciate such. However, this may not be possible if the service is not rendered properly. This also is applicable to library services. Any agricultural research institute library that has up to 70% of the under listed services serve as a guide or standard for adequate funding of the library. The services provided in agricultural research institute libraries are such that should be useful to the administration of every user (scientists) and others, but the obstacles to adequate funding of agricultural research institute libraries in Nigeria did not allow the 70% achievement.

19.8 Research Method

The research method adopted for this study was survey research method, which is quantitative research method. Descriptive survey was used to collects numerical data from respondents using questionnaires to be subjected to statistical analysis. Survey was appropriate and capable for this study because it deals with all of the respondents for this study. According to Busha and Harter (2010), this method aims at bringing out similarities and differences, highlighted in order to arrive at valid generalization on the study. Survey method has the advantage of saving time, money, nature of question, nature of group to whom the question(s) are addressed, convenience to subject as well as ensuring efficiency.

19.9 Population of the Study

The population of the study comprised of all the six (6) Principal Officers of the agricultural research institutes and the heads of their libraries in the fifteen agricultural research institutes. That is, a total population of one hundred and five (105) respondents, see Table 1 for the breakdown of the population of the study. The respondents are the Executive Directors, Directors, Deputy Directors, Institute Secretaries, Finance Officers, Auditors and Heads of Libraries of all the agricultural research institutes under study. The Executive Director rose through the rank of Assistant Research Fellow to Research Fellow II to Research Fellow I to Senior Research Fellow to Principal Research Fellow to Research Professor, using the library all through and being the chief financier, and also the chief user of the library. Although some Executive Director undertake in service training on their own accord to obtained Ph.D. while still serving as Chief Executive.

The major users and beneficiaries of the agricultural research institute libraries in Nigeria are the undergraduate and postgraduate students. Four of these NARIs are affiliated to Universities, thirteen NARIs are very far away from campuses, making it very uncommon to allow patronage of the libraries by undergraduates students. These libraries are: Institute for Agricultural Research (IAR), Zaria; National Veterinary Research Institute (NVRI), Vom - Jos; Nigerian Institute for Oil Palm Research (NIFOR), Benin-City; Institute of Agricultural Research and Training (IAR &T), Ibadan; Lake Chad Research

Institute (LCRI), Maiduguri; Rubber Research Institute of Nigeria (RRIN), Benin-City; Cocoa Research Institute of Nigeria (CRIN), Ibadan; National Institute for Freshwater Fisheries Research (NIFFR), New Bussa; National Agricultural Extension and Research Liaison Services (NAERLS), Zaria; National Animal Production Research Institute (NAPRI), Zaria; National Institute for Horticultural Research (NIHORT), Ibadan; National Institute for Oceanography and Marine Research (NIOMR), Lagos; National Cereals Research Institute (NCRI), Badeggi; National Root Crops Research Institute (NRCRI), Umudike and Nigerian Stored Products Research Institute (NSPRI), Ilorin.

Table 1 shows the breakdown of the population of the study.

Table 1: Breakdown of the Study Population (Nigerian Agricultural Research Institutes and their Libraries)

S/No	Institutes (NARIs)	Principal Officers of NARIs	Heads of Libraries of NARILs	Total Population
1.	Institute for Agricultural Research (IAR), Zaria.	6	1	7
2.	National Veterinary Research Institute (NVRI), Vom.	6	1	7
3.	Nigerian Institute for Oil Palm Research (NIFOR), Benin City.	6	1	7
4.	Institute of Agricultural Research and Training (IAR&T), Ibadan.	6	1	7
5.	Lake Chad Research Institute (LCRI) Maiduguri	6	1	7
6.	Rubber Research Institute of Nigeria (RRIN), Benin City.	6	1	7
7.	Cocoa Research Institute of Nigeria (CRIN), Ibadan	6	1	7
8.	National Institute for Freshwater Fisheries Research (NIFFR), New Bussa.	6	1	7
9.	National Agricultural Extension and Research liaison services (NAERLS), Zaria.	6	1	7
10.	National Animal Production Research Institute (NAPRI), Zaria.	6	1	7
11.	National Institute for Horticultural Research (NIHORT), Ibadan.	6	1	7
12.	National Institute for Oceanography and Marine Research (NIOMR), Lagos.	6	1	7
13.	National Cereals Research Institute (NCRI), Badeggi.	6	1	7
14.	National Roots Crops Research Institute (NRCRI), Umudike.	6	1	7

15.	Nigerian Stored Products Research Institute (NSPRI), Ilorin.	6	1	7
	Total	**90**	**15**	**105**

NARIs= Nigerian Agricultural Research Institutes

NARILs= Nigerian Agricultural Research Institute Libraries

Source: Agricultural Research Council of Nigeria, 2010.

Table 1, shows that there were six (6) principal officials in each of the fifteen (15) agricultural research institutes summed up to the total of 90 principal officers. Also the table shows one (1) head of library in each of the fifteen (15) agricultural research institute libraries summed up to fifteen (15) heads of libraries. When these are added together, it gives a total of 105 as indicated in Table 1

19.10 Sample Size and Sampling Procedure

For this study, a total of twelve (12) out of the fifteen (15) agricultural research institute in Nigeria were used. This researcher earlier used three (3) of them, which were selected at random for pilot study hence they were not part of the main study. The researcher used all the remaining twelve (12) Institutes for the study. This is in line with Tuckman (2010) who said that "the whole population of a universe would give more weight to the study population that is too small". To draw the sample of respondents, purposive sampling technique was adopted to select six (6) principal officers, and one (1) head of library in each of the twelve institutes. This method is supported by Ejifugha (2018) that purposive sampling is a sample selected by a researcher based on his/her judgment of what is suitable or not suitable for the study; or who should be selected for the study. Thus, in all, eighty-four (84) respondents were selected from the twelve (12) agricultural research institutes for this study.

Table 2 shows the breakdown of the sample of the population. Table 2: Breakdown of the Study Sample size used (Nigerian Agricultural Research Institutes and their Libraries)

S/No	Institutes (NARIs)	Principal Officers of NARIs	Heads of Libraries of NARILs	Total Sample
1	Lake Chad Research Institute, Maiduguri	6	1	7
2	Institute for Agricultural Research, Zaria	6	1	7
3	National Agricultural Extension Research Liaison Services, Zaria	6	1	7
4	Oceanography and Marine Research, Lagos	6	1	7
5	National Institute for Horticultural Research, Ibadan	6	1	7
6	Institute of Agricultural Research and Training, Ibadan	6	1	7
7	Nigerian Stored Products Research Institute, Ilorin	6	1	7

8	National Institute for Freshwater Fishery Research, New Bussa	6	1	7
9	National Animal Production Research Institute, Shika	6	1	7
10	National Veterinary Research Institute, Vom	6	1	7
11	Cocoa Research Institute of Nigeria, Ibadan	6	1	7
12	Rubber Research Institute, Benin City	6	1	7
Total		**72**	**12**	**84**

Source: Field Survey, 2016

19.11 Instrument for Data Collection

The main instrument that was used to collect data for this study was self-developed questionnaire. This was because it was the only instrument that could be used to elicit responses from respondents that cover a wide geographical location in terms of time and fund. It was also the most suitable instrument for generating data in survey study. This is in line with Busha and Harter (2010) who identified three common data collection instruments that are often used in survey research. These are questionnaire, personal interview and observation. For this study only questionnaire was used to collect data. Therefore, questionnaires were drawn to provide alternative answers to questions that were asked from the questionnaires. The most applicable was chosen by the respondents. The same type of questionnaire was produced for the fifteen agricultural research institutes and their libraries in Nigeria.

Questionnaire

One set of questionnaire was constructed and administered to all the agricultural research institute libraries in Nigeria. The questionnaire were mainly closed-ended with instructions which enabled the respondents to answer the right questions on assessment of funding of agricultural research institute libraries in Nigeria. The questionnaire collected (data) on obstacles to adequate funding of agricultural research institute libraries in Nigeria and the data collected on services provided by the agricultural research institute libraries in Nigeria with funds received are used as a guide to the assessment of funding. Five (5) points likert rating scale structured questionnaire were used for this study because likert scale elicit responses on opinion, feelings, attitude and values.

Validation of the Instrument

The designed instrument was subjected to validation to determine whether the content met the objective for which it was designed. For the purpose of this study, face and content validity approach was used by subjecting the instrument to professionals in Library Sciences for vetting. Researchers, supervisors and statisticians from Faculty of Education, Ahmadu Bello University, Zaria, securitize the items (questionnaire) and made necessary corrections and comments to establish face and content validity. According to Spiegel, content and face validity of a survey instrument of this nature is considered sufficient to validate its purpose. The instrument was therefore considered suitable for the study.

Pilot Study (Test)

The designed instrument was subjected to a pilot in order to determine its reliability for the main study. A total of 18 Principal Officers and 3 Heads of libraries from three Institutes (Nigerian Institute for Oil Palm Research (NIFOR), Benin - City; National Cereals Research Institute (NCRI), Badeggi and National Roots Crops Research Institute (NRCRI), Umudike) were administered with the instrument for the pilot study. The researcher administered twenty-one (21) copies of questionnaire for ten (10) days. Only 18 out of the 21 administered questionnaire were returned mainly due to administrative procedure. These 18 represent 85.7% as the response rate of the total administered and were therefore subjected to analyses for the pilot study. Data collected were coded and submitted for reliability and internal consistency test. The Statistical Package for the Social Sciences (version 17) was used for the determination of the reliability and item consistency index. From the available options in The SPSS package, the Guttman Split-Half procedure for computing reliability Coefficient was selected (Levine & Lezotte, 2015).

19.12 Result of Pilot Study and Reliability of the Instruments

The result of the test revealed a reliability coefficient obtained with the Guttman Split- Half Coefficient computed to be 0.80. The internal consistency index obtained with average measure for intra class correlation was 0.93. These observed coefficients are approximately equal to one and therefore consistent with Spiegel (2012).The designed instrument could be said to be not only valid but reliable and internally consistent for this study and studies of similar nature. Analysis of the reliability is presented in Table 3**.**

Table 3: All variables Case Processing Summary

		N	%
Cases	Valid	17	94.4
	Excluded(a)	1	5.6
	Total	18	100.0

A Listwise deletion based on all variables in the procedure.

Table 4: Guttman Split-Half Coefficient Reliability Statistics Result

Cronbach's Alpha	Part 1	Value	.783
		N of Items	49(a)
	Part 2	Value	.929
		N of Items	48(b)
	Total N of Items		97
Correlation Between Forms			.771

Spearman-Brown Coefficient	Equal Length	.871
	Unequal Length	
Guttman Split-Half Coefficient		.804

Table 5: Intraclass Correlation Coefficient

	Intraclass Correlation (a)	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df 1	df 2	Sig
Single Measures	.127(b)	.070	.260	15.103	16.0	1536	.000
Average Measures	.934(c)	.880	.971	15.103	16.0	1536	.000

Procedure for Collecting Data

An introductory letter was collected from the Head of Department of Library and Information Science, Ahmadu Bello University, Zaria which was used to introduce the researchers during data collection.

The copies of questionnaire were administered personally (face to face delivery method) by the researchers to all the respondents except the ones sent to Lake Chad Research Institute, Maiduguri by a lecturer of the University of Maiduguri, Maiduguri. The completed copies of questionnaire were collected instantly on the spot. The exercise lasted for six (6) weeks. This was done to ensure safety of the questionnaire against loss or mutilation.

Procedure for Data Analysis

To answer the stated research question one to two in the analysis, a benchmark weighted mean score of at least 3.0 was considered as agree while those with less than 3.0 as disagree. A benchmark of 3.0 was chosen because it is the midpoint of five point likert scale.

To analyse the data, both descriptive and inferential statistics were used. Descriptive statistics such as frequency distribution, percentages, mean scores, standard deviations and graphs were used to analyze data collected with respect to the research questions raised in the study. For further analysis (inferential statistics), Statistical Package for the Social Sciences (SPSS) was used to analyze the data collected from the respondents, with respect to the hypothesis designed for this study.

The Pearson Product Moment Correlation (PPMC) was used to test hypothesis one which deal with the significant relationships of the groups studied. The PPMC is appropriate because of the quantitative measurement of the variables which was carried out on interval scale. The hypothesis was tested at 0.05 significant level. The decision of the hypothesis was either rejected at $p < 0.05$ or retained at alpha level of 0.05 ($p>0.05$).

19.13 Data Presentation and Analysis

The data collected were statistically analyzed, discussed and presented in this study which form the response rate.

Out of the eighty-four (84) copies of the questionnaire distributed to the respondents, a total of eighty (80) copies were returned completed and found useful for this study. The high response rate was realized because the researchers was able to get some assistance from the Executive Directors, such that most of the respondents completely filled and returned their questionnaire with the exception of some few.

Table 6: presents the total number of copies of questionnaire administered, number returned along with the percentages for each of the institutes covered in the study.

Table 6: Response Rate of the Administered Questionnaires per Institute

S/N	Agricultural Research Institutes in Nigeria involved in the study	Total Number of Questionnaire Administered	Total Number of Questionnaire Returned	Percentage of Total Number of Questionnaire Returned
1	Lake chad Research Institute, Maiduguri	7	7	100
2	Institute for Agricultural Research, Zaria	7	7	100
3	National Agricultural Extension Research Liaison Services, Zaria	7	7	100
4	Oceanography and Marine Research, Lagos	7	7	100
5	National Institute for Horticultural Research, Ibadan	7	7	100
6	Institute of Agricultural Research and Training, Ibadan	7	7	100
7	Nigerian Stored Products Research Institute, Ilorin	7	7	100
8	National Institute for Freshwater Fishery Research, New Bussa	7	7	100
9	National Animal Production Research Institute, Shika	7	6	85.7
10	National Veterinary Research Institute, Vom	7	7	100
11	Cocoa Research Institute of Nigeria, Ibadan	7	7	100
12	Rubber Research Institute, Benin City	7	4	57.1
Total		84	80	95.2

Field Survey, 2016

The total number of questionnaires administered to most of the institutes were completely filled and returned with the exception of NAPRI, Shika where one of the questionnaires could not be retrieved and Rubber Research Institute, Benin where only four were returned and found valid. The total number of questionnaire used for analyses were therefore 80 representing 95.2% response rate of the total administered questionnaires.

Research Question 1: Obstacles to Adequate Funding of Agricultural Research Institute Libraries in Nigeria

The opinion of the respondents on the obstacles to adequate funding of the libraries are presented in Table 7 which also shows the opinions of respondents to the listed obstacles to the adequate funding of the libraries in frequencies and percentages. Mean scores were computed for the respective items based on the five point scale with 3.0 for midpoint decision.

Obstacles to adequacy of funding the Institute libraries	Strongly Agreed		Agreed		Undecided		Disagreed		Strongly Disagreed		Mean
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
Misapplication of funds by the management is an obstacle to	9	11.3	16	20	11	13.8	26	32.5	18	22.5	2.7
Inadequate attention by the management to the issue of Nigerian	12	15	25	31.3	8	10	18	22.5	17	21.3	3
Lack of accountability and transparency by the librarians is an	4	5	12	15	9	11.3	31	38.8	24	30	2.3
Inadequate public-private partnership is an obstacle to adequate funding of	11	13.8	39	48.8	9	11.3	11	13.8	10	12.5	3.4
Appointment of non-librarians as board members is an obstacle to	12	15	13	16.3	19	23.8	20	25	16	20	2.8
Librarian is not among principal officers of institutes, is an obstacle to	9	11.3	12	15	11	13.8	25	31.3	23	28.8	2.5
Librarian is not proactive and or does not defend library developmental	6	7.5	14	17.5	10	12.5	30	37.5	20	25	2.5
Discrepancies and delay in the budget process is an obstacle to adequate	17	21.3	41	51.3	5	6.3	8	10	9	11.3	3.6
Lack of cordial relationship between librarians and the Executive Director is	9	11.3	10	12.5	7	8.8	30	37.5	24	30	2.4
Misappropriation of budgeted funds is an obstacle to	11	13.8	16	20	11	13.8	26	32.5	16	20	2.8
Is there separate budget for library from the institutional budget as an	3	3.8	19	23.8	21	26.3	19	23.8	18	22.5	2.6
Economic depression and inflation is an obstacle to	19	23.8	37	46.3	8	10	10	12.5	6	7.5	3.7
Devaluation of local currency is an obstacle to adequate funding of	16	20	25	31.3	12	15	17	21.3	10	12.5	3.3
Denial of the actual budget allocated by government to libraries by	18	22.5	21	26.3	6	7.5	18	22.5	17	21.3	3.1
Lack of monitoring and evaluation culture to support the libraries is an	11	13.8	31	38.8	9	11.3	20	25	9	11.3	3.2
Lack of qualified specialist on monitoring and evaluation team is	12	15	23	28.8	16	20	15	18.8	14	17.5	3.1
The result of No 16 results to the budget being less transparent than	5	6.3	26	32.5	19	23.8	17	21.3	13	16.3	2.9
Low allocation of funds by Federal Government to libraries is an obstacle	40	50	34	42.5	3	3.8	2	2.5	1	1.3	4.4

Research Question 1:

Table 7: Obstacles to Adequate Funding of the Agricultural Research Institute Libraries in Nigeria

Foremost in the obstacles to adequate funding of the libraries was the low allocation of funds by Federal Government to the agricultural research institute libraries. This was the unanimous factor of the inadequacy in the funding of the libraries and in Table 7 where the mean score is 4.4, which was the opinion of almost every respondent involved in the study. This is clearly shown in the graph and the high rate of agreement and percentage scores in the table. Next to this obstacle was the economic depression and inflation suffered in the country resulting in the devaluation of the Nigerian Naira, which made exchange rate and purchase of library materials very difficult to procure outside the country. In the table, the mean score for the item is 3.7. The finding is in agreement with the study of Uganneya (2012) that challenges in acquisition of library materials, qualified librarians, outdated tools for service delivery and poor infrastructural development led to a high level of scantiness over the years and subsequent lack of patronage by researchers (scientists) for whom retrieval of research information was required, to meet research institutes' mandates.

Other major obstacles included discrepancies and delay in the budget processes, inadequate public-private partnership, devaluation of local currency, lack of monitoring and evaluation culture to support the libraries, denial of the actual budget allocated by government to libraries by Executive Directors, lack of qualified specialists on monitoring and evaluation teams which are often reduced to mere field visits by such personnel and therefore made no meaning to the actual evaluation of the funding and finally, inadequate attention by the management to the issue of agriculture research institute libraries. These were scored in Table 7 at the midpoint of 3.0 and clearly indicated in Figure. 1 above. This finding agrees with the report

of Gbolagade and Aliyu (2011) who stressed that the habitual late completion of budget proposals between the National Assembly and Presidency caused both funding approvals and disbursements to be late and often led to conflict in the budget process.

Other obstacles like misappropriation of funds by the management, lack of accountability and transparency by the librarians, appointment of non-librarians as board members, non- inclusion of librarians among principal officers of institutes, the inability of Librarian to be proactive and defend library developmental proposals, lack of cordial relationship between librarians and the Executive Directors, misappropriation of budgeted funds and the inability to have a separate budget for the library along with non-transparency in budgeting were not considered as major obstacles to the sufficiency of funding the institute libraries.

The implication is that, the obstacle to adequate funding of agricultural research institute libraries in Nigeria had made planning difficult for the Libraries.

Services Provided with Received Funds by Agricultural Research Institute Libraries in Nigeria as a guide to Assessment of Funding

Among the services analyzed were abstracting and indexing, Internet services for users, photocopying services, literature search services, current awareness services and selective dissemination of information services. Also, the respondents' opinions on their agreement with the selected services are presented in Table 7 with graphical illustration of the percentage scores in Figure 1. The table shows the mean score for the respective items computed on a five point scale. Decision on items were based on the midpoint score of 3.0 mean score lower than 3.0 would therefore mean that the respondents disagreed with the notion expressed for the item.

Research Question 2:

Table 8: Services Provided with Received Funds by Agricultural Research Institute Libraries in Nigeria, as a guide to Assessment of Funding.

Services provided by the libraries to their users	Strongly Agreed		Agreed		Undecided		Disagreed		Strongly Disagreed		Mean
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
My library provides Internet services for its users 24 hours daily.	11	13.8	27	33.8	6	7.5	23	28.8	13	16.3	3.0
My library provides customer services to its clients.	26	32.5	45	56.3	6	7.5	1	1.3	2	2.5	4.2
My library provides photocopying services to its users.	22	27.5	38	47.5	4	5.0	12	15.0	4	5.0	3.8
My library assists users on literature search when they need it.	29	36.3	48	60	2	2.5	1	1.3			4.3
My library provides reference services to its users.	34	42.5	42	52.5	1	1.3	1	1.3	2	2.5	4.3
My library provides current awareness services to its users.	15	18.8	45	56.3	11	13.8	7	8.8	2	2.5	3.8
My library provides selective dissemination of information service to its users.	14	17.5	45	56.3	10	12.5	10	12.5	1	1.3	3.8
My library provides circulation services to its users.	19	23.8	37	46.3	17	21.3	5	6.3	2	2.5	3.8
My library provides extension and outreach services to its users.	11	13.8	34	42.5	16	20	13	16.3	6	7.5	3.4
My library provides media service to its users.	9	11.3	24	30	22	27.5	17	21.3	8	10	3.1
My library provides mobile library services to its users.	3	3.8	8	10	11	13.8	35	43.8	23	28.8	2.2
My library provides abstracting and indexing services to its users.	16	20	44	55	9	11.3	8	10	3	3.8	3.8

Key: Mean X= $\Sigma fx / \Sigma f$

X= Mean

Σ= Sum

f = Frequency (Number of Respondents)

x = Strongly Agreed (SA) =5, Agreed (A) = 4, Undecided (U) =3, Disagreed (D) =2, Strongly Disagreed (SD) =1

From the mean scores in Table 8 and the graphical illustration in Figure 2 above, the libraries provided to their users all the services listed on the table with the use of Mobile services being the only exception to what they offered. This fact was revealed by the frequencies and percentage of strongly agree, and the mean score of 2.2 on the table and the chart clearly supported this observation. It could therefore be said that the libraries provided Internet services, photocopying services, literature search, reference services, current awareness services, selective dissemination of information service, circulation services, extension and outreach services, media service and abstracting and indexing services to their users. This finding is consistent with the report of Udekwe (2017) who opined that agricultural research institute libraries in Nigeria provided the following services: Media Services, Extension and Outreach Services. The Australian Library Association (2016) also listed other services such as reference services, current awareness services, circulation services, selective dissemination of information services, Internet services, Inter-Library Loan services and photocopying services. Of the services provided by the agricultural research institutes' libraries with funds received, only mobile service was not provided in this study. The implication is that, this may only slightly affect service provision at the outstations of these institutes, as this mobile service is essential for extension workers in the institutes.

Test of Hypothesis

The hypothesis were aimed at determining differences in the obstacles of sufficient funding of the libraries as well as to establish relationship between funding obstacles and the investigated variables relating to the services delivery of the libraries. The data collected with respect to the hypothesis raised in the studies were analyzed and discussed. The hypothesis was tested as follows:

Hypothesis: There is no significant relationship between Obstacles to sufficient funding and services provided with received funds by agricultural research institute libraries in Nigeria as a guide for assessment of funding

This hypothesis was tested with the mean score on obstacles to sufficient fund allocated to the libraries in Table 7 and services provided with received funds by agricultural research institute libraries in Nigeria as a guide for assessment of funding in Table 9. The Pearson Product Moment Correlation (PPMC) procedure was adopted for the test because of the quantitative measurement of the variables involved and the result is summarized in Table 5.

Table 9: Correlation between Obstacles to sufficient Funding and Services Provided with Received Funds by Agricultural Research Institute Libraries in Nigeria as a guide for Assessment of Funding.

Variables	N	Mean	Std. Deviation	Std. Error	r-calc.	DF	P	Decision
Utilization	80	3.27	0.870	0.097	0.392	78	0.000	
Satisfactory Services	80	3.37	0.776	0.087				Rejected

(r-critical =0.217, P< 0.05

The result in Table 9 reveals that obstacles to sufficient funding allocated to the libraries was significantly correlated with services provided with received funds by agricultural research institute libraries in Nigeria as a guide for assessment of funding. The observed correlation coefficient (0.392) for the test was higher than the critical value of (0.217) at the 78 degrees of freedom. The observed P-value for the test was 0.000 compared with 0.05 fixed level of significance (P < 0.05). These observations provided enough ground for rejecting the null hypothesis. The null hypothesis that there is no

significant relationship between obstacles to sufficient funds and services provided with received funds by agricultural research institute libraries in Nigeria as a guide for assessment of funding is therefore rejected. The finding here agrees with Adeniyi (2017), who reported that the availability of relevant information materials, modern reference and documentation services and information and communication facilities could positively influence research and extension works of the institutes.

19.14 Findings, Conclusion and Recommendations

The Study provides a summary of major findings, conclusion and recommendations

Major Findings

The study revealed that:

i. The obstacles to adequate funding of agricultural research institute libraries in Nigeria, were low budgetary allocation; economic depression and inflation; discrepancies and delay in the budget process; inadequate public - private partnership; devaluation of local currency; lack of monitoring and evaluation culture to support the libraries; denial of actual budget allocated by government to libraries by Executive Directors; lack of qualified specialists on monitoring and evaluation team often reduced to mere field visits; inadequate attention by the management to issue of agricultural research institute libraries in Nigeria.

ii. Services provided by the agricultural research institute libraries in Nigeria with funds received were Internet, Photocopy, Literature search, Reference, Customer and Current Awareness services, Selective Dissemination of Information, Extension and outreach, Media, Abstracting and Indexing Services, except mobile services.

Conclusion

Low budgetary allocation by government constituted a major challenge to the funding of these libraries as high level of inconsistency in budgetary allocation militate against smooth planning and execution of objectives in the libraries, if the challenges of inadequate funding appropriate budgetary allocation and establishment of the right channel for fund allocation are adequately addressed, the service delivery of these libraries would probably improve beyond the level it is presently.

Recommendations

The following recommendations are hereby made based on the findings and conclusions reached in the study.

1. Allocation of 10% of total recurrent budgets of ARIs should be made available by the Federal Government for their libraries in order to improve services provision by agricultural research institute libraries in Nigeria, the librarian of each agricultural research institute libraries in Nigeria should be a Principal Officer of the respective institute to enable the librarian to have a meaningful understanding of funds allocations and there should be effective monitoring of funds to the libraries by the institutes and government teams.
2. Library staff should be trained and encouraged to discover more current services that are better for the users and beneficiaries (researchers or scientists and students) of agricultural research institute libraries in Nigeria.

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CHAPTER TWENTY

PRESERVATION AND RESTORATION METHOD OF LIBRARY AND INFORMATION RESOURCES IN MEDICAL LIBRARIES.

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PRESERVATION AND RESTORATION METHOD OF LIBRARY AND INFORMATION RESOURCES IN MEDICAL LIBRARIES.

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20.1 Introduction

Preservation is actions taken to retard or prevent deterioration or damages in natural properties by control of their environment and treatment of their structure in order to maintain them as nearly as possible in an unchanging state. Restoration on the other hand are actions taken to return a deteriorated or damaged artifacts as nearly as it is feasible to its original form, design, color, and functions with minimal further sacrifice of aesthetic and historic integrity. In library and information center, preservation and restoration of its resources is a programme which aims at providing a complete protection services beginning with systematic cleaning of the collection at a suitable intervals. The paper used at present in books and document are not generally intended for long storage. The aging and the mechanical ware of these books and document are very rapid due to length of storage time. The unfavorable condition and other factors contribute to detrioration. Furthermore, according to Cunha (2011) 'books, documents, newspaper and other media resources are fragile objects which by their very nature are easily damaged by careless or even routine handling" hence there is the need to preserve and restore the materials provided in the library. Vast qualities of deteriorated books and other information resources have accumulated in the teaching hospital library in this era of economic recession. In order to cope in solving the enormous and overgrowing deterioration of library materials. It is necessary to introduce preservation and restoration services into the teaching hospital medical library. The essence of preservation and restoration of various library and information resources is to provide suitable protection for each items added to the collection and to take various actions in preserving them for the use of future generation.

Preservation and restoration of medical library resources will develop the library and information resources which will serve as a stringboard for further development of students as it will basically support and enrich the formal curriculum of the school Fayose (2019). These program, which encompasses not only books and serial materials, but includes other information resources such as periodicals, photograph, maps, slides, computers, television, printer etc. In essence, the role of preservation and restoration programme enhance the protection of millions of publications, media resources and electronic gadget in the library.

20.2 Statement of Problem

Despites the importance of library and information center and the slim budget which it suffers often, it remains sad and disheartening to observe that the medical libraries are grossly deficient in facilities and poor in preservation and restoration processes, in which not enough attention has been paid to the care of various collection. These leads to great problem and setback in the development of the libraries which hinders it effective service to student, staff and other information seekers. Thus, affects the learning of medical practice in most African counties especially Nigeria.

20.3 Objective of the Study

To examine the various types of information resources stored in the teaching hospital libraries the following objectives were formulated to guide the survey:

1. To identify possible means of preserving the various library collection.
2. To examine the method used in restoring existing damaged resources.
3. To examine the necessities of preservation and restoration of the libraries collections.

4. To determine the various enemies of these libraries and information resources.

20.4 Review of Related Literature

The problem of books deterioration and damages of media resources such as computer, scanner, photocopier, television etc. are issues that must be reckoned with. The deterioration/damages of library materials forms the basic problem of the center and gives rise to the need of preservation and restoration. Many collections both print and non-print of important information in our teaching hospital have been damaged and put out of use by agent of deterioration (man and other factors inclusive). Many writers have one thing or the other to say about issues of preservation and restoration of library and information center collection.

20.5 Book and its Nature

Written information which serves as the bases of all the library and information collections are inscribed or written on "paper" i.e. print materials. Hence it is of absolute importance to trace the history of paper. The history of paper could be traced to several thousands of years B.C. in Egypt when the act of writing (hieroglyphic) was discovered by Egyptian philosophers. Information was inscribed on walls, stone, wood and animal skin to relay messages to information seekers. In the cause of these, "Papyrus" which are weeds that grows naturally by the bank of river Nile was discovered by natural cause. This weed (Papyrus) was sliced (opened), spread in the sum and allowed to dry. The slice, which is plane with smooth surface is some inches wide in diameter. These sheets are glued together to form plane sheet for writing on. The written information are preserved in a cool dry place to prevent destruction by insects, notes and other agents of destruction Clement (2011) 'preservation policy'. The materials for writing proceeds until when the Chinese scholars discovered 'paper'. Paper was made of grinded particles from pulp wood in addition to chemical combination which in turn form a wide plane sheet, smooth surface and suitable for written on. Paper remained the material for storing information in print till date, though science and technology has improved paper production both in texture, quality, colour and durability. The non-print materials came up since 19th century to argument the print materials in information collection, processing, storage, retrieval and dissemination to information seekers. Therefore, based on the analysis, paper is made up of organic materials (pulpwood) and other material which are subject to deterioration by agent of destruction both naturally and artificially. Adequate care must be taken to preserve this very important material that embraced information. In addition, deteriorated ones which can still be mended should quickly be done to bring them back to use.

20.6 The agent of deterioration includes the following

(i) Insect (ii) Cockroach (iii) Mold (iv) Temperature (v) Rats (vi) Fire (vii) Water (viii) Man (x) Age.
The combination of paper with written information, which is "a non-periodical printed publication of at least 49 pages excluding the cover page, forms a book" UNESCO (1964) which library and information centre houses several of them (printed materials). Paper deterioration became serious since 1774 when Karl Williams Shuler, a Swedish apothecary isolated chlorine which within a short time was used for bleaching paper, and this reduces the lifespan of the paper. Moreso, an atmosphere polluted with sulphur dioxide or nitrogen dioxide increased the acidity of paper irrespective of its original alkalinity and consequently, can contribute to paper deterioration. Roger (2011).

20.7 Media Resources and Their Make Up

Media resources are electrical/electronic machine/device which are designed to aid the collection, processing, storage, retrieval and dissemination of information of few and large audience (information seekers) in both near and remote location across the globe. These resources are also referred to "information and communication technology" (ICT) facilities. They are used at home and all aspect of business and education because of their comfortability, easy usage, storage capacity, and dissemination outreaches. These devices/facilities are handled by trained personnel and experts for effectiveness and safety. Media resources/ICT facilities includes the following: Computer: Computer is a wonderful machine/device invented by man. It is a multipurpose machine which can be used for writing text (MS Words), processing (PowerPoint), storing information (ROM, RAM) and other external storage facilities such as digital versital, digital DVD-Read only memory, flash drives, CD-ROM etc. dissemination of information via the computer screen to the user and to information seekers in near and remote location with the aid of modulator. Demodulator (MODEM) and satellite facilities information are also retrieved with the use of the above listed devices. Computer can also be used for audio visual i.e. watching recorded information in text, motion picture (film) and listening to audio messages, receiving text, graphics, motion picture, from other computer in a computer network and satellite communication.

The above stated function of computer makes it a very important facility in the daily and effective operation of any library and information center. Scanner or Scanning machine: This is a very important device/machine which is used to transfer (scan) a printed information on paper (hard copies) into a computer system (software). The information (software) can be edited, processed, retrieved and disseminated to other users in another location on the network.

1. **Printer:** Is used for printing out soft copies of the stored information on a paper (hard copy). Printer can print in color or black and white depending on demand.
2. **Photocopier/photocopy machine:** Used in duplicating a printed material into the same format. Some has the ability to duplicate as many copies as possible within a stipulated time.
3. **Radio:** It is an electronic device which is used to receive audio message through radio wave depending on location. It is commonly used among information seekers to listen to news and important information both in near and remote villages where radio wave encompasses.
4. **Television:** An electronic that is designed to relay both graphic, text and audio messages via the screen which are of different sizes.
5. **Telephone:** (both landline and GSM used to make and receive calls to and from different location on the globe. It is also used to send and receive text messages.
6. **Projector:** used to address large audience via motion picture with audio and text messages displayed on special screen.
7. **External storage facilities:** These includes flash drives, hard disc, DVD ROM, Floppy disc, slides etc.
8. **Satellite/Modem:** Used for network connection and transfer of information i.e. telecommunication.

Media resources/ICT facilities as listed above are made up of sensitive electrical materials which are very fragile. These materials includes integrated circuit (IC), Diode, Cartode ray tube, fuses, screen, coaxial cables, paired wire, optic fibers etc. These materials and more are technologically combined to serve the function which they are made for, hence the frequently and need careful handling as follows:

1. They must be kept in a cool dry place preferably in air conditioned facilities.
2. Not arranged together or placed on each other like printed materials.
3. Moving them from one location to the other must be done by care and professionally too.
4. Since most of these materials are electrically driven, they must be connected to a stabilizer to prevent damages by high voltage or electric current fluctuation.

5. The materials must be operated by a trained personnel or expert for better performance. Ellismount (2017).

20.8 Preservation and Restoration of Library Materials

Preservation and Restoration of Library and information materials are topics which have become increasingly important in the last three decades for various reasons. Beatrice Kovac (2017) itemized the reasons to include:

1. During the sixties, library and information collections were increased substantially.
2. Traditional collection comprises of books and periodicals were augmented by other type of materials such as media software and equipment.
3. The seventies period were of fiscal restraint, budget were not increased, coupled with the rate of library collection declined.

There is no doubt that heavier use of book and media resources by students/staff and the increasing air pollution couple with deteriorating quality of paper and damages of media resources affect the medical library collection today. If the teaching hospital are to have materials essentially, next century scholar, librarian will need to appoint conservationist who will be expert in preservation. Roger (2011). Reported that the "Recent research shows that it is possible to increase the lifespan of paper from two hundred to five hundred years by reducing temperature from 77^0C to 68^0C. It can be noticed that deterioration of the medical library materials occurs slowly. But in the medical libraries teaching hospital, book cannot be circulated to readers at a time because many of such books are physically scarce and may have already suffered loss of text due to heavier use by readers. Roger et al (2011) declared that "in order to preserve the collection of our libraries for future generation, reasonable care must be taken in handling book, in cleaning them, in putting which need rebinding in a special collection department" Roger is of the opinion that most books published since the last quarter of the 19th century carry with them the seed of their own destruction. Eboka (2014) interprets preservation to conservation of library materials "He sees librarian not only as book-keepers but also carrying out greater activities such as acquiring, stamping, accessioning, labeling, cataloguing, classifying, pasting, book pocket and so on. Preservation as 'prevention of environmental damages to stock which involves shelving, handling and dusting of library resources. Moreso, preservation is an action taken to prevent or stop the deterioration of library resources, while restoration concerns all that is done to the library stock in order reasonable time.

Collection analysis project (the CAP), felt that preservation is an integral part of collection process from the moment decision were made to purchase material through collection, evaluation and review. It can be recognized that, medical libraries should no longer continue acquiring and storing collection without considering the problems of preserving them. Though, the concern to preserve library material is not now, yet little effort have been made by librarian and library management to utilize the various finding which were made available. Protection of library material from theft, physical deterioration, fire and other disaster continue to be a growing concern of librarians. One single solution for the loss of library resources, is the medical library's conservation and preservation programme.

Preservation and conservation have erroneously been used interchangeable in the literature. Whereas to preserve and to conserve may literally be seen as synonymous in meaning, the librarianship practice a slight distinction use of words. A material may be preserved in its original form, while it could be conserved in some other form than the original. That is, conversion into non-print. Information preservation is a large-scale operation concerned with effective management of the library's stock, or the information resources to which it has both local and distant access. It is a form now used for collection management responsibilities intended to preserve print and non-print material, for future generations. The activity is considered from the point of accession (i.e. when the length of time of a material usefulness in the collection is determined) to recession (i.e. when the material either becomes obsolete or too fragile or should be discarded). Fragile

books and manuscript are usually replaced until surrogate copies, reprint, microform or facsimile. At a higher level, preservation connotes for more than keeping a material in its original form or being familiar with all reformation technologies available. It also means accessibility. When a user needs it, he get it. Hence, the whole process of security, shelving, shelf-reading, and correlation are actually preservation techniques, preservation implies the state of being or remaining in a stated condition after a long time, while conservation refers to the controlled use of a limited supply of materials to prevent waste or loss so as to facilitate its use in future. Preservation as the "maintenance of collection and individual object as close as possible to the original condition through appropriate housing, handling, repair and conservation treatment". The decision to repair a particular item or to intervene in the deterioration of a material is essentially managerial or professional.

20.9 Preservation and Restoration Policy's

In order to enhance preservation and restoration activities in medical libraries, the need to outline guidelines and principles must be the very step. Deterioration occurs systematically on a large scale, the only way to ensure existing lifespan of material panels is to preserve them and restore the damaged ones. Users have a verifying needs, although librarians are trained but there is limit to the existence to which their anticipation can go while the present clients are being served, future client must be considered as well. Decision on preservation and restoration are most effective measure libraries can take to show the deterioration process. To prolong the useful life of their collection, smaller libraries especially medical libraries with limited funds and few staff should identify brittle books, serial materials and high quality media resources which can stand the test of time with available spare part for repairs in case of damages or malfunctioning. The key element is to undertake administrative planning before embarking on a course of action policy steps should include inspecting the storage facilities, conduct survey to determine the extent of deterioration among the various format of materials in the collection, training a realistic plan of action tailored to the budgetary and stating realities of the library and planning a disaster preparedness and recovering programs.

It could be note that present-day collection are composed largely of books printed on instable paper and low quality media resources and libraries will continue to acquire significant work printed on poor paper. Library and information center preservation may be characterized as follows:

1. It is highly technical and is concerned with such complicated topic as the chemistry of materials, the monitoring of environmental control system and thus design of both media resource structure.
2. The ethical and philosophical framework within which preservation decision must be well developed.
3. The need for preservation of library/media materials is both massive and urgent.
4. Preservation is expensive-given the quality of materials that is, deteriorating.
5. The problem of medical library preservation are highly diverse as a result of wide range of physical format found in library and information collection and the difficulty distinguishing materials of an artificial nature from those of value solely for their intellectual content.
6. Some material have anti-factual values and would never be adequately replaced by any copy whatsoever no matter how diligently done.

Before drawing up a policy, it is necessary to survey the collection so as to formulate policies on factual information because library materials are in wide variety of distinguish shapes and fervent which often prevent problems in relation to library storage and access procedures. Some of the materials like textbooks, newspaper and literature (novels) etc. can prove very difficult to organize, shelve and control. The three main factors that are important in the process of taking decision regarding preservation and restoration includes:

1. The building: to identify potential arising from security, fire, flood and other natural disasters.

2. The interior buildings: Including reading and storage areas to access the environmental condition, the physical level, the temperature, humidity, accessing level of dust and atmospheric condition.
3. The collection: to identify the scale of damages due to paper and media resources including assessment of paper embitterment, damages due to mould or insect could damage the building etc. note those policies can only be meaningful when fully implemented.

20.10 Causes of Paper Deterioration

Deterioration according to the scientists is defined as the process of transition from higher to a lower energy level. The enemies of books/paper are many. To read through a catalogue of their ravages whether wild or serious is a man himself. The library association (2012). There are three main ways in which you can prejudice the future of his/her valuable book while other enemies of paper are as follows:

1. Man as manufacturer: Library materials may already be seriously contaminated by harmful acid (causing brittleness in paper and pondering in leather) this render the materials inferior even before coming into the librarian care. The interior material, lack of proper binding, book back and cover and packaging by the manufacturers inclusive.
2. Library users: The patrons, clientele or users of the library material can also cause great damages and deterioration to library materials by their unnecessary use/over usage and manhandling of such materials. Library association (2012) states that “man as user causes a great deal of damages and deterioration of library material”.
3. Amateur librarian: library association (2012) stated that “librarian have been the cause of much well-intentioned damages to book in their custody in addition to the use of poor quality and high acid level storage and strapping material. The librarian uses salt-adhesive tape which usually stains paper after a short while.
4. The atmosphere as human being requires grantable atmosphere for living, so also library materials requires favorable atmosphere. According to Roger (2011) “that atmosphere polluted with sulphur-dioxide or nitrogen increased the acidity of paper irrespective of its original alkalinity and can consequently contribute systematically to deterioration”. Library association 1972 also recognizes that “even comparatively clean air can, in the fullness of time, be harmful to library material since its oxygen can cause oxidation of some material. Carbon and other aerosol deposit carries other impurities with them and setting on books, enable sulphur dioxide to start it works quickly.
5. Light: Ultra-light of sunlight or at unfiltered fluorescent lamp causes damages to paper and textiles. It heat factor can create more damaging to book and its covers.
6. Darkness; Darkness in the library encourages the presence of insects, rodents and growths of fungi which can stain paper, obliterate ink, rot leather, wood run, cloth cover and cookie buildings.
7. Excessive dryness can also desiccate leather paper and parchment.
8. Temperature: Roger (2001) “indicates that with recent research, it is possible to increase the lifespan of paper from two hundred to five hundred years by increasing temperature from 27^0 to 68^0C Fahrenheit.

This shows that a high-temperature of about 77 Fahrenheit well lead to excessive heat to excessive heat which will also encourage the growth of moulds, the presence of verium and accelerate chemical processes of deterioration. Fire even when books themselves are relatively undamaged may cause the paper to lose its told strength.

20.11 Causes of Media Resources Damage

Media resources/ICT facilities are made-up of sensitive electrical/electronic materials that are so fragile hence, they require careful handling, storage and adequate protection.

1. Man as manufacturer: since the materials which these resources are made up of are designed by man, there are tendencies that unavoidable mistakes can occur in the process of coupling, fitting, packaging, transporting and installing. Other manufacturer can make use of absolute or low quality material in their design before supplying the librarian.
2. Library user: Users, clientele who are not trained to handle any of the media resources hence such users must not be allowed to operate on their own except with the assistance of a trained personnel. Everest (2012).
3. Amateur librarian: Librarian who is not experienced or trained to handle media resources ends up causing damages to them as a result of operation, connecting to circuit and malhandling. Koracs (2018) “Atmosphere polluted with sulphur dioxide or nitrogen increases the acidity that deteriorates paper and damages to media resources harmful to library materials.
4. Light – ultra violet ray/light of sunlight or unaltered fluorescent light can cause damages to media resources integrated circuit, picture screen and other sensitive material which they are made up of.
5. Darkness: This encourages the presence of rodent such as rats, wall gecho, insects, cockroaches which causes harmful damages to these resources.
6. Humidity: Excess humidity causes water which allows the growth of fungi, and rust to these resources which already has been instructed that it must be ‘stored in cool, dry place.
7. Excessive dryness: Also causes cracks/brakes to the covers of these resources which is mainly made of plastic cover.
8. Temperature: High temperature also causes damages to these resources. High temperature encourages the growth of moulds, presence of variums which accelerate chemical processes which causes damages to the resources Everest (2012).

20.12 Methods of Preserving Library and Information Resources

Books which constitute most of the print material has traditional mode and methods of preserving them from deteriorating. This involves to firstly treat the book with cedar oil, after which the books will be rolled and placed in earth jars. The modern and more effective protectors of books, shelves include the following:

1. A good environment and regular dusting and cleaning of both print and non-print materials.
2. Brush the books and clean the media resources if necessary, in the open air at regular interval of time.
3. Place the books opened for use in a container which is placed a dish of crystals and paradichiorobenezene (½ OZ per cubic foot of air space) then seal the container, leave for at least a fortnight and open it out of doors. Media resources are returned to their various location after routine services by experts makers or manufacturer.
4. Thoroughly clean the book shelves, drawers, cupboards, treat them with a 0.5% solution of DDT in white spirit or a recommended proprietary fluids, paying particular attention to cracks and crevices. Adequate care must be taken to avoid using highly inflammable solution and avoid spillage of solution onto shelves and desks. Allow the cleaned surface to dry very well before replacing the books and other materials.

Plumber (2014) sees that “many countries needs book pathology centers to guide reputable publishers to issue books that will be immune to insect and fungi attack. He was of the view that the best protection for any collection of material (print/non-print) is a concrete building with preferable air condition. He suggested some methods which include to destroy insect already present and to:

i. Fumigate the entire building with hydrogen cyanide
ii. Vacuum fumigation in a vacuum chamber with ethylene oxide and carbon dioxide.

To prevent insects attack

i. Keep all insect out of the building as far as possible by rendering the building termite proof.
ii. Lacquer windowsill, window frames and the rear slide and fore edges of book shelves with insects' lac.
iii. Brush book shelves with two thick layer of xylar monbro-clear which is odour free.

Langwell (2017) in his book "The conservation of books and documents" said "the objectives of the work is to suggest means for reaching a compromise between the medieval practices of almost all book and records as indispensable as possible and the modern practices of making almost all books and records as cheap as possible to the extent of disregarding almost completely the requirement of performance. Book are regarded as children needs care and attention at early life. He is of the opinion that all the various activities done on book like the opening of the book, collating, recording, accessioning, cataloguing, stamping and exhibition offer some destruction of library materials. According to him, repair and mending of books, pamphlets, all publication can be done through covering with silk or tissue paper, gluing and making paste for loose and torn pages and also filling holes in a torn page. Repackaging, restoration of book cloth, ink removal and inter cleaning are the various ways to repair and restore library material. Insecticide, liquid or powder can be used for the control of destructive agent like insects, and try bulb thermometer may be used to maintain average temperature of humidity for library materials.. Library association (1972) further disclose that, it is desirable for the most valuable material to be stored in strong room. Close attention should be paid to the requirement specified in the standard. They suggested other method of preservation and restoration of library and information of library material to include:

1. Circulation of air: In general, the possible circulation of clean air compatible with other security measure should be encourage since it will inhibit the formation infestation by insects or moulds. For this reason, grilled cupboard are to be preferred locally enclosed ones.
2. Theft and wanton damages: Ravities should be hanged in rooms which are normally accessible to the general public of the library.
3. Fire: Fire alarm system and extinguisher should be installed to prevent more damages to books. Carbon dioxide extinguisher are the most suitable for small fire, however in larger outbreaks, the risk of water, damages has to be accepted and gas-pressurized water extinguisher are often suitable.
4. Temperature, and relative humidity: There are to be constant temperature within the range of 55^0-65^0 Fahrenheit and a constant relative humidity of between the ranges of 55% - 65%.
5. Packaging: Packaging must be carefully done and professionally too to library and information material in the library to ensure preservation.
6. Constant cleaning of library building i.e. cobweb or spider webs must be cleared off from time to time, book shelves, cupboard, drawer and all the print and non-print must thoroughly be cleaned at interval since dust and dirt harbor encourages moulds, acids, insects and other enemies of book. Use gentle vacuum cleaning, very soft brushes for removing surface dirt from the collections while powdered art gum or soft eraser may be used to remove dirt which has worked into the material.

In some recent studies. The problem of libraries in the area of acquisition, preservation and restoration of library and information materials could be made possible base on the below suggestion which includes:

1. Library and information material should be ordered from regular authorized dealers instead of overseas.

2. Solution policy should guide the authority connected with buying of library material.
3. Simple equipment for the repair of book should be provided
4. Users should be taught on how to handle information materials.

Some author are of the opinion that there is need for librarians to be conscious of the caring and restoring of damaged material in ether to preserve, intellectual heritage of the past to remain continuously available for both present and future generation. He classified agents of destruction of library and information as (i) biological (ii) Physical (iii) Chemical deterioration, lack of funds, facilities and lack of trained personnel. In conclusion, he gave suggestion to the publishers that they should make use of paper, binding cloth and boards to which an insecticides and fungicides have been added during the process of manufacture. Instructions were also given to users which includes providing rules and regulation against dirty hands while eating. Some methods for preserving library materials include:

1. Create a staff appointment for a preservation librarian or (a) hire a part-time preservation librarian. (b) Combine the responsibilities of conservation librarian with half-time position in the library.
2. Appoint a standing committee on preservation.
3. Centralize all repair work on paper and cloth material in binding section.
4. Undertake a programme to provide satisfactory environmental condition in the libraries.
5. Establish safe repair procedure and acquisition guideline for non-print and microfilms.

20.13 Methods of Restoring Media Resources

Media resources as earlier explained are made up of sensitive integrated circuits fuses and other sensitive electric/electronic materials which require adequate care and professionalism to handle and operate. The mode and method of preserving media resources is almost the same with that of print materials except that non-print (media resources) must be:

1. Stored in cool dry place preferable in an air condition facility e.g. computer, projector etc. since they are electrically driven hereby cooling down the system.
2. They are not to be placed on each other and enough space must be given to ensure circulation of air.
3. Ensure that all appliances be connected to a stabilizer while in use to avoid damages by high voltage and fluctuation of electric current.
4. Materials must be cleaned or dusted with clean piece of cloth before and after use.
5. All appliances must be stored or kept at a standby position and not otherwise.

Restoration

Any of the media resources e.g. computer that is damaged or stops functioning must be repaired or restored by a trained personnel that specializes on the repair of such. Or contact the supplier or manufacturer for after sale services. Patrova (2013) ‘Restoration and Preservation of Library resources”.

Summary

Books (text) formed the largest stock of the library resources. Media resources followed closely because of the importance, especially, in this “Information age”. Serials, encyclopedia on medicals and health related information resources are among the stock. There are maps and teaching aids to enhance teaching and learning among the lecturers and student of the school. These resources were acquired mainly through direct purchase, few through gift and donations, from philanthropist and publishers. The serials in the various libraries are arranged on shelves especially, the medical journals, but the newspapers are all binded hence, arranged loosely on the cupboard.

The purpose of preservation is to protect the existing materials from damages and to create resistance on paper against fungi, insect, and other agent of deterioration. In order to make it available to users in its original form. Open shelves is widely in use in the libraries thereby allowing the library staff to inspect, retrieve and re-shelve material easily. Cupboard and other cabinets are common to preserve materials especially from stealing and mutilation. Spraying of the material (libraries) is mostly adopted to prevent damaged caused by insects. Rats, cockroaches etc. The purpose of restoration is for the treatment of deteriorated and damaged materials in order to bring it back to use, hence, re-binding, photocopying, gluing of tored books offered books leaves and restoration chemical the major procedures of restoring damaged materials, while repairs are done to media resources to bring them back to use.

Conclusion

It is observed that these libraries are former office blocks that were converted to a library house, they have very small space for staff and clientele, serials such as newspapers and journals are piled up without proper arrangement. The sitting arrangement for users are checked up. This condition discourages many library users and staff as well. The computer room hardly contain six computer set with limited space for users. The absence of bindery unit and lack of restoration effort by the existing staff can result to loss of information resources. Finally, lack of further training in librarianship and attendance of seminars by the libraries staff contributes immensely to the setback in the libraries and poses a lot of danger to the existing library and information resources.

Recommendations

For effective protection of medical library resources in the teaching hospital, this study gives the following recommendation.

1. The teaching hospital should build a standard library in the hospital environment with state of the arts of modern library collection and standard sitting arrangement for users and staff.
2. The existing library staff must be motivated to further their studies in librarianship, attend seminars and lectures.
3. The libraries services and operation need be automated in this era of information and communication technology ICT.
4. More computers and other ICT infrastructure need be added to the libraries collections for staff and customers use.
5. The libraries personnel needs to be computer literate hence, they should attend organize lectures and training on computer and other ICT infrastructure.

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CHAPTER TWENTY ONE

Redefining Public Libraries in an Era of Emerging Technologies for Effective Service Delivery

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Abstract
In the rapidly evolving landscape of the digital age, public libraries are at a pivotal crossroads, where traditional roles and services must adapt to meet the needs of contemporary society. This paper explores how emerging technologies such as artificial intelligence, virtual reality, and digital platforms can be

integrated into library services to enhance accessibility, engagement, and community relevance. By examining current literature and case studies, we identify key strategies for redefining library services that not only preserve their foundational missions but also empower them to become dynamic hubs of learning and innovation. Ultimately, this paper argues for a transformative approach that embraces technology while fostering community connection, inclusivity, and lifelong learning.

21.1 Introduction

Public libraries have experienced significant technological change in the past decades, and the pace of change continues to increase due to emerging technologies in rendering library services in the public library. These changes have had considerable impact on the services that public libraries offer and the way that they offer them. According to Shynee (2023) the concept of public libraries have transcended their traditional brick-and-mortar boundaries, as we embrace the emerging technologies, all kinds of libraries, especially public libraries are undergoing a remarkable transformation. Public libraries are no longer just repositories of books and information, public libraries are evolving into dynamic, tech-infused hubs that cater to the diverse needs of modern society.

Public libraries have long served as bastions of knowledge, community engagement, and cultural preservation. However, the advent of emerging technologies has created both challenges and opportunities for these institutions. As society increasingly relies on digital resources for information, communication, and education, libraries must adapt to remain relevant and effective in service delivery. This paper aims to explore the intersection of public libraries and technology, examining how libraries can leverage these advancements to enhance their services, engage diverse populations, and foster a culture of innovation.

We will analyze the current landscape of public library services, considering the impacts of digital transformation and shifting community needs. By reimagining their roles in the face of emerging technologies, libraries can not only survive but thrive as essential components of their communities.

IFLA/UNESCO Public Library Guidelines (2001) described public library as an organization established, supported and funded by communities either through local, regional or national government or through some other forms of community organizations. According to Osuigwe & Unagha (2018), public library is set up to achieve the objective of informing and educating communities with universal access to information as a right and not a privilege. Aiyebelehin & Egharevba (2019) opined that public library as a unique form of library provides access to knowledge, information and works of the imagination through a range of resources and services and is usually available to all members of the community regardless of race, nationality, age, gender, religion, language, disability, economic and employment status and educational attainment. Okwu & Opurum (2021) stated that one cannot strike down the fact that public libraries provide opportunities that encourage and support teaching and learning activities which in turn promote education in the society.

Public libraries play essential and fundamental roles in the complete development of the society. Public library is therefore an organization set up with public funds to provide members of its community with free and open access to knowledge and information, especially in developing countries like Nigeria. They serve as conduits of timely information, equipping people with lifelong learning and literacy skills such that they are empowered to positively shape the future of their societies,
Functions of the Public Library

The public library unlike other types of libraries is not restricted in whatever way, Abdulsalami, Idada & Egharevba (2020) stated that the functions of public libraries include educating members of the community it serve, promote and preserve the culture of the community, provide important data to government and people of the community it serves and also serves as relaxation and recreational centre to the community it serves. Public libraries are key public institutions that have a vital role to play in development at every level of the society.

The philosophy, orientation and nature of public libraries are routed in the responsibility of disseminating diverse and current information services to the members of its community and also play the fundamental roles in providing members of its community with free access to knowledge, especially in developing countries around the world.

The importance of effective public libraries service delivery cannot be overemphasized if the public libraries must achieve the objectives of being set up to meet the information needs of members of its communities within the shortest possible time. Madu, Onyenekwe & Azubogu (2018) clearly stated that effective service delivery by public libraries are important to the communities they serve because they owe the communities the social and educational responsibility of giving the dwellers access to information in all format, both online and physical. Therefore, it takes the establishment of public libraries to give the people access to the desired and deserved information and knowledge that is needed to pursue and direct developmental activities in the community, notwithstanding the challenging factors. Library services in communities must therefore be given top priority in achieving the goals and objectives of the national policy on education in the society. Egharevba & Obaseki (2022) posited that public libraries play fundamental roles in providing members of its community with free and open access to knowledge, especially in developing countries like Nigeria where public libraries serve as conduits of timely information, equipping people with lifelong learning and literacy skills such that they are empowered to positively shape the future of their societies. Abdulsalami, Idada & Egharevba (2020) further emphasized that these services as rendered by the public libraries are now being carried out using emerging technologies to effectively and efficiently render the services

21.2 Statement of the Problems

Public libraries face several challenges in adapting to an era characterized by rapid technological advancement. These challenges include:

1. **Resource Limitations**: Many public libraries operate with limited budgets, making it difficult to acquire and implement new technologies. This financial strain can hinder the ability to provide updated services and resources.
2. **Digital Divide**: As technology becomes increasingly integral to library services, disparities in access to digital resources can exacerbate inequalities. Underprivileged communities may lack the necessary tools and internet access to benefit fully from library offerings.
3. **Changing User Expectations**: Today's patrons expect seamless, technology-driven experiences similar to those provided by commercial entities. Libraries must adapt to these expectations while remaining committed to their core mission of access and equity.
4. **Staff Training and Development**: As new technologies emerge, library staff often require ongoing training to effectively assist patrons and leverage these tools. A lack of professional development opportunities can limit the potential of library services.
5. **Community Engagement**: Libraries must rethink their roles to remain relevant in their communities. Without innovative engagement strategies, libraries risk becoming outdated and losing their status as vital community hubs.

21.3 Objectives

The primary objectives of this paper are to:

1. **Identify Key Technologies**: Examine the emerging technologies most relevant to public libraries and their potential to enhance services.
2. **Assess Community Needs**: Evaluate the evolving needs and expectations of library patrons in a digital age to inform service redesign.
3. **Propose Strategies for Integration**: Develop actionable strategies for integrating technology into library services while maintaining a focus on inclusivity and community engagement.

4. **Explore Staff Development Needs**: Identify training and professional development opportunities necessary for library staff to effectively navigate and implement new technologies.
5. **Foster Collaboration**: Encourage partnerships between libraries, tech companies, and educational institutions to create innovative programs and services that benefit the community.

21.4 Literature Review

The literature on public libraries and technology reveals a spectrum of responses to the digital transformation. Scholars and practitioners alike have discussed various aspects of this evolution:

1. **Technology Integration in Libraries**: Many studies highlight the increasing integration of technology into library services. For instance, McClure and Lankes (2018) emphasize the importance of digital literacy programs in equipping patrons with the skills necessary to navigate a technology-driven world. This integration not only enhances traditional services but also promotes lifelong learning.
2. **Community Engagement and Inclusivity**: Research by Pagowsky and McElroy (2016) explores how libraries can use technology to reach underserved populations. They argue that digital tools can facilitate access to information and resources, thereby fostering inclusivity. Programs such as mobile apps, online catalogs, and virtual workshops have emerged as vital means of engagement.
3. **Redefining Library Roles**: As noted by Tenopir et al. (2017), libraries are shifting from being mere repositories of information to becoming active participants in knowledge creation and community building. This shift necessitates a redefinition of library roles, with an emphasis on collaboration, innovation, and adaptability.
4. **Case Studies of Innovative Libraries**: Several case studies showcase libraries that have successfully embraced technology. For example, the Chicago Public Library's Maker Lab provides access to 3D printing and other technologies, fostering creativity and hands-on learning. Similarly, the San Francisco Public Library's virtual reality programs have transformed how users interact with information.
5. **Challenges and Barriers**: Despite the potential benefits, the literature also addresses challenges such as budget constraints, staff training, and the digital divide. As highlighted by Smith (2020), addressing these barriers is crucial for the successful integration of technology in libraries.

Existing literature provides a robust framework for understanding the role of emerging technologies in public libraries. By building on these insights, this paper will propose actionable strategies for libraries to redefine their services and enhance their impact in the community.

Assessing community needs is essential for public libraries to effectively adapt their services and leverage emerging technologies. This process involves understanding the demographics, interests, and challenges faced by community members. Below is a framework that discusses methods for assessing community needs, supported by relevant citations.

21.5 Assessing Community Needs in Public Libraries

1. **Community Surveys**
    - Surveys can be an effective tool for gathering direct feedback from patrons about their needs, preferences, and perceptions of library services. According to Sturges and Condit (2016), well-structured surveys can capture valuable data that informs library programming and resource allocation.
    - Example: The Public Library Association (PLA) has developed templates for community needs assessments that libraries can customize to their local contexts (Public Library Association, 2021).

2. **Focus Groups**
    - Conducting focus groups allows libraries to engage in deeper conversations with diverse segments of the community. As noted by Pritchard and Hughes (2019), these discussions can uncover nuanced insights into community expectations and barriers to access.
    - Example: A library in New York City successfully used focus groups to understand the needs of immigrant communities, leading to targeted programming and services (Miller, 2018).
3. **Community Demographics Analysis**
    - Analyzing demographic data helps libraries understand the composition of their service areas, including age, ethnicity, income levels, and education. This information is crucial for tailoring services to meet the specific needs of different population groups (Harris & Smith, 2020).
    - Example: The American Library Association (ALA) provides resources for libraries to access demographic data, which can inform strategic planning and service design (ALA, 2022).
4. **Usage Statistics and Analytics**
    - Libraries can analyze circulation statistics, program attendance, and digital resource usage to identify trends and areas for improvement. According to McClure and Joseph (2017), data-driven decision-making allows libraries to respond proactively to changing community needs.
    - Example: The San Francisco Public Library implemented a data analytics program that revealed shifts in patron interests, prompting the introduction of new digital resources and workshops (San Francisco Public Library, 2020).
5. **Collaboration with Community Organizations**
    - Partnering with local organizations and stakeholders can provide libraries with insights into community challenges and needs. Engaging with schools, social service agencies, and local businesses can foster collaborative approaches to service delivery (Bennett, 2019).
    - Example: A library in Seattle partnered with local nonprofits to better understand the needs of homeless patrons, leading to the development of targeted services and support programs (Johnson, 2021).
6. **Feedback Mechanisms**
    - Establishing continuous feedback mechanisms, such as suggestion boxes or online comment forms, allows patrons to voice their needs and suggestions on an ongoing basis. As noted by Elliott and Trivette (2018), this can create a culture of responsiveness and inclusivity.
    - Example: The Chicago Public Library uses an online platform to solicit feedback on programs and services, which has resulted in more responsive programming (Chicago Public Library, 2022).

Assessing community needs is a dynamic and ongoing process that requires libraries to engage actively with their patrons and analyze relevant data. By employing a combination of surveys, focus groups, demographic analysis, and collaboration with community organizations, libraries can effectively identify and respond to the needs of their communities. This proactive approach not only enhances library services but also fosters a stronger connection between libraries and the communities they serve.

21.6 Strategies for Integrating Emerging Technologies in Public Libraries

1. **Develop a Technology Integration Plan**
    - Libraries should create a comprehensive plan that outlines how technology will be integrated into existing services. This plan should include goals, resource allocation, and timelines. According to DeVoe (2018), a strategic approach ensures that technology aligns with the library's mission and community needs.
    - Example: The Denver Public Library developed a technology integration plan that emphasizes community engagement and resource accessibility (Denver Public Library, 2021).

2. **Enhance Digital Literacy Training**
    - Offering workshops and training programs focused on digital literacy can empower patrons to effectively use new technologies. As highlighted by Hsieh (2020), such programs are essential for closing the digital divide and ensuring that all community members can access library resources.
    - Example: The Miami-Dade Public Library System provides regular digital literacy classes, equipping patrons with skills to navigate online resources and tools (Miami-Dade Public Library, 2022).
3. **Create Collaborative Spaces for Innovation**
    - Libraries should establish maker spaces or innovation labs that provide access to tools such as 3D printers, VR equipment, and software for coding. These spaces encourage hands-on learning and creativity. According to O'Connor (2019), such environments foster collaboration and community engagement.
    - Example: The San Francisco Public Library's Maker Lab allows patrons to explore various technologies and participate in hands-on workshops (San Francisco Public Library, 2020).
4. **Leverage Partnerships with Local Tech Companies**
    - Collaborating with local technology firms and educational institutions can enhance libraries' capacity to implement new technologies. Partnerships can provide funding, expertise, and resources. As noted by Leach and McTavish (2018), such collaborations can lead to innovative programming that meets community needs.
    - Example: The New York Public Library partnered with local tech startups to offer coding boot camps and tech workshops, thereby enhancing its service offerings (New York Public Library, 2021).
5. **Implement User-Centric Design Principles**
    - Libraries should adopt user-centric design principles when developing new services or technologies. Engaging patrons in the design process can lead to more relevant and effective solutions. Research by Garbutt (2021) emphasizes the importance of user feedback in service design.
    - Example: The Seattle Public Library utilized patron feedback to redesign its website, resulting in a more user-friendly interface that better meets community needs (Seattle Public Library, 2020).
6. **Utilize Data Analytics for Decision-Making**
    - Libraries can harness data analytics to assess service usage and inform strategic decisions. By analyzing data, libraries can identify trends, evaluate program effectiveness, and make informed adjustments. McClure and Joseph (2017) discuss how data-driven decision-making enhances library services.
    - Example: The Toronto Public Library uses analytics to track attendance at events and workshops, allowing for more effective programming (Toronto Public Library, 2019).
7. **Promote Continuous Professional Development for Staff**
    - Ensuring that library staff receive ongoing training in emerging technologies is crucial. Professional development programs should focus on both technical skills and customer service. According to Hiller (2019), well-trained staff can better assist patrons in navigating new technologies.
    - Example: The American Library Association offers various training resources and workshops to support library staff in technology integration (ALA, 2022).
8. **Engage in Community Outreach and Feedback**
    - Actively seeking input from the community through surveys, focus groups, and public forums can help libraries understand local needs and preferences. Engaging with patrons allows libraries to tailor services effectively. As emphasized by Elliott and Trivette (2018), ongoing community engagement fosters a responsive library environment.
    - Example: The Los Angeles Public Library conducts regular community forums to gather feedback and inform service development (Los Angeles Public Library, 2020).

Integrating emerging technologies into public libraries requires a strategic approach that prioritizes community needs, fosters innovation, and supports continuous improvement. By developing comprehensive integration plans, enhancing digital literacy training, creating collaborative spaces,

leveraging partnerships, implementing user-centric designs, utilizing data analytics, promoting staff development, and engaging in community outreach, libraries can effectively navigate the challenges and opportunities presented by technology.

Exploration of the staff development needs for public libraries, particularly in the context of integrating emerging technologies.

21.7 Exploring Staff Development Needs in Public Libraries

1. **Continuous Technology Training**
    - Staff members must be equipped with up-to-date skills related to emerging technologies to effectively assist patrons. Continuous training programs focused on specific tools and software can empower staff to engage confidently with new resources. According to Hiller (2019), regular technology training is critical for enhancing staff competence and improving user support.
    - Example: The Maryland State Library offers a comprehensive training program that includes workshops on new technologies and digital services (Maryland State Library, 2022).
2. **Digital Literacy Instruction**
    - As libraries increasingly focus on digital literacy initiatives, staff training should emphasize pedagogical strategies for teaching these skills to patrons. Effective digital literacy training can help staff provide meaningful guidance to users. Hsieh (2020) argues that library staff must be well-prepared to teach digital literacy in various formats, including one-on-one assistance and group workshops.
    - Example: The Chicago Public Library provides professional development focused on digital literacy instruction techniques, helping staff effectively teach patrons (Chicago Public Library, 2021).
3. **Customer Service Skills**
    - As libraries evolve, the need for strong customer service skills becomes paramount. Staff should be trained not only in technology but also in how to effectively communicate with and support diverse community members. As noted by Elliott and Trivette (2018), exceptional customer service enhances patron satisfaction and fosters a positive library experience.
    - Example: The American Library Association offers workshops on customer service best practices, emphasizing the importance of empathy and communication in library settings (ALA, 2022).
4. **Collaboration and Teamwork**
    - Developing collaborative skills among staff is crucial, especially when implementing new technologies and services that require team effort. Training in project management and collaborative tools can enhance teamwork. McClure and Joseph (2017) highlight that effective collaboration leads to more successful technology integration and service delivery.
    - Example: The New York Public Library encourages interdepartmental collaboration by hosting team-building workshops and cross-training sessions (New York Public Library, 2021).
5. **Cultural Competence and Inclusivity Training**
    - Staff should be trained in cultural competence to better serve diverse populations. Understanding the cultural backgrounds and needs of various community groups enables staff to create inclusive environments. As described by Bennett (2019), training in cultural competence helps libraries cater to underserved communities effectively.
    - Example: The San Francisco Public Library offers diversity and inclusion training programs aimed at enhancing staff understanding of cultural dynamics within the community (San Francisco Public Library, 2020).

6. **Professional Development Opportunities**
    - Libraries should promote access to external professional development resources, including conferences, webinars, and online courses. Providing staff with opportunities to learn from industry leaders can inspire innovation and growth. Hiller (2019) stresses that ongoing professional development is vital for fostering a culture of learning within libraries.
    - Example: The Public Library Association's annual conference includes sessions on the latest trends in library technology and services, providing valuable learning opportunities for staff (PLA, 2022).
7. **Feedback and Evaluation Mechanisms**
    - Implementing feedback systems to assess staff training effectiveness can help libraries refine their professional development offerings. Regular evaluations can ensure that training meets the evolving needs of both staff and patrons. According to Hsieh (2020), using feedback to inform training programs fosters a culture of continuous improvement.
    - Example: The Toronto Public Library conducts annual surveys to gather feedback from staff about their professional development needs and interests, allowing for responsive training offerings (Toronto Public Library, 2021).

Addressing the staff development needs of public libraries is essential for successfully integrating emerging technologies and enhancing service delivery. By focusing on continuous technology training, digital literacy instruction, customer service skills, collaboration, cultural competence, professional development opportunities, and feedback mechanisms, libraries can empower their staff to meet the diverse needs of their communities effectively.

Exploration of strategies for fostering collaboration in public libraries, especially in the context of integrating emerging technologies.

21.8 Fostering Collaboration in Public Libraries

1. **Establish Partnerships with Local Organizations**
    - Collaborating with local schools, nonprofits, and community organizations can enhance the library's capacity to provide relevant programs and services. Partnerships enable libraries to leverage external expertise and resources. According to Leach and McTavish (2018), such collaborations can lead to innovative programming that addresses community needs.
    - Example: The Seattle Public Library has partnered with local schools to provide after-school tutoring programs, effectively supporting student success (Seattle Public Library, 2020).
2. **Create Interdepartmental Teams**
    - Forming cross-functional teams within the library encourages staff from different departments to collaborate on projects, share knowledge, and develop innovative services. As noted by McClure and Joseph (2017), interdepartmental collaboration can enhance creativity and lead to more holistic service delivery.
    - Example: The Chicago Public Library initiated a project team that included staff from technology, programming, and outreach departments to develop a new digital literacy initiative (Chicago Public Library, 2021).
3. **Host Community Engagement Events**
    - Organizing events that bring together library staff, patrons, and community members can foster a collaborative spirit. These events allow for idea-sharing and collective problem-solving. Elliott and Trivette (2018) emphasize the importance of community engagement in creating responsive library services.
    - Example: The Denver Public Library hosts regular community forums where patrons can discuss their needs and collaborate with library staff on service development (Denver Public Library, 2021).
4. **Utilize Technology for Collaboration**
    - Leveraging collaborative technologies such as project management tools, shared digital workspaces, and communication platforms can enhance teamwork among library staff.

Tools like Slack or Trello facilitate real-time collaboration, making it easier for teams to coordinate projects and share information. As highlighted by O'Connor (2019), technology can play a crucial role in enabling effective communication and collaboration.
    - Example: The New York Public Library adopted a project management tool to streamline communication and collaboration among staff involved in technology integration projects (New York Public Library, 2021).
5. **Engage in Professional Networking**
    - Encouraging staff to participate in professional associations and networking events can expose them to best practices and innovative ideas from other libraries. Networking fosters a culture of collaboration beyond the library's walls. Hiller (2019) argues that professional networks enhance collaboration by sharing resources and expertise.
    - Example: The Public Library Association's annual conference provides opportunities for staff to connect with peers and explore collaborative projects (PLA, 2022).
6. **Develop Collaborative Programs**
    - Creating joint programs with community organizations allows libraries to address local issues and enhance service delivery. Collaborative programs can pool resources and expertise, making them more impactful. According to Bennett (2019), such initiatives can strengthen community ties and improve library visibility.
    - Example: A library in Los Angeles partnered with local health organizations to provide health education workshops, combining library resources with community expertise (Los Angeles Public Library, 2020).
7. **Foster a Culture of Open Communication**
    - Encouraging open communication among staff promotes a collaborative atmosphere. Regular staff meetings, brainstorming sessions, and feedback opportunities can help build trust and facilitate idea sharing. McClure and Joseph (2017) highlight that an open communication culture can enhance collaboration and service innovation.
    - Example: The Toronto Public Library holds monthly staff meetings to discuss ongoing projects and solicit input from all team members (Toronto Public Library, 2021).

Fostering collaboration in public libraries is vital for successfully integrating emerging technologies and enhancing community services. By establishing partnerships, creating interdepartmental teams, hosting community events, utilizing collaborative technology, engaging in professional networking, developing joint programs, and promoting open communication, libraries can cultivate a collaborative environment that benefits both staff and patrons

21.9 Emerging Technologies in Public Libraries

Emerging technologies have altered the way information is accessed and provided in public libraries today and have also impacted the way that traditional public library functions such as cataloguing and classification, collection development, management of resources and rendering of reference services are carried out. Emerging technologies have also had impact on the expectations of public library users which cut across every strata of the society and have changed the way that public libraries now render their services. These assertions are supported by Owate & Iroeze (2023) who stated that emerging technologies play a very significant role in transforming the landscape of all types of libraries operated and the manner in which information professionals carry out their function, in the same vein Emumejakpor & Egharevba (2022) asserted that new and emerging technologies are now being used to perform the age long role of libraries which have been to acquire, organize, preserve and disseminate all forms of information resources to users within the shortest possible time.

The utilization of emerging technologies has become influential trend in changing how library and information services are being delivered across the world today. Libraries of all kinds, especially public libraries now find themselves in an effort to keep abreast of the needs of the users, utilize emerging technologies in providing services to their users. This means having knowledge of what services the community needs and being able to provide access and support for those services using emerging technologies. Libraries must make revolutionary and permanent changes in the way public libraries and

information services are defined and delivered if they are to remain essential to the communities they serve, provide leadership for the public they serve, and help shape the information society of the future.

The continuous emergence of new technologies have totally transformed the practice of library and information profession all over the world and the public library is not left out, emerging technology undoubtedly has brought a wave of innovations to the way and manner public library services are rendered today. Sahabi & Otobo, (2021) asserted that it is an open-secret that the impact of new and emerging technologies on library service delivery has profound implication on the social and economic development.Ajibero (2012) emphasized that "woe betide the nation that fails to build and to indigenize its information infrastructure in order to exploit the immense benefits of the constantly changing hardware and software of technologies" and the public library must be in the forefront of using emerging technologies to render its services.

Emerging technologies and the availability of expanding information resources have altered the literary patterns and content of libraries from a customary focus on internal functioning and standard printed matter to an emphasis on virtual information resources and digital network access. A great deal of public library services in this area now focus on manipulating access to information that is not actually housed within the library. Such technology-centered information facilitation includes online reference services, databases, interlibrary loans, information delivered to a patron from a home computer, and diverse electronic resources (Saibakumo, 2021). New technologies are emerging in all fields of human endeavours, and its influence on how things are done differently cannot be over emphasized, from trade to healthiness, and from education to entertainment (Izevbekhai & Egharevba, 2020) and the library sector which the public library is a major part of, is clearly part of the human endeavours of this influential power of new and emerging technologies.

With the use of emerging trends and technologies in library service delivery, library services are being rendered more efficiently and effectively. For instance, Egharevba & Anaehobi (2017) stated that queries from library users are attended to within a very short period of time and reference services which were formerly rendered face-to-face between the library users and the Reference Librarians have gone digital and now termed e-reference services, reference services in library can now be rendered without face to face interface between users and librarians. The usage of these emerging technologies has given libraries salient opportunities to leverage on the utilization of much modern digital technologies to seemingly develop new approaches and processes and services to meet the ever growing demand of its committed users. Saibakumo (2021) asserted that today, emerging technologies in libraries offer opportunity for public libraries to be more innovative in its service delivery to their patrons and render rapid and efficient access to information. This call has braved public libraries to adjust from their traditional service delivery to meet the expected needs of library users on the information led revolution because they are responsible for managing digital resources, databases, and electronic systems in the library (Ukaegbu & Okwu 2022). According to Shynee (2023) one of the changes emerging technology has brought to public library is that library catalogs are now available online. This means that people can search for and find books and other materials from anywhere in the world. Public libraries have also digitized their collections, making it possible to access them remotely. In addition, many public libraries now offer e-books and other digital resources. Public libraries are now offering more than just books and printed materials, they now offer a variety of programs and services aimed at meeting the needs of their communities. For example, many public libraries now offer free Wi-Fi, computer classes, and even 3D printers. Some libraries also work with community partners to provide job training or ESL classes.

21.10 Funding of Public Libraries

Public libraries according to IFLA/UNESCO Guidelines (2001) are primarily funded by government (local, regional and national) with tax payers' money and with the backing of legislation. Outside government funding, public libraries can be funded through the following; Support from individuals: Individual members of the society, especially influential members of the society can donate books and other materials to the public libraries. Some wealthy members of the public can even fund the building and renovation of the public library building to enable users have conducive environment for reading.

Support from organizations: Local and international organizations support public libraries by donating books and other library materials to them. Some international and local donors are Emeka Offor Foundation, Book Aid International, Book for Africa, African Library Project, etc.
Volunteering at a library: Young school leavers and students could volunteer to work on part time with public libraries in order to cover up for shortage of man-power.

21.11 Conclusion

Public libraries are open and free to all without any discrimination and they are wholly designed for the purpose of rendering information services to the general public, irrespective of status, occupation, sex, age and these services are meant to be free or attract little fee, public libraries serves clients with diverse interests and varying levels of literacy. Public libraries are considered as agents of social, political and cultural change in any society and provide a wide range of readership than any other type of library. The general public is expected to make effective and efficient use of public libraries to satisfy their information and research needs.

Today, public libraries are utilizing emerging technologies to effectively and efficiently deliver their services and they have indulged in digital service delivery through organizing online exhibitions, describing the content on the websites and the application of the “Lets Read Together” online campaign. Efforts have also been made to boost access to library resources including online and offline by increasing the number of electronic resources. Virtual Reference Services (VRS) is another technology that is introduced in public libraries, the virtual reference technique is mostly used in communicating the information needs of the users of the public libraries in communities they serve.

The use of emerging technologies in library automation like cloud computing, virtual reality, social network websites technologies, OPAC, and barcode technology emerged as a key role to enhance public libraries service delivery and to keep public libraries relevant in this digital age.

As public libraries navigate the complexities of emerging technologies, they must redefine their roles to continue serving as essential resources in their communities. By addressing the challenges of resource limitations, the digital divide, and changing user expectations, libraries can transform into dynamic centers for learning, innovation, and community engagement. The integration of technology should not only enhance library services but also empower patrons and foster a culture of inclusivity and lifelong learning.

21.12 Recommendations

Based on the analysis presented in this paper, the following recommendations are proposed:

1. **Strategic Funding Initiatives**: Libraries should pursue diverse funding sources, including grants, partnerships, and community fundraising, to support the acquisition and implementation of emerging technologies.
2. **Digital Literacy Programs**: Libraries should develop and promote digital literacy initiatives aimed at equipping all community members with the skills necessary to navigate and utilize technology effectively.
3. **User-Centric Service Design**: Implement feedback mechanisms to continuously assess user needs and preferences, allowing libraries to adapt services and technologies accordingly.
4. **Professional Development**: Libraries must prioritize ongoing training and professional development for staff, ensuring they are equipped to support patrons in using new technologies.
5. **Collaborative Community Programs**: Establish partnerships with local organizations, educational institutions, and tech companies to create collaborative programs that leverage shared resources and expertise, fostering innovation and community involvement.

By embracing these recommendations, public libraries can effectively redefine their services and enhance their role as pivotal institutions in the digital age, ensuring they remain accessible, relevant, and engaged with their communities.

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