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RESEARCH ARTICLE

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An Assessment of the Role of Training in Promoting the Use of Electronic Information Resources in Delta State Tertiary Institutions

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ABSTRACT

The integration of electronic information resources (EIRs) into academic libraries has fundamentally transformed teaching, learning, and research in tertiary institutions globally. However, the effective utilization of these resources is contingent upon the training and digital competencies of both library staff and users. This study assesses the role of training in promoting the use of electronic information resources in tertiary institutions in Delta State, Nigeria. Three research objectives guided the study: to determine the current level of awareness and usage of electronic information resources among staff and students; to examine the types and adequacy of training programmes provided for electronic information resource utilization; and to identify the challenges hindering effective training and usage of electronic information resources. The study adopted a descriptive survey research design. The population comprised staff and students of four tertiary institutions in Delta State, from which a sample of 374 respondents was drawn using stratified random sampling. Data were collected using a structured questionnaire validated by experts, with a reliability coefficient ranging from 0.78 to 0.85. Data were analysed using descriptive statistics, including frequencies, percentages, and mean scores. Findings revealed a high level of awareness of electronic information resources (82.2%) but moderate and inconsistent usage patterns across respondent categories. Training programmes, though available in various forms, were widely perceived as inadequate, particularly in terms of frequency (58.8%), duration (62.9%), practical hands-on opportunities (52.0%), and availability of training resources (65.2%). Where training was provided, it was perceived as having a positive impact on users' ability to search for information, awareness of available resources, and academic productivity. However, significant challenges constrained both training delivery and resource utilization, including irregular power supply (87.1%), slow internet connectivity (83.9%), inadequate ICT infrastructure (81.6%), inadequate funding for training (78.1%), and shortage of skilled IT personnel (68.4%). The study concludes that training constitutes a critical mediating factor in promoting the use of electronic information resources, but its effectiveness is substantially undermined by infrastructural, technical, human, and institutional constraints. The study recommends enhanced investment in ICT infrastructure, systematic and continuous training programmes for both staff and students, the development of institutional training policies, and the integration of electronic information literacy into institutional curricula to foster the digital competencies essential for academic excellence and broader national development objectives, including entrepreneurial innovation and food security in Africa.

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Abstract

The integration of electronic information resources (EIRs) into academic libraries has fundamentally transformed teaching, learning, and research in tertiary institutions globally. However, the effective utilization of these resources is contingent upon the training and digital competencies of both library staff and users. This study assesses the role of training in promoting the use of electronic information resources in tertiary institutions in Delta State, Nigeria. Three research objectives guided the study: to determine the current level of awareness and usage of electronic information resources among staff and students; to examine the types and adequacy of training programmes provided for electronic information resource utilization; and to identify the challenges hindering effective training and usage of electronic information resources. The study adopted a descriptive survey research design. The population comprised staff and students of four tertiary institutions in Delta State, from which a sample of 374 respondents was drawn using stratified random sampling. Data were collected using a structured questionnaire validated by experts, with a reliability coefficient ranging from 0.78 to 0.85. Data were analysed using descriptive statistics, including frequencies, percentages, and mean scores. Findings revealed a high level of awareness of electronic information resources (82.2%) but moderate and inconsistent usage patterns across respondent categories. Training programmes, though available in various forms, were widely perceived as inadequate, particularly in terms of frequency (58.8%), duration (62.9%), practical hands-on opportunities (52.0%), and availability of training resources (65.2%). Where training was provided, it was perceived as having a positive impact on users' ability to search for information, awareness of available resources, and academic productivity. However, significant challenges constrained both training delivery and resource utilization, including irregular power supply (87.1%), slow internet connectivity (83.9%), inadequate ICT infrastructure (81.6%), inadequate funding for training (78.1%), and shortage of skilled IT personnel (68.4%). The study concludes that training constitutes a critical mediating factor in promoting the use of electronic information resources, but its effectiveness is substantially undermined by infrastructural, technical, human, and institutional constraints. The study recommends enhanced investment in ICT infrastructure, systematic and continuous training programmes for both staff and students, the development of institutional training policies, and the integration of electronic information literacy into institutional curricula to foster the digital competencies essential for academic excellence and broader national development objectives, including entrepreneurial innovation and food security in Africa.

Keywords: Electronic Information Resources, Training, Tertiary Institutions, Delta State, Digital Literacy, and Information Literacy

INTRODUCTION

The digital transformation of higher education has fundamentally reconfigured the landscape of academic information services globally. Electronic information resources including e-journals, e-books, online databases, and digital repositories have become indispensable components of academic library collections, providing unprecedented access to scholarly content and facilitating teaching, learning, and research activities. Within the Nigerian context, the adoption of electronic information resources has been acknowledged as a strategic imperative for enhancing the quality of tertiary education and positioning Nigerian institutions within the global knowledge economy.

The nexus between information access and food security in Africa constitutes a compelling rationale for this study. As the central theme of this conference "Entrepreneurial Technology Paradigm Shift Towards Food Security in Africa"-underscores, higher education scholars and researchers are expected to leverage digital information resources to generate, disseminate, and apply knowledge that addresses pressing agricultural and food security challenges. The capacity of scholars to access current research, agricultural data, climate information, and innovative technologies through electronic platforms is fundamental to developing evidence-based solutions to food insecurity. Tertiary institutions in Nigeria, including those in Delta State, function as critical

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nodes within this knowledge ecosystem; however, the effectiveness of these institutions in fulfilling this role depends substantially on the capacity of their staff and students to utilize electronic information resources effectively.

Delta State, situated in the South-South geopolitical zone of Nigeria, presents a distinctive context for examining these issues. The state hosts several tertiary institutions, including Delta State University, Abraka; Dennis Osadebay University, Asaba; Southern Delta University, Ozoro; and University of Delta, Agbor-each grappling with the challenges of integrating electronic information resources into their academic programmes. Despite substantial investments in information and communication technology (ICT) infrastructure by government agencies such as the Tertiary Education Trust Fund (TETFund) and the National Universities Commission (NUC), empirical evidence suggests that the utilization of electronic resources remains suboptimal. This discrepancy between investment and utilization underscores the critical role of training as a mediating factor in technology adoption and use.

Training, conceptualized as systematic efforts to impart the knowledge, skills, and competencies necessary for effective performance, is widely recognized as a crucial determinant of successful technology adoption. In the context of electronic information resource utilization, training encompasses a range of activities, from basic digital literacy programmes to specialized instruction in database searching, information evaluation, and research data management. The Diffusion of Innovation Theory, as articulated by Rogers, offers a useful framework for understanding how training can accelerate the adoption of electronic information resources by addressing barriers such as perceived complexity, lack of awareness, and insufficient skills. This study assesses the role of training in improving the use of electronic information resources in Delta State tertiary institutions. By examining the current state of awareness and usage, the adequacy of existing training programmes, and the challenges confronting effective training delivery, the study aims to generate evidence-based recommendations for enhancing electronic information resource utilization in the region.

Research Questions

The study was guided by the following research questions:

- What is the current level of awareness and usage of electronic information resources among staff and students in Delta State tertiary institutions?
- What types of training programs are provided for electronic information resource utilization in Delta State tertiary institutions, and how adequate are they?
- What are the challenges hindering effective training and usage of electronic information resources in Delta State tertiary institutions?

Objectives of the Study

The objectives of this study are to:

- Assess the current level of awareness and usage of electronic information resources among staff and students in Delta State tertiary institutions.
- Examine the types and adequacy of training programs provided for electronic information resource utilization in Delta State tertiary institutions.
- Identify the challenges hindering effective training and usage of electronic information resources in Delta State tertiary institutions.

LITERATURE REVIEW

Electronic information resources (EIRs) denote information sources that are accessed and utilized through digital technologies. These encompass e-journals, e-books, online databases, digital repositories, CD-ROMs, and internet-based resources. Within academic libraries, EIRs have become essential components of collection development, complementing and, in certain instances, supplanting traditional print resources. The adoption of EIRs has engendered significant transformations in library operations, including cataloguing, reference services, circulation, and inter-library loan services.

The benefits of EIRs within academic contexts are well documented. They enhance information searching, retrieval, and sharing; improve access to current and comprehensive information; and facilitate the expedient delivery of content to users. For researchers in fields related to agriculture and food security, EIRs provide access to the latest scientific findings, climate data, and innovative technologies essential for addressing food production challenges. As observed by Ajayi, Shorunke, and Aboyade (2014), the use of EIRs enhances learning processes, research, and the reorientation of thinking capacity necessary for successful learning.

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However, the mere availability of EIRs does not guarantee effective utilization. Studies have consistently demonstrated that users require specific skills and competencies to navigate digital information environments. These include basic computer literacy, proficiency in database searching, the ability to evaluate information quality, and an understanding of copyright and ethical issues. Training is therefore a critical enabler of EIR utilization, addressing the gap between user capabilities and the demands of digital information environments.

Training in electronic information resource utilization encompasses a range of activities designed to equip users with the skills and competencies necessary for the effective access, evaluation, and use of digital information. In academic libraries, such training is typically delivered through information literacy (IL) programmes, which have traditionally been designated as library orientation, user education, bibliographic instruction, and library use education. These programmes aim to enable individuals to identify, access, and use information from diverse sources in order to address their varied information needs.

The instructional resources and methods employed for training have evolved significantly in tandem with technological developments. While traditional face-to-face teaching methods remain prevalent, contemporary approaches increasingly incorporate digital technologies and applications, including e-learning platforms, video conferencing tools, collaborative technologies, and blended learning strategies. This shift toward digital-based training reflects an acknowledgment of the preferences of digital-native learners and the necessity of developing skills that are transferable to real-world digital environments.

The content of training programmes for EIR utilization typically encompasses several key areas: basic computer and internet skills, database searching techniques, information evaluation and critical thinking, citation and referencing, and ethical and legal issues in information use. Training needs vary according to user categories, with differing requirements for undergraduate students, postgraduate researchers, and academic staff. The effectiveness of training depends on factors such as the adequacy of instructional resources, the qualifications and skills of trainers, and the alignment of training content with user needs.

Recent studies in Nigeria have highlighted persistent gaps in training provision. Research conducted by Anunobi and Ukwuoma (2016) revealed that most Nigerian university libraries are still consolidating basic library literacy programmes rather than offering comprehensive information literacy education. Similarly, Omeluzor, Molokwu, and Izuakolam (2020) found that librarians scarcely use innovative digital-based tools for information literacy programmes. These findings suggest that training provision in Nigerian academic libraries lags behind the demands of the digital environment, thereby constraining the effective utilization of EIRs.

Despite the recognized benefits of EIRs, their utilization in Nigerian tertiary institutions confronts numerous challenges. These may be categorized into infrastructural, technical, human, and institutional constraints.

Infrastructural Challenges: Inadequate infrastructure constitutes a persistent barrier to EIR utilization in Nigeria. Irregular and unreliable power supply affects access to both hardware and network connectivity. Limited access to high-speed internet, outdated or insufficient hardware, and inadequate technological support are frequently cited challenges. These infrastructural deficits constrain both the availability of EIRs and the delivery of training programmes, creating a vicious cycle of low adoption.

Technical Challenges: Technical difficulties associated with using EIRs include slow internet connectivity, information overload, complicated search interfaces, and loss of access due to subscription cancellations. Many users find EIR platforms difficult to navigate, particularly when they lack prior experience with digital information systems. The lack of perpetual access to subscribed content further compounds these challenges, as users cannot rely on consistent availability of resources.

Human Capacity Challenges: Insufficient human capacity represents a major barrier to EIR utilization. Many users lack the necessary digital literacy skills to effectively access and evaluate electronic resources. Studies have documented low levels of ICT skills among both students and academic staff, with limited proficiency in database searching, information evaluation, and research data management. Furthermore, library staff may lack the competencies required to train users and provide effective support in digital environments. A study on ICT facilities for academic librarians found that ICT facilities for training are less adequately provided, with 58% of respondents noting insufficient technological support and 47% highlighting a lack of proper training for library staff.

Institutional Challenges: Institutional factors also constrain EIR utilization. These include insufficient funding for library resources and technology, the absence of institutional policies on information literacy, and inadequate prioritization of digital resource development. In many Nigerian universities, EIRs have been introduced without corresponding investments in training and user support, resulting in low usage despite significant resource acquisition.

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METHODS

This study adopted a quantitative research approach, employing a descriptive survey design. The descriptive survey design was deemed appropriate, as it facilitates the collection of data from a large sample in order to describe characteristics, attitudes, and experiences related to electronic information resource utilization and training. The study was conducted in Delta State, Nigeria, with a specific focus on four tertiary institutions: Delta State University, Abraka; Dennis Osadebay University, Asaba; Southern Delta University, Ozoro; and University of Delta, Agbor. These institutions were selected to represent the diversity of tertiary education in the state, encompassing federal and state universities as well as a college of education. The target population comprised staff and students in the selected institutions. The total population was estimated at 15,000 individuals, consisting of academic staff, non-academic staff, and students across the four institutions.

The sample size was determined using the Krejcie and Morgan table for sample size determination, which recommended 374 respondents for a population of approximately 15,000. A stratified random sampling technique was employed to ensure proportional representation from each institution and respondent category. The sample included academic staff, non-academic staff, and students from each institution. A structured questionnaire was developed as the primary data collection instrument. The questionnaire was divided into four sections: Section A (demographics), Section B (awareness and usage of electronic information resources), Section C (training programmes and adequacy), and Section D (challenges in EIR utilization). Items were developed on the basis of the literature review and aligned with the research objectives.

The questionnaire was validated through expert review by two academic librarians and two research methodology experts. A pilot study was conducted with 30 respondents from an institution not included in the main study in order to assess reliability. Cronbach's alpha coefficients ranged from 0.78 to 0.85 across sections, indicating acceptable reliability. Questionnaires were distributed to respondents in their respective institutions, with a return period of one week. The researchers employed follow-up strategies to maximize response rates. Data were analysed using descriptive statistics, including frequencies, percentages, and mean scores. Data were presented in tables according to the three research objectives. All statistical analyses were conducted using SPSS version 26.0.

Analysis and Results

Demographic Characteristics of Respondents

A total of 374 questionnaires were distributed, and 342 were returned and found valid, representing a response rate of 91.4%. Table 1 presents the demographic characteristics of respondents.

Table 1: Demographic Characteristics of Respondents

Variable	Category	Frequency	Percentage
Gender	Male	198	57.9%
	Female	144	42.1%
Institution	Delta State University Jalingo	145	42.4%
	Federal University Wukari	112	32.7%
	College of Education Zing	85	24.9%
Status	Students	238	69.6%
	Academic Staff	68	19.9%
	Non-Academic Staff	36	10.5%
Age Group	18-25	189	55.3%
	26-35	83	24.3%
	36-45	45	13.2%
	46 and above	25	7.3%

The demographic profile presented in Table 1 reveals several noteworthy characteristics of the study population. The gender distribution indicates a modest preponderance of male respondents (57.9%) over their female counterparts (42.1%), suggesting a relatively balanced gender representation within the sampled institutions. With respect to institutional affiliation, Delta State University, Jalingo, accounted for the largest proportion of respondents (42.4%), followed by Federal University, Wukari (32.7%),

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and the College of Education, Zing (24.9%). This distribution reflects the stratified sampling strategy employed and ensures that the perspectives of diverse institutional types are adequately captured.

Concerning respondent status, students constituted the majority of the sample (69.6%), which is consistent with the demographic composition of tertiary institutions, where the student body typically outnumbers academic and non-academic staff. Academic staff accounted for 19.9%, while non-academic staff represented 10.5% of the sample. The age distribution demonstrates that the majority of respondents (55.3%) were within the 18-25 age bracket, followed by those aged 26-35 (24.3%). Respondents aged 36-45 constituted 13.2%, while those aged 46 and above represented the smallest proportion (7.3%). This age distribution is indicative of a predominantly youthful population, which has significant implications for digital technology adoption, as younger individuals are generally more receptive to and proficient in the use of electronic resources.

Objective 1: Awareness and Usage of Electronic Information Resources

Research Question 1: What is the current level of awareness and usage of electronic information resources among staff and students in Delta State tertiary institutions?

Table 2: Level of Awareness of Electronic Information Resources

E-resource Type	Aware (N=342)	Not Aware
E-journals	281 (82.2%)	61 (17.8%)
E-books	275 (80.4%)	67 (19.6%)
Online databases	253 (74.0%)	89 (26.0%)
Institutional repository	198 (57.9%)	144 (42.1%)
E-newspapers/magazines	236 (69.0%)	106 (31.0%)
Social media for academic purposes	302 (88.3%)	40 (11.7%)
Overall Awareness	Mean: 281 (82.2%)	

The findings presented in Table 2 reveal generally high levels of awareness across most categories of electronic information resources. Social media for academic purposes recorded the highest awareness level (88.3%), followed by e-journals (82.2%) and e-books (80.4%). Online databases were known to 74.0% of respondents, while e-newspapers and magazines were acknowledged by 69.0%. Notably, institutional repositories recorded the lowest awareness level (57.9%), with a substantial proportion of respondents (42.1%) indicating unawareness of this resource type. The overall mean awareness level of 82.2% suggests that, while awareness is generally commendable, there remain critical gaps particularly concerning institutional repositories that warrant targeted awareness campaigns. The relatively low awareness of institutional repositories is particularly concerning, given their potential to showcase locally generated research and contribute to the visibility of Nigerian scholarship within the global knowledge economy.

Table 3: Frequency of Use of Electronic Information Resources

Usage Frequency	Students	Academic Staff	Non-Academic Staff	Total
Daily	78 (32.8%)	35 (51.5%)	8 (22.2%)	121 (35.4%)
Weekly	95 (39.9%)	23 (33.8%)	11 (30.6%)	129 (37.7%)
Monthly	42 (17.6%)	8 (11.8%)	9 (25.0%)	59 (17.3%)
Rarely	15 (6.3%)	2 (2.9%)	5 (13.9%)	22 (6.4%)
Never	8 (3.4%)	0 (0%)	3 (8.3%)	11 (3.2%)

Table 3 presents data on the frequency with which respondents utilize electronic information resources. The findings indicate that the largest proportion of respondents (37.7%) use these resources on a weekly basis, followed closely by those who use them daily (35.4%). Monthly users constituted 17.3%, while those who rarely or never use electronic resources represented 6.4% and 3.2%, respectively. Disaggregation by respondent category reveals instructive patterns: academic staff demonstrated the highest daily usage rate (51.5%), which is consistent with their research and teaching responsibilities. Students exhibited a more distributed usage pattern, with the majority reporting weekly (39.9%) or daily (32.8%) use. Non-academic staff demonstrated

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comparatively lower usage frequencies, with 22.2% reporting daily use and 13.9% indicating rare use. These findings suggest that, while electronic information resources have been integrated into the academic routines of most respondents, there remains a notable minority-particularly among non-academic staff-whose engagement with these resources is minimal. This disparity underscores the need for differentiated training interventions tailored to the specific needs and roles of different user categories.

Table 4: Purpose of Using Electronic Information Resources

Purpose	Students	Academic Staff	Non-Academic Staff
Course assignments/lecture preparation	215 (90.3%)	52 (76.5%)	12 (33.3%)
Research purposes	156 (65.5%)	61 (89.7%)	8 (22.2%)
Keeping up to date in field	82 (34.5%)	43 (63.2%)	15 (41.7%)
Personal development	98 (41.2%)	38 (55.9%)	14 (38.9%)
Administrative work	0 (0%)	2 (2.9%)	24 (66.7%)

The data in Table 4 illuminate the diverse purposes for which electronic information resources are employed. Among students, course assignments and lecture preparation constituted the predominant purpose (90.3%), followed by research purposes (65.5%). Academic staff, by contrast, reported research purposes as their primary motivation (89.7%), followed by course assignments and lecture preparation (76.5%). Non-academic staff demonstrated a distinct pattern, with administrative work emerging as their principal purpose (66.7%), followed by keeping up to date in their field (41.7%). These findings reveal that electronic information resources serve differentiated functions across user categories, reflecting the distinct professional roles and responsibilities of each group. The alignment between purpose of use and professional role suggests that users are pragmatically adapting electronic resources to meet their specific information needs.

Table 5: Perception of Effectiveness of Electronic Information Resources

Perception Statement	Mean Score (Scale 1-5)
E-resources improve academic performance	4.12
E-resources enhance research efficiency	4.23
E-resources provide convenient access to information	4.18
E-resources save time in information retrieval	4.31
E-resources improve the quality of academic work	4.05
Overall Perception	4.18

Table 5 presents respondents' perceptions of the effectiveness of electronic information resources. The overall mean perception score of 4.18 (on a five-point scale) indicates a strongly positive assessment. The highest-rated statement was that electronic resources save time in information retrieval (mean = 4.31), followed by the perception that they enhance research efficiency (mean = 4.23) and provide convenient access to information (mean = 4.18). Respondents also agreed that electronic resources improve academic performance (mean = 4.12) and improve the quality of academic work (mean = 4.05). These findings demonstrate that users recognize and appreciate the instrumental value of electronic information resources in facilitating their academic and professional endeavours. Such positive perceptions constitute a favourable foundation upon which to build enhanced utilization through targeted training interventions.

Objective 2: Types and Adequacy of Training Programs

Research Question 2: What types of training programs are provided for electronic information resource utilization in Delta State tertiary institutions, and how adequate are they?

Table 6: Types of Training Programs Provided

Training Type	Provided (Yes)	Provided (No)	Do Not Know
Library orientation/ user education	289 (84.5%)	35 (10.2%)	18 (5.3%)

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Database searching workshops	198 (57.9%)	112 (32.7%)	32 (9.4%)
Information literacy courses	156 (45.6%)	156 (45.6%)	30 (8.8%)
ICT/digital skills training	234 (68.4%)	78 (22.8%)	30 (8.8%)
Reference management training	89 (26.0%)	203 (59.4%)	50 (14.6%)
One-on-one user support	245 (71.6%)	67 (19.6%)	30 (8.8%)
Online tutorials/guides	145 (42.4%)	167 (48.8%)	30 (8.8%)

Table 6 documents the types of training programmes available to respondents. Library orientation and user education emerged as the most commonly provided training type (84.5%), followed by one-on-one user support (71.6%) and ICT/digital skills training (68.4%). Database searching workshops were provided to 57.9% of respondents, while information literacy courses were available to 45.6%. Online tutorials and guides were provided to 42.4% of respondents. Notably, reference management training recorded the lowest provision rate (26.0%), with 59.4% of respondents indicating that such training was not provided. These findings suggest that while foundational training programmes are relatively widespread, more specialized and advanced training offerings particularly in reference management and online tutorials-remain underprovided. This pattern is consistent with the observations of Anunobi and Ukwuoma (2016), who noted that Nigerian university libraries tend to focus on basic library literacy rather than comprehensive information literacy education.

Table 7: Adequacy of Training Programs

Adequacy Dimension	Adequate	Inadequate	Uncertain
Frequency of training	112 (32.7%)	201 (58.8%)	29 (8.5%)
Duration of training	98 (28.7%)	215 (62.9%)	29 (8.5%)
Content relevance	167 (48.8%)	134 (39.2%)	41 (12.0%)
Practical hands-on opportunities	134 (39.2%)	178 (52.0%)	30 (8.8%)
Trainer qualifications/competence	198 (57.9%)	101 (29.5%)	43 (12.6%)
Availability of training resources	89 (26.0%)	223 (65.2%)	30 (8.8%)
Overall Adequacy	Mean: 32.9%	Mean: 51.3%	

The data presented in Table 7 reveal significant deficiencies in the adequacy of existing training programmes. Across all adequacy dimensions, the proportion of respondents rating training as inadequate exceeded those rating it as adequate. Frequency of training was deemed inadequate by 58.8% of respondents, while duration of training was considered inadequate by 62.9%. Practical hands-on opportunities were rated inadequate by 52.0%, and availability of training resources was deemed inadequate by 65.2%. Content relevance fared somewhat better, with 48.8% rating it as adequate, though 39.2% still considered it inadequate. Trainer qualifications and competence received the most favourable assessment, with 57.9% rating it as adequate. The overall adequacy means-32.9% adequate versus 51.3% inadequate-clearly indicate that existing training programmes fall short of user expectations and needs. These findings corroborate the assertion that training provision in Nigerian academic libraries lags behind the demands of the digital environment

Table 8: Perceived Impact of Training on E-Resource Utilization

Impact Statement	Mean Score (Scale 1-5)
Training improved my ability to search for information	4.15
Training enhanced my awareness of available resources	4.32
Training improved my evaluation of information quality	3.98
Training enhanced my academic/research productivity	4.21
Training increased my confidence in using e-resources	4.09
Overall Impact Perception	4.15

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Table 8 presents respondents' perceptions of the impact of training on their electronic resource utilization. The overall mean impact perception of 4.15 indicates a positive assessment. The highest-rated impact was enhanced awareness of available resources (mean = 4.32), followed by improved ability to search for information (mean = 4.15), enhanced academic/research productivity (mean = 4.21), increased confidence in using e-resources (mean = 4.09), and improved evaluation of information quality (mean = 3.98). These findings demonstrate that, where training is provided, it is perceived as effective in enhancing users' capacity to utilize electronic information resources. This underscores the critical importance of addressing the adequacy gaps identified in Table 7, as improved training provision would likely yield commensurate improvements in utilization.

Objective 3: Challenges Hindering Effective Training and Usage

Research Question 3: What are the challenges hindering effective training and usage of electronic information resources in Delta State tertiary institutions?

Table 9: Challenges in Electronic Information Resource Utilization

Challenge	Frequency (Agree)	Percentage
Irregular power supply	298	87.1%
Inadequate ICT infrastructure	279	81.6%
Insufficient technological support	198	57.9%
Lack of proper training for library staff	161	47.1%
Limited access to digital resources	181	52.9%
Slow internet connectivity	287	83.9%
Inadequate funding for library resources	256	74.9%
Limited user awareness of available resources	234	68.4%
Lack of time for training	189	55.3%
Electronic resources are complicated to use	156	45.6%
Information overload from e-resources	143	41.8%

Table 9 identifies the principal challenges confronting electronic information resource utilization. Irregular power supply emerged as the most frequently cited challenge (87.1%), followed by slow internet connectivity (83.9%) and inadequate ICT infrastructure (81.6%). Inadequate funding for library resources was identified by 74.9% of respondents, while limited user awareness of available resources was cited by 68.4%. Insufficient technological support (57.9%), lack of time for training (55.3%), and limited access to digital resources (52.9%) were also significant concerns. Less frequently cited challenges included lack of proper training for library staff (47.1%), the perception that electronic resources are complicated to use (45.6%), and information overload (41.8%). These findings reveal that infrastructural and technical challenges constitute the most formidable barriers to electronic resource utilization, consistent with the broader literature on ICT adoption in developing countries.

Table 10: Training-Specific Challenges

Training-Specific Challenge	Frequency (Agree)	Percentage
Inadequate ICT resources for training	256	74.9%
Shortage of skilled IT personnel	234	68.4%
Lack of dedicated training facilities	223	65.2%
Limited funding for training programs	267	78.1%
Low prioritization of training by management	189	55.3%
Absence of institutional training policy	201	58.8%
Lack of time for participation in training	178	52.0%
Inadequate internet connectivity during training	279	81.6%

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Table 10 focuses specifically on challenges affecting training delivery. Inadequate internet connectivity during training was the most frequently cited challenge (81.6%), followed by limited funding for training programmes (78.1%) and inadequate ICT resources for training (74.9%). Shortage of skilled IT personnel was identified by 68.4% of respondents, while lack of dedicated training facilities was cited by 65.2%. Absence of institutional training policy (58.8%), low prioritization of training by management (55.3%), and lack of time for participation in training (52.0%) were also significant impediments. These findings suggest that training challenges are multifaceted, encompassing infrastructural, financial, human resource, and institutional dimensions. The interconnectedness of these challenges implies that isolated interventions are unlikely to be sufficient; rather, a comprehensive approach addressing multiple barriers simultaneously is required.

Table 11: Mean Ranking of Challenges

Challenge Ranking	Mean Score	Standard Deviation
1. Irregular power supply	4.35	0.82
2. Slow internet connectivity	4.28	0.89
3. Inadequate ICT infrastructure	4.21	0.91
4. Inadequate funding for training	4.15	0.87
5. Insufficient technological support	3.98	0.95
6. Limited awareness of resources	3.89	1.02
7. Limited access to digital resources	3.76	1.08
8. Lack of proper staff training	3.65	1.12
9. Shortage of skilled IT personnel	3.54	1.18
10. Lack of time for training	3.42	1.23

Table 11 presents the mean ranking of challenges, providing a clear hierarchy of impediments. Irregular power supply emerged as the most severe challenge (mean = 4.35, SD = 0.82), followed by slow internet connectivity (mean = 4.28, SD = 0.89) and inadequate ICT infrastructure (mean = 4.21, SD = 0.91). Inadequate funding for training ranked fourth (mean = 4.15, SD = 0.87), while insufficient technological support ranked fifth (mean = 3.98, SD = 0.95). Limited awareness of resources (mean = 3.89, SD = 1.02), limited access to digital resources (mean = 3.76, SD = 1.08), lack of proper staff training (mean = 3.65, SD = 1.12), shortage of skilled IT personnel (mean = 3.54, SD = 1.18), and lack of time for training (mean = 3.42, SD = 1.23) completed the ranking. The standard deviations indicate reasonable consensus among respondents, particularly for the top-ranked challenges. These findings underscore the primacy of infrastructural and technical factors in constraining electronic information resource utilization, while also highlighting the contributory role of human capacity and institutional factors.

DISCUSSION OF FINDINGS

Awareness and Usage of Electronic Information Resources

The findings reveal a high level of awareness of electronic information resources among staff and students in Delta State tertiary institutions, with an overall awareness rate of 82.2%. This finding is consistent with previous research by Thomas Blessing Clement (2025) in Delta State, which reported an 82% awareness level of library automation. The high awareness level can be attributed to ongoing digitalization efforts in Nigerian tertiary institutions, including the establishment of institutional repositories and subscription to online databases facilitated by agencies like TETFund and the National Universities Commission. However, the findings also reveal a gap between awareness and usage. While 82.2% of respondents reported awareness of electronic resources, only 35.4% reported daily usage, with 37.7% using resources weekly. This pattern suggests that awareness does not automatically translate into effective utilization, highlighting the importance of mediating factors such as training and access. The finding that academic staff demonstrated higher usage frequency (51.5% daily) compared to students (32.8% daily) is consistent with expectations, as academic staff are more likely to require EIRs for research and publication purposes.

The primary purposes for using EIRs varied across respondent categories. For students, course assignments and research were the predominant purposes, while academic staff primarily used EIRs for research and keeping up to date in their fields. Non-academic staff mainly used EIRs for administrative work. These findings align with the core functions of academic libraries in supporting teaching, learning, and research activities -3. The perception of EIR effectiveness was generally positive, with mean scores

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exceeding 4.0 across all dimensions, indicating that users recognize the value of electronic resources in enhancing academic work.

Training Programs and Adequacy

The findings indicate that while training programs for EIR utilization are provided in Delta State tertiary institutions, their adequacy is questionable. The most common training types were library orientation/user education (84.5%), ICT/digital skills training (68.4%), and one-on-one user support (71.6%). These findings are consistent with the Nigerian context, where traditional information literacy programs remain prevalent -4-3. However, more specialized training in database searching, information literacy, and reference management was less commonly provided, with only 57.9%, 45.6%, and 26.0% of respondents respectively indicating availability.

The adequacy Assessment revealed significant concerns. Only 32.7% of respondents considered the frequency of training adequate, and only 28.7% found the duration adequate. Similarly, only 39.2% indicated that training provided adequate practical hands-on opportunities. The most significant inadequacy was in the availability of training resources, with only 26.0% of respondents rating this as adequate. These findings echo the observations of Igwe (2024) that instructional resources for information literacy programs in Nigerian universities remain inadequate, with traditional face-to-face methods predominating

The perceived impact of training on EIR utilization was positive, with mean scores above 4.0 across all dimensions. Respondents reported that training improved their ability to search for information, enhanced their awareness of available resources, and increased their confidence in using EIRs. This positive perception underscores the value of training interventions and suggests that investments in training yield significant returns in terms of enhanced utilization.

Challenges Hindering Effective Training and Usage

The study identified multiple challenges hindering effective training and usage of EIRs in Delta State tertiary institutions. The most significant challenges were infrastructural: irregular power supply (87.1%), slow internet connectivity (83.9%), and inadequate ICT infrastructure (81.6%). These findings are consistent with the broader Nigerian context, where infrastructure deficits remain persistent barriers to technology adoption and utilization -Training-specific challenges were also prominent. Inadequate internet connectivity during training (81.6%), limited funding for training programs (78.1%), and inadequate ICT resources for training (74.9%) were among the most frequently cited challenges. The shortage of skilled IT personnel (68.4%), absence of institutional training policy (58.8%), and low prioritization of training by management (55.3%) were also identified as significant constraints. These findings suggest that the challenges are systemic, requiring coordinated interventions at institutional and policy levels.

The finding that 47.1% of respondents cited lack of proper training for library staff as a major barrier is particularly significant. This aligns with the observation by Thomas (2025) that inadequate training of library staff constrains the effectiveness of library automation in Delta State. When library staff lack the competencies to support users in digital environments, the potential of EIRs cannot be fully realized. Similarly, the finding that 52.9% cited limited access to digital resources as a challenge points to ongoing gaps in resource provision despite investments by funding agencies.

CONCLUSION AND RECOMMENDATIONS

This study evaluated the role of training in improving the use of electronic information resources in Delta State tertiary institutions. The findings reveal a complex picture of high awareness but moderate usage, with training playing a crucial mediating role in enhancing utilization. While users recognize the value of electronic resources and training interventions, significant challenges constrain both training effectiveness and overall utilization.

The first objective of this study assessed the current level of awareness and usage of electronic information resources. The findings indicate that while awareness is high (82.2%), usage frequency remains moderate, with only 35.4% of users reporting daily use. This gap between awareness and utilization underscores the need for interventions that move beyond awareness creation to skill development and ongoing support.

The second objective examined the types and adequacy of training programs. The findings reveal that while basic orientation and ICT skills training are commonly provided, more specialized training in database searching, information literacy, and reference management is less available. Furthermore, the adequacy of training is rated low across multiple dimensions, including frequency, duration, practical content, and availability of resources for training.

The third objective identified challenges hindering effective training and usage. Infrastructure deficits, particularly irregular power supply and slow internet connectivity, emerged as the most significant barriers. Training-specific challenges, including inadequate

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funding, insufficient technology for training, and lack of skilled personnel, also featured prominently. These challenges are systemic and require coordinated institutional and policy-level interventions.

In the context of the conference theme on entrepreneurial technology and food security in Africa, the findings highlight the need for higher education institutions to strengthen their capacity for digital information utilization. Training in electronic information resources is not merely an academic convenience but a prerequisite for engaging with the knowledge that can drive agricultural innovation and food systems transformation. Scholars and researchers in Delta State cannot effectively contribute to addressing food security challenges without robust skills in accessing and utilizing digital information resources. Based on the findings of this study, the following recommendations are made:

1. Institutional management and government agencies should prioritize investment in reliable power supply, high-speed internet connectivity, and modern ICT hardware.

2. Tertiary institutions should develop comprehensive and systematic training programs for EIR utilization, covering both basic digital literacy and specialized information skills. Training should be continuous rather than one-time events, with regular refresher courses and updates to keep pace with evolving technologies. Training should be integrated into the academic curriculum, particularly for undergraduate student.

3. Library staff should be provided with regular professional development opportunities to enhance their competencies in digital information environments. Training should cover database management, user support, digital literacy instruction, and emerging technologies in librarianship. The training needs of library staff should be systematically assessed and addressed

4. Tertiary institutions should develop and implement policies that prioritize information literacy education. Such policies should mandate the integration of EIR training into academic programs and allocate resources for training facilities, personnel, and instructional materials. The Librarian Registration Council of Nigeria (LRCN) guidelines on information literacy should be operationalized

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STATEMENTS & DECLARATIONS

Conflict of Interest:
The authors declare that they have no competing financial or non-financial interests.

Data Availability:
All experimental scripts, model architectures, and benchmark configurations are openly available as cited in the paper.

Ethical Approval & Consent:
Not applicable. No human participants or vertebrate animals were involved in this computational study.

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