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ADAPTING LIBRARY SERVICES TO MEET THE INFORMATION NEEDS OF DIVERSE STUDENT POPULATION IN THE ERA OF DISRUPTIVE TECHNOLOGIES

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The study investigated how university libraries in Nigeria are adapting library services to meet the information needs of a diverse student population, predominantly comprising Gen Zs in the era of disruptive technologies. A qualitative research approach was adopted in this study, using semi-structured interviews and purposive sampling to collect data from 25 librarians and library officers working in the Reference Section, Reader's Services Department and Automation Department from four federal institutions in Nigeria. The four federal institutions were selected because they have successfully integrated ICT into their library operations and offer tailored services to meet Gen Z's information needs. Using semi-structured interviews, Data was analyzed thematically. Findings revealed the emergence of new roles for librarians, including managing institutional repositories, promoting electronic resources, and providing IT support in academic libraries. Findings also revealed how the selected universities were using disruptive technologies such as artificial intelligence, machine learning, Makerspaces, and other innovative services to meet the academic, informational and recreational needs of their diverse population. The study concludes that libraries should be more proactive in providing fit-for-purpose services to the student population, especially the Gen Zs who form a majority of the student population in Nigerian universities. The study recommends that LIS professionals do away with outdated library service delivery practices that are no longer effective in meeting the needs of today's library users; reluctance to adopt new technologies and practices, and over-reliance on traditional library service. This research provides valuable insights into the transformation of library services for a diverse student population and proposes strategic recommendations for enhancing library services tailored to the needs of Gen Zs, from a developing country's context.

Keywords: Disruptive Technologies, Generation Z, Library Services, information needs, University Libraries, Information Needs

Introduction

Disruptive technologies are innovations that significantly alter or replace existing systems, practices, or markets. In libraries, these technologies are reshaping how information is accessed, stored, delivered, and interacted with. While offering exciting opportunities, they also challenge traditional roles and service models in every sector, including higher education. In higher education, a diverse student population, which includes individual differences (such as life experiences, learning styles, and personality) and group or social differences (such as race, socio-economic status, class, gender, sexual orientation, country of origin, ability, intellectual traditions, and other perspectives), fosters a plurality of perspectives. Such diversity creates an opportunity for students to come together, challenge each other's ideas, learn new perspectives and grow as individuals. It is such diversity that creates both richness and challenge within a campus setting. According to Sardi (2022), universities are dominated by four generations comprising baby boomers, Gen X, millennials, and Gen Zs. It is important to reiterate that the disruptive environment in which university libraries operate and provide their resources and services is one of the biggest challenges faced in engaging today's diverse student population. This may be due to the limited amount of high-quality attention and time students have to engage with what the library offers because disruptive technology is changing existing library practices by introducing new products, services, and service delivery mechanisms.

In addition to the challenges of the globally disruptive environment in institutions where libraries operate, libraries also face a fundamental shift amongst their diverse student population as a growing portion of undergraduate students are Generation Z with the acronym Gen Z. Generation Z, refers to individuals born between 1997 and 2012 into a world dominated by smartphones, social media and on-demand digital services often finds conventional library services outdated, rigid and less appealing. They differ from earlier generations in terms of attitudes, expectations, strengths, and weaknesses in their approach to the use of libraries and technology (Shorey, Chan, Rajendran, and Ang, 2021).

Gen Z is the first generation to have grown up in a world where the Internet is ubiquitous. Scholars refer to this group as the most diverse generation because they are digital natives possessing a high level of digital skills, the Google generation, and information curators (Edmond and Driskill 2019; Singjai, 2024). Moreover, Seemiller and Grace (2017) opined that Gen Zs have a “we-centric” attitude as opposed to the “me-centric” attitude among millennials. They are often portrayed as confident, self-expressive, connected and open to change. They treat their multi-tasking mobile phones almost like a body part. They embrace multiple modes of self-expression. They are inventive, creative, ambitious, bold, social, entrepreneurial and artistic (Wandhe, Dabre, Gaiki, Sirkirwar and Shirke, 2024). Since the diverse student population in a disruptive environment exhibits various traits, it is expedient that Library and Information Science (LIS) professionals recognise such traits and support students' learning and research needs (Becker, 2019). Interestingly, studies have reported that university libraries in the United States of America, Australia, Canada, the United Kingdom, China, and Africa have been deploying various products, services and technologies to meet the needs of the Gen Z population. However, empirical evidence from libraries in Africa remains inadequate in this regard.

Statement of the Problem

Globally, the rapid emergence of disruptive technologies such as artificial intelligence, cloud computing, mobile applications, digital libraries, and the provision of fit-for-purpose services via interactive media has significantly transformed the landscape of library service delivery in universities. While these innovations offer immense potential for enhancing the use of libraries and streamlining library operations, many libraries, especially in developing countries are struggling to adapt their traditional models to effectively

engage the Generation Z population, whose expectations are shaped by instant access, digital interactivity, and personalized user experiences. Despite the integration of digital tools in libraries, there still exists a disconnect between the

preferences of Gen Z users and the current capacity of libraries to provide responsive, user-centred and fit-for-purpose services, especially in university libraries in Nigeria. This gap may be connected with challenges such as limited funding, lack of digital infrastructure, inadequate staff training, and resistance to organizational change. As a result, many libraries risk becoming irrelevant to this digital-native generation, failing to meet their evolving academic, informational, and recreational needs. Therefore, there is an urgent need to investigate how university libraries in Nigeria can more effectively harness disruptive technologies to redesign their services in a way that aligns with the expectations, behaviours, and learning styles of Gen Z users.

Aim of the Study

This study aims to investigate how university libraries in Nigeria are adapting their services to meet the information needs of a diverse student population predominantly comprising Gen Zs in the era of disruptive technologies.

Research Questions

The study provides answers to the following research questions:

1. What role(s) are university libraries playing in providing fit-for-purpose services to a diverse student population in the era of disruptive technologies in Nigeria?
2. What type(s) of fit-for-purpose services are university libraries providing to a diverse student population in the era of disruptive technologies in Nigeria?
3. What is the future of Nigerian university libraries in a disruptive environment?
4. What are the challenges and/or opportunities posed by disruptive technologies to librarians working in university libraries in Nigeria?

Review of Related Literature

Understanding Generation Z

Generation Z is the first cohort to grow up entirely in the digital age. Their information behaviours are shaped by constant connectivity, mobile technologies, social media, and instant access to information. Gen Zs prefers visual content, values personalised user experiences and often relies on non-traditional sources like Google, YouTube, TikTok, Twitter, Facebook, LinkedIn, and other online communities for information gathering (Devi, Nurkamilah, Mazidah, Ilmi, Saefullah and Kurniasih, 2024). They also prioritise convenience over credibility and multimedia text; and their expectations of service providers, including libraries, are deeply rooted in speed, convenience, and digital fluency.

Research shows that Gen Zs are “communaholic,” that is, incredibly open-minded, not knowing the difference between friends they make online and friends they meet in person (Francis and Hoefel, 2018). More interestingly, Gen Zs exhibit characteristics such as nesting, blending, and multitasking. (Winter, 2019) notes that libraries are no longer to be seen as quiet places but rather as places of warmth and emotional safety, nesting and blending. By nesting, they fill study space with personal items and home comforts and turn that place into a den by consistently returning to that same area. By blending, this group of individuals use their study time to multitask by reading, using phones, and laptops, and chatting at the same time. Moreover, Gen Zs prefer to learn through auditory, visual and haptic means (touching and

feeling), and these learning styles exhibited by Gen Zs have serious implications for library service provision in the digital era. Specifically, some studies suggest that Gen Z users often bypass library services altogether, preferring Google, YouTube and social media platforms as primary information sources. The study of Head, Fister and MacMillan (2020) on student information-seeking behavior reveals that Gen Z tends to prioritise convenience when seeking information in libraries. The authors state that this category of users is comfortable navigating digital interfaces but may struggle with evaluating the credibility of sources. They also prefer a comfortable library area to either work alone or in collaboration with friends or peers.

In understanding Generation Z in the African context, they are also regarded as digital natives like their global counterparts, though their access to technology can be limited by socioeconomic disparities. Studies suggest that while Gen Z in urban areas has high mobile and social media usage, many still struggle with access to reliable internet, up-to-date devices, and digital skills training (Asamoah, 2020; Dezuanni & Osman 2024). The attributes of Gen Z are expected to propel libraries and librarians in creating cohesive online and blended library services for a diverse population of students. However, libraries in Africa are facing the challenges of meeting the academic, informational and recreational needs of this group while trying to bridge the digital divide and deploying strategies to remain relevant in the era of disruptive technologies.

Disruptive Technologies in Libraries

Disruptive technologies such as the Internet of Things (IoT), Smart Library Systems—IoT devices, chatbots, IoT-based sensors, and data analytic tools are permeating every sector, including libraries. The 4IR era is a time of disruption for libraries (Janse van Vuren, 2022). Library and Information Science (LIS) literature reveals how libraries in developed countries, such as the United States, United Kingdom, Canada and Germany have adopted technologies and actively reimagining their roles to remain relevant to Generation Z, a demographic defined by digital nativity, instant access to information, and a preference for interactive and personalized experiences.

Disruptive technologies have brought so much digital transformation to libraries in developed countries such that machine learning applications, artificial intelligence and robotics; Internet of Things, data analytics, 3D printing, big data, smartphones and other mobile devices and AI-powered language models such as ChatGPT, chatbots, Google Bard, etc are deployed to enhance library service delivery to Gen Z users in many campus settings. For example, at the University of London, university libraries meet the information needs of a diverse population through the provision of a live chat service instead of just the conventional reference services with an active social media presence. Similarly, at the Lancaster University Library, the library has transformed its space to include where students can read, socialise and relax. Additionally, the study by Kim (2019) states that the University of Rhode Island Library has responded positively to the wave of the disruptive technologies of the fourth industrial revolution by having an Artificial Intelligence Lab which provides intelligent experimental space and services for their diverse user population.

In response to the rise of disruptive technologies, there is no doubt that libraries in developing countries are embracing disruptive technologies not as threats but as opportunities to redefine their roles by enhancing accessibility, engagement, and learning outcomes for Gen Z users (Poole, 2020; Ombogo and Namande 2021; Wang, Zhang, Wang and Yuan, 2023). In Africa, however, the integration of disruptive technologies is unfolding, and the technologies of the 4IR are challenging traditional thinking and understanding of the concept of libraries. Various studies reveal that university libraries are rooted in a philosophy emphasising quiet study, physical collection, and face-to-face reference services (Tella, 2020). However, varying levels

of adoption of digital transformation in university libraries have been reported in LIS literature. For example, university libraries have integrated Learning Commons, thereby redefining their spaces and services.

According to Garoufali and Garoufallou (2022), the Learning Commons has revolutionised library environments, creating vibrant hubs that seamlessly integrate flexibility, technology, and community-driven learning, aligning with the values and expectations of Gen Z learners. Moonasar and Ngoepe (2023) reiterate that some digital transformations in university libraries in Africa include open-access initiatives and makerspaces, which have which have enhanced technologies such as virtual reality, self-checkout machines and RFID. Other digital transformation in university libraries in Africa include access to reliable Wi-Fi in libraries, on-campus study spaces, research commons, ICT devices (like laptops) loan services, electronic resources, research data services such as research data management, institutional repository and open access initiatives (Ocholla and Ocholla, 2020).-Specifically, Moonasar and Ngoepe (2023) revealed how the Durban University of Technology (DUT) library is responded to disruptive technologies by revitalizing library spaces, setting up makerspaces and equipping the library with cutting-edge technologies like virtual reality, converting the circulation desk into an information desk, utilizing self-checkout kiosks, establishing neutral spaces to promote inclusivity and continual professional development for librarians to upskill and adapt to changes. University libraries have also transformed their spaces and services to include the Learning Commons, as a reflection of understanding the attributes of the Gen Zs.

The hype is real! The expectations and preferences of Gen Z users, characterized by the use of digital tools, short attention spans and a preference for interactive content -find many of the traditional models outdated. This is posing challenges for university libraries in Africa, especially libraries that are still traditionally centred around curated and text-based content. Therefore, libraries and library managers must uncover how they could transform, remodel, or design library services and spaces to enhance collaborative study, research, or learning to meet the information needs of this digital-born generation. Various studies in Library and Information Science (LIS) literature have recommended the urgency for libraries to innovate in response to meeting the unique academic, informational and recreational needs of diverse library users (Lee, Yeo, Zhang, Goh, Ang, and Ng, 2023); and Mohideen, Sheikh, Kaur and Sukmawatid (2022) opines that disruptive technologies should influence librarians' thinking, attitude and approach in rendering smart library services, computer-aided design services, data mining services, and multimedia services to diverse users. Consequently, the time for university libraries in Nigeria to shift their philosophy on library and information service provision from the usual norm of the 'Library Centred' approach to the 'User Centred' approach is NOW!

Gaps in the Literature

The literature reveals that university libraries in developed countries are adapting to the expectations of Generation Z by providing institutional support, user-centered service design, adoption of various innovations etc. While there is growing literature on library innovation and Gen Z behaviours, few studies offer an integrated analysis of how disruptive technologies align with the specific needs of Gen Z across university libraries in Nigeria. Additionally, there is a limited understanding of how university libraries in Nigeria perceive these changes, and how they are deploying strategies to effectively meet the academic, informational and recreational needs of a diverse population, especially, in developing contexts where digital transformation is uneven. This is the gap this study wishes to fill in Library and Information Science (LIS) literature.

Methodology

The study adopted a qualitative approach to providing deeper insights into questions raised in this research. This approach was chosen because it explores human or social issues, thoughts and experiences of participants, and through inductive analysis, themes are generated to understand the phenomenon (Dunwoodie, Macaulay and Newman, 2023; Ndou, Mashau and Chigada, 2023).

Four federal universities namely the University of Lagos, University of Jos, University of Port Harcourt and Federal University of Agriculture, Abeokuta were chosen for the study because they are publicly-funded universities and their years of establishment range from 1962 to 1988. The universities were purposely selected because they have applied ICTs to their library activities and have deployed purpose-fit services to meet the information needs of their diverse student population. The study population comprises 65 Librarians and library officers from the four selected universities. A non-probability sampling technique involving the use of a purposive sampling technique was adopted for selecting a sample size of 25 librarians working in the Reader's Services, Reference and Automation/ICT units as participants for the study. This is because they were considered individuals who could provide rich insights into the phenomenon under investigation. Data was collected through semi-structured interviews via Zoom and mobile telephone from January to February 2024. Each interview session lasted for 30 minutes. The process allowed participants to look holistically at their experience and comment on the overall service delivery process. Data generated from interviewees were analysed thematically. Findings are presented under four themes.

Result

This section provides significant findings of the study under these four themes: **role(s)** played by university libraries in providing fit-for-purpose services to diverse student population in the era of disruptive technologies in Nigeria; **type(s)** of fit-for-purpose services offered by university libraries to diverse student population in the era of disruptive technologies in Nigeria; future of Nigerian university libraries in a disruptive environment and challenges and/or opportunities posed by disruptive technologies to librarians working in university libraries in Nigeria.

Theme 1: Role(s) played by university libraries in providing fit-for-purpose services to a diverse student population in the era of disruptive technologies in Nigeria

When the researchers asked the interviewees about the role(s) university libraries are playing in providing fit-for-purpose services to diverse student populations in the era of disruptive technologies in Nigeria, the majority of the respondents reported that the hype is real as the Gen Z population is independently and remotely using library resources and services that technology is creating. Four respondents remarked that the diverse Gen Z student population on their campuses no longer focuses on traditional library offerings. In addition to hosting events, the respondents mentioned that librarians now serve as managers of institutional repositories, digital librarians by promoting access to electronic resources, evaluate electronic materials, and obtain licenses, IT support specialists, knowledge creators, subject-based specialists, and public relations officers by maintaining relationships with database managers, electronic resources publishers, the community and other institutions or libraries.

Theme 2: Type(s) of fit-for-purpose services provided by university libraries to a diverse student population in the era of disruptive technologies in Nigeria

In response to the question about the type(s) of fit-for-purpose services university libraries in Nigeria are providing to diverse student populations in the era of disruptive technologies, participants reported the provision of virtual library user registration, space transformation for collaborative study and organising social events, deployment of Radio Frequency Identification (RFID) technology for collection management

and QR codes. A librarian from the University of Jos remarked thus: '*We have an institutional repository, this is a form of cloud computing service, and an example of disruptive technology. This is in addition to the use of chatbots and smart assistants on the library website*' (UNIJOS Respondent). The result also shows that the deployment of Artificial Intelligence (Rob scholar) to library service delivery began at the University of Lagos Library in June 2020. Another respondent mentioned that: '*my library usually organises a programme tagged 'Library Hunt' at the beginning of every academic session in collaboration with the Student Union. The programme is specifically tailored to promote awareness of the library holdings and its services and is usually celebrated during the student's Faculty and Hall Week*' (FUNAAB Respondent). One other respondent from the University of Port Harcourt mentioned that: '*In the last two years, the University of Port Harcourt library introduced a game competition for its users as a way of creating visibility for the library and services provided therein*' The need to have a more welcoming library environment for all and to create innovative spaces to foster collaboration and creativity among the diverse student population was a major focus of providing fit-for-purpose library services at the University of Lagos Library. A respondent from the University of Lagos Library highlighted the importance of supporting students' social well-being, in addition to providing access to library facilities and services. This is exemplified by the introduction of a social inclusion program, 'Library Lovers' Day,' initiated in February 2022, which invites students to celebrate Valentine's Day in the library while sharing their thoughts on library services. The program's third edition was successfully held on February 14, 2024.

Theme 3: Future of Nigerian university libraries in a disruptive environment

In response to the question of what is the future of Nigerian university libraries in a disruptive environment, it appears that the respondents were futuristic. Results from the inductive analysis revealed that there are six key areas in the future of Nigerian university libraries. The six key areas are:

1. **Societal transformation:** How will librarians respond to the challenges of an aging and diverse population, and what adaptations will LIS professionals make?"
2. **Technological advancement:** As AI, automation, and innovative communication methods transform library services, how will librarians' roles evolve, and which departments will face the greatest challenges?
3. **Transformation in pattern of work:** With shifting expectations towards more flexible and self-directed work that allow better work-life balance, how will LIS professionals and Library Associations respond to meet this expectation?
4. **Lifelong learning transformation:** Upskilling and reskilling will become even more important as learning processes evolve. How should librarians facilitate this?
5. **Leadership transformation:** What new leadership styles will emerge in librarianship as traditional management approaches become less prevalent?
6. **Business transformation:** How can we ensure that rapid, disruptive business models are capable of developing libraries? What will technology mean for the existing library system?

Theme 4: Challenges and/or opportunities posed by disruptive technologies to librarians working in university libraries in Nigeria

In terms of challenges university libraries are facing in providing fit-for-purpose services to a diverse Gen Z student population, some respondents expressed that the sustainability of these disruptive technologies as libraries begin to adopt them is a major challenge. This is revealed in the words of one of the respondents thus: '*Some of the tools, especially the Chabot are not functional anymore*' (UNIJOS Respondent). Other

challenges reported by participants include inadequate funding, lack of required skills to effectively navigate a disruptive environment, lack of a robust IT network, and irregular electricity.

Discussion of findings

The study examined how university libraries in Nigeria have been involved in providing fit-for-purpose library services in an era of disruptive technologies. Findings showed that the roles of librarians have changed from the provision of a traditional library services approach to a user-centric approach. Some of the changing roles of librarians that were derived from the study include managing institutional repositories, promoting access to electronic resources, IT support, developing relationships with database managers and publishers and public relations roles involving creating connections with communities and organizing and hosting social events. This finding is in consonant with Bogucki (2021) and Kavak and Kop (2025). The institutional repository is a web-based database that collects, stores, manages and provides access to intellectual output (Okon, Eleberi and Uka, 2020). The intellectual outputs of universities archived in institutional repositories include conference papers, data sets, digitally captured course materials, multimedia simulations/visualizations, and captured notes of faculty and lecture series material. Popescu, Popa, and Cotet (2019) noted that resources in the institutional repository are in digital form, in conformity with the expectations and preferences of Gen Z. Furthermore, the study reveals that promoting access to electronic resources, providing IT support, and fostering relationships with database managers are crucial aspects of library services, corroborating the findings of Schmidt (2013) and Ombogo and Namande (2021), who noted that libraries, especially those in higher institutions now provide access to online resources and scholarly databases that are pertinent and contain accurate information.

Findings on the adoption and use of chatbots and smart assistants as revealed in this study is a new wave of leveraging technologies of the fourth industrial revolution tailored towards meeting the information needs of Gen Z. The study also revealed that libraries now organize programmes that support the social wellbeing of today's diverse user population. Such programmes are the Library Lover's Day, Library Hunt and game competition at the University of Lagos Library, Nimbe Adedipe Library, FUNAAB, and the University of Port Harcourt respectively. This is consistent with the findings of previous studies such as Merga (2021). Corroborating the view, Kavak and Kop (2025) suggest that social events enhance users' sense of connection to the library and reposition the library as a multifaceted institution. Willis, Hughes and Bland (2019) and Somaratna (2019) reported that today's library users prefer library spaces that have a relaxing and refreshing look with beautiful and colorful furniture and a place that fosters collaboration and connectedness.

As regards the challenges hindering the provision of fit-for-purpose services to a diverse student population in academic libraries, findings show a lack of sustainability of AI technologies. Other challenges include inadequate funding, lack of required skills to effectively navigate a disruptive environment, lack of a robust IT network, and irregular electricity supply. Previous research has notably emphasized a lack of skills in using disruptive technologies among librarians, an irregular power supply, and inadequate infrastructure for the adoption of technologies of the fifth wave in libraries (Emiri, 2023). This study argues that library stakeholders should embrace and introduce opportunities for formal and requisite training for librarians on the use of technologies of the fourth industrial revolution such as artificial intelligence, data analytics, Internet of Things for library and information service delivery. To ensure the suitability, user-friendliness and trustworthiness of customizable disruptive technologies such as chatbot and robots in providing library and information services for the diverse user population in libraries, librarians must be involved in their design of instruction and implementation by working closely with System analysts and IT experts (Mckie and Narayan, 2019). The illiterates of the 21st century will not be those who cannot read and write but those

who cannot adapt to positive change. LIS professionals, especially those working in university libraries, must promote the needed change in library service delivery. We must avoid a dystopian state where technology is used as a repressive tool and recognize that the future is not born of complacency.

A range of studies have explored the challenges and opportunities that abound with the provision of fit-for-purpose library services to Gen Z students. It then becomes imperative for Library and Information Science (LIS) professionals to understand and adapt to the unique characteristics of this generation and develop the requisite skills necessary for meeting the information needs of Gen Zs (Haseeb, 2019; Marty, 2022; Blockridge and Primeau, 2023). A recent study argues that librarians are to be flexible and innovative in their approach to serving Gen Z students (Badawy, Al Ali, Khan, Dashti and Al Katheeri, 2024). Part of the flexibility required is for libraries to respond positively and innovatively, by infusing technology into library services and improving library spaces to accommodate the learning and information needs of Gen Zs.

Conclusion and Recommendations

The disruptive age is here, and there is no running away from the opportunities it brings and the challenges it poses for the future of the library profession in Nigeria. LIS professionals must recognise that it can no longer thrive on the traditional mode of service delivery as usual. Libraries should be more proactive in providing fit-for-purpose services to the student population, especially the Gen Zs who are the majority on most university campuses. To achieve this, librarians should be ready to make learning, unlearning and relearning top priorities. The study recommends that librarians should: a) develop expertise in emerging technologies used in modern library services, such as AI, data analytics, and digital resource management.; b) be agile and adaptable to changes in new technologies, ensuring that library services remain relevant and effective; c) acquire skills that will remain valuable and applicable in the future, despite technological advancements and changes in the library landscape; and d) show empathy and emotional intelligence: through ability to understand and respond to the needs and emotions of library users to foster a more inclusive and supportive library environment. Moreover, LIS professionals are to do away with outdated library service delivery practices that are no longer effective in meeting the needs of today's library users; reluctance to adopt new technologies and practices; and over-reliance on traditional library services.

Limitation of the study

This study examined how university libraries have deployed fit-for-purpose services to meet the information needs of a diverse student population in Nigeria. The limitation of the study is that data was gathered from a few federal universities and excluded state and private universities. This could affect the generalization of results. Despite the observed limitation, all necessary steps were taken to ensure the validity of the research findings.

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