Article

The Use of Information and Communications Technologies by Library Users at the University of the Western Cape

Yumnaa Ocks
https://orcid.org/0000-0002-2062-5759
University of the Western Cape,
South Africa
3337222@myuwc.ac.za

Oghenere Gabriel
https://orcid.org/0000-0002-0513-023X
University of the Western Cape,
South Africa
osalubi@uwc.ac.za

Abstract

Information and communications technology (ICT) has taken over all spheres of human endeavours. ICT has exerted a profound influence on traditional academic libraries. This study sought to investigate the impact of information and communications technologies (ICTs) on academic library services provision and operations, as well as how ICTs have influenced the use of library information resources by undergraduate and postgraduate students at the University of the Western Cape. The study draws attention to the importance of implementing ICT policies and practices for library operations and practices bounded by the technology acceptance model (TAM). Findings from the study indicate the emergence of ICTs in libraries has drastically changed the dynamics of library operations and services in areas including the online public access catalogue (OPAC), wireless networks, library marketing and online reference services. The findings also revealed that although the use of ICTs in academic libraries enables libraries to offer faster and more efficient services, challenges and obstacles are prevalent, including a lack of training in ICTs and insufficient ICT infrastructure. The findings suggest libraries should formulate and implement an ICT strategy. It is pivotal for libraries to formulate and implement an ICT strategic plan to be used as a guideline for ICT planning of short and long-term developmental programmes. The findings suggest sufficient funding and effective training programmes should also be of the utmost importance to ensure sustainability and relevancy.

Keywords: information and communications technologies; information technology; academic libraries; technology acceptance model; library services

UNISA university of south africa PRESS

Mousaion
https://upjournals.co.za/index.php/LIS
Volume 39 | Number 3 | 2021 | #9358 | 18 pages

https://doi.org/10.25159/0027-2639/9358
ISSN 2663-659X (Online), ISSN 0027-2639 (Print)

Introduction

This study investigated the use of information and communications technologies (ICTs) among students and library staff at the University of the Western Cape (UWC) libraries. This project aimed to investigate the impact of information and communications technologies on academic library services provision and operations, as well as how ICTs have influenced the use of library information resources by undergraduate and postgraduate students at the university.

Academic libraries are seen as an important element in higher education, often known as the "heart" of university institutions (Okonedo et al. 2014, 205). According to Enakrire and Ocholla (2017, 1), the purpose of academic libraries is to support research, teaching and learning within the university.

Information technology (IT) was introduced to libraries, specifically academic libraries, in the 1960s , bringing along with it tools used to speed up and reduce operations and their cost within the library environment (Gurikar and Mukherjee 2015, 273). Information technology is defined as follows by Lunt et al. (2008, 9): "IT, as an academic discipline, is concerned with issues related to advocating for users and meeting their needs within an organizational and societal context through the selection, creation, application, integration, and administration of computing technologies."

Traditional functions in the library and information profession have evovled with much dynamism as a reuslt of ICTs (Hysa and Južnič 2013, 2). Enakrire and Ocholla (2017, 7) defined ICT as a collection of technological tools and resources that can be used to communicate, create, manage, store information and disseminate knowledge globally. Blurton (1999) also reported that ICTs comprise a set of technologies that are applied in the process of storing, collecting, transferring and retrieving information in various formats.

With the growing demand from information users for digital information services, it is evident that technology will continue to evolve and, to keep up with these trends, librarians will have to utilise the changing technology in order to provide effective and efficient access to information resources and services to patrons. In achieving this, academic libraries have to provide innovative information services and resources in an easy, fast and convenient way. Daily operations in libraries such as acquisitions and cataloguing have changed from manual to automated operations (Gurikar and Mukherjee 2015, 273).

As a result of this constant dynamism, librarians are expected to be more proficient and forward-thinking within the digital communication environment (Islam and Islam 2006, 814). Hysa and Južnič (2013, 2) suggest that librarians as information professionals should enhance their technology competencies so as to keep up with the necessary knowledge and skills required in this digital era. They argue that these characteristics

are an integral factor in maintaining effectiveness within the library (Hysa and Južnič 2013, 2).

Lichterman (2011) reports that it is a common assumption to view the advent of ICT as a potential threat that could eliminate the importance of the library, its resources, and its personnel. However, Lichterman (2011) avers that the internet has drastically changed the way users interact with information and has redefined the library's place in academia and society. Lichterman (2011) also states that technology can not work in isolation; it requires a professional to manage it.

This study highlighted both the advantages and the challenges associated with the introduction of ICTs into academic libraries. It also identifies the factors that influence students' attitudes towards ICTs and will thus try to develop or amend the factors affecting students' attitudes to direct them towards positively using ICTs. The study could therefore be used for future reference in improving ICTs in academic libraries.

The study further asserts that the move from a conventional library environment to a new digital one has forced LIS education systems to change its programmes and curricula to provide sufficient content and practice that will equip librarians with the necessary competencies to meet the needs of twenty-first century patrons (Hysa and Južnič 2013, 2). The study may also inspire interest in more research in the area of ICT application in routine library activities in academic libraries. All the above are in addition to contributing to the existing literature on the subject matter.

Statement of the Problem

According to Fox and Bayat (2007, 14), the concept of a research problem can be defined as filtering down the common interest in a research topic into a specific research problem that is small enough to be explored. It is clear that the innovation of technology has created a major shift in all disciplines including library services and librarianship (Freeman 2005). The role of library and information science (LIS) in a changing era requires redefining service skills to remain important (Freeman 2005).

A great transformation of library and information activities has taken place due to the growth and emergence of the knowledge society in the form of library resource sharing networks, digital libraries, content development and content management (Rath 2019, 2). It is therefore becoming increasingly vital for librarians to innovate and highlight their relevance in a drastically transformative, technologically dynamic work environment (Rowley 2015, 438).

These challenges to the conventional role of the academic library require professionals to repurpose and reconsider libraries' purposes and services (Rowley 2015, 438). A major challenge lies in maintaining relevancy through communication, which requires the library to broaden its service provision outlook from only user satisfaction towards meeting unarticulated needs, ensuring that the services supplied and its role within the

university community remain constantly in demand (Rowley 2015, 438). Hence the need to investigate the impact of information and communications technologies on academic library services provision and operations.

The main objectives of this study are to:

1. Assess the impact of ICTs on academic library operations and academic librarians' functions;

2. Assess how ICTs have influenced undergraduate and postgraduate students' use of library information resources;

3. Identify the challenges of ICT-based library operations and services;

4. Identify how conventional library and information services can be delivered more efficiently through using ICTs.

The research questions guiding this study include the following:

1. To what extent have ICTs impacted academic library operations as well as academic librarians' functions?

2. How have ICTs influenced undergraduate and postgraduate students' use of library information resources?

3. What challenges do librarians and students experience in the utilisation of ICT-based library operations and services?

4. In what ways can ICTs be used to deliver more efficient library and information services?

Literature Review

Academic libraries are used as pillars in supporting and achieving the vision and the mission of universities. In achieving this, academic libraries have to provide innovative information services and resources in an easy, fast and convenient way. Implementing and integrating ICTs within library functions and services have made this possible (Okonedo et al. 2014, 206). According to Peyala (2011, 23), the use of innovative information technology has contributed immensely to making life easier. IT, combined with computer and telecommunications techniques, has made it possible to create innovative systems and products used in the workplace, the home and the education realms. With the use of ICTs and communication devices such as mobile phones, computers and platforms that enable video conferencing and emails, obstacles such as time and space no longer exist. Advancements in ICTs, such as the printing press

introduced by Johannes Gutenberg and other innovative technologies, drastically altered libraries, librarians and librarianship in general (Momoh 2018).

Krubu and Osawaru (2010, 7) reported that additional ICT advancement tools used in the library could refer to online services and electronic databases. New ways of scholarly communication, the immense growth of mobile devices, the expansion of virtual spaces for libraries and the proliferation of social media have collectively affected the traditional role of academic libraries (Raju 2014, 164).

ICTs have transformed library institutions from just being physical structures housing information resources to institutions providing online collections that are accessible off-campus, within classrooms, within offices and globally. It is evident that the use of ICTs has had a positive impact on the quality of information delivery. Users are now able to access information at the click of a button within their homes, classrooms, and offices, without having to physically visit the library (Olaniyi et al. 2012, 517). According to Ukachi, Onuoha and Nwachukwu (2014), the introduction of numerous and diverse ICT trends has led to a restructuring of the library, a shift in work patterns, a need for new skills, and a reclassification of positions and job retention in libraries. This has also brought about a shift in the way libraries share, retrieve and access information.

Innovations and advancements within the digital era have brought about contemporary tools used for sharing, searching, and preserving information. These services enable libraries to create awareness about library products and services. Current awareness services (CASs) keep users up to date with the latest professional literature in their fields of interest and inform library users about new acquisitions in their libraries (Jibia, Mubaraka, and Michael 2013, 3).

Library automation has made cataloguing possible by allowing librarians to import bibliographic records from trusted online sites, for example OCLC WorldCat (Tabusum, Saleem, and Batcha 2013, 23). The advantages of automation include, but are not limited to, efficiency, automatic updates, speed, improved work consistency and the reduction of routine and repetitive work.

Libraries and librarians are becoming aware of these trends and are establishing a social media presence. This allows them to promote library services and reach their user populations. Librarians can reach their users through a variety of communication methods by using innovative and enhanced social networking sites (Amarakoon and Amarakoon 2012). Social media platforms could be used by library users for free and offer open access digital content. For example, videos uploaded to YouTube and information services tools outside traditional settings could be used for instructional purposes (Duncan, Yarwood-Ross, and Haigh 2013, 1577). Pearce and Tan (2012, 126) concurred, stating that this could potentially lead to the development of research.

Afolabi and Abidoye (2011, 115) reported that effective and efficient library and information services would entail the use of ICT tools and services such as computers, the internet, email, video conferencing and computer networking to carry out library operations.

To be effective in information services delivery, librarians need to be alert, creative and informed about what is happening in their environment. It is evident that it is vital to equip librarians with skills on the ability to analyse, access, apply and evaluate information rapidly (Koganuramath, Choukimath, and Agadi 2014, 152). It is reported that ICTs used in libraries create challenges for professional librarians in developing countries. Training in developing skills and competencies in the usage of ICTs is required, making it essential for ICT skills and curricula to be integrated for information professionals.

This study is anchored on the theory of the technology acceptance model (TAM) proposed by Davis (1989). This model puts forward the idea that when users are presented with new technology, a number of factors influence their perceptions and their decisions about how and when they can make use of it (Davis 1989, 321). Numerous empirical studies have found that TAM consistently explains a substantial proportion of the variance in users' intentions and behaviours to utilise a variety of information technologies. The TAM is therefore relevant within this study as it aims to predict and could be used to explain the acceptance or the rejection of modern technology by students and library staff at the University of the Western Cape.

Davis (1989, 320) suggested that the attitude of the user is influenced by two major beliefs: perceived usefulness (PU) and perceived ease of use (PEOU) (Davis 1989, 320).

PU is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis 1989, 320). Hence, using mobile devices and other electronic devices to search for information electronically can enhance a student's academic activities more than only using traditional ways. According to Kurniabudi and Assegaff (2014), the technology acceptance model is a great way to explain attitudes towards using ICTs.

This model has extensively been used for predicting the adoption, acceptance and use of information technologies. Almasri (2014, 7) argued that the TAM is an acceptable model and has been implemented largely to assess the adoption of ICT systems such as internet banking, e-learning, online auctions, the World Wide Web, Radio Frequency Identification (RFID), e-portfolio systems, wireless LAN, e-commerce and e-government.

TAM is a model that can be used to inform creators about the influence and impact of the system on the user's behaviour. Based on the strengths highlighted above, this model would therefore be relevant in investigating and exploring the objectives of this study.

This model also provides a framework for exploring the effects of external variables on system usage. The model suggests that using information systems is highly influenced by users' intentions to use the system, which in turn are determined by the users' beliefs about the system. This model was used to investigate the impact of ICTs on academic library operations and services by looking at perceived usefulness (PU) and perceived ease of use (PEOU) among staff and students in relation to using ICT tools.

Research Methodology

A descriptive survey research design was employed for this research study. This study employed quantitative research methods for the collection and analysis of data. Data was captured in a Microsoft Excel spreadsheet and exported to the Statistical Package for the Social Sciences (SPSS) for analysis. The collected data was analysed using descriptive statistical methods, including simple percentages, as a measure of dispersion and central tendencies. The study comprised two population groups: University of the Western Cape's library staff members and registered students (both undergraduate and postgraduate active library users). According to data obtained from the UWC Library Circulation Services Unit in June 2019, there are 8000 weekly active student users at the library and a total library staff population of 46.

A simple random sampling technique was employed to determine the sample size for library staff members, while a simple random technique was used to determine the sample size for students. This technique helped to reduce any form of bias involved as compared to any other sampling method. Two survey questionnaires were used to collect data for the study: one for staff and the other for students at the UWC library.

The data obtained from the UWC library indicated a population of 8000 active weekly student users. With an error margin of 9%, a 95% confidence level, a response distribution of 50% and a population of 8000 active weekly student users, calculation from the Raosoft sample size calculator returned a minimum representative sample size of 117. The minimum representative sample acceptable for the study was 117 library users, but a total number of 155 library users completed the survey. Out of this number, 17 responses were not usable or incompletely filled-in by participants, giving 138 usable responses from library users. There were 19 staff members that participated in the study, which was above the minimum estimated sample population. The survey contained closed-ended questions, and the responses were analysed using accepted quantitative techniques.

Results and Discussion

The summary of the findings will be in light of the questions raised for the research study.

Students were asked to indicate how often they make use of library and other online information resources in the library. The findings revealed that the majority of

respondents make use of the library and other online information resources two to three times a week (33.3%). Forty-four (31.9 %) of the students indicated that they make use of the library and other online information resources daily. Twelve (8.7%) indicated that they make use of the library and other online information resources fortnightly; 16 (11.6%) indicated that they make use of the library and other online information resources monthly, and 20 (14.5%) of the students reported making use of the library and other online information resources weekly.

Table 1: Use of the library and other online information resources

Frequency of use	***n* (%)**
Two to three times a week	46 (33.3)
Daily	44 (31.9)
Fortnightly	12 (8.7)
Monthly	16 (11.6)
Weekly	20 (14.5)
Total	**138 (100%)**

The students (undergraduate and postgraduate) were also asked to indicate how ICTs have influenced their use of library information resources. It was revealed that the majority of the students, 113 (82%), use computers, and that 83 respondents (60%) indicated they use mobile devices when accessing library information services or library resources. This concurs with a study conducted by Aheto and Cronje (2018, 101), which reported that more students use their laptops for academic work only, followed by smartphones for academic and other purposes. Another study also observed that the students' visits to the library were often in order to use electronic resources such as computers, as students often had to wait in line to use computers at peak times during semesters (Salubi, Ondari-Okemwa, and Nekhwevha 2018, 6). The results further revealed that although computers and their internet-based facilities were preferred by most users, there were still users who made use of the OPAC and printing facilities provided in the UWC library.

The findings also showed that 80 respondents (58%) indicated that they make use of electronic databases; 56 respondents (41 %) indicated that they make use of printers and scanners when using library information services or library resources; 40 respondents

(29%) indicated that they use the online public access catalogue and only eight respondents (6%) indicated that they use virtual reality (VR).

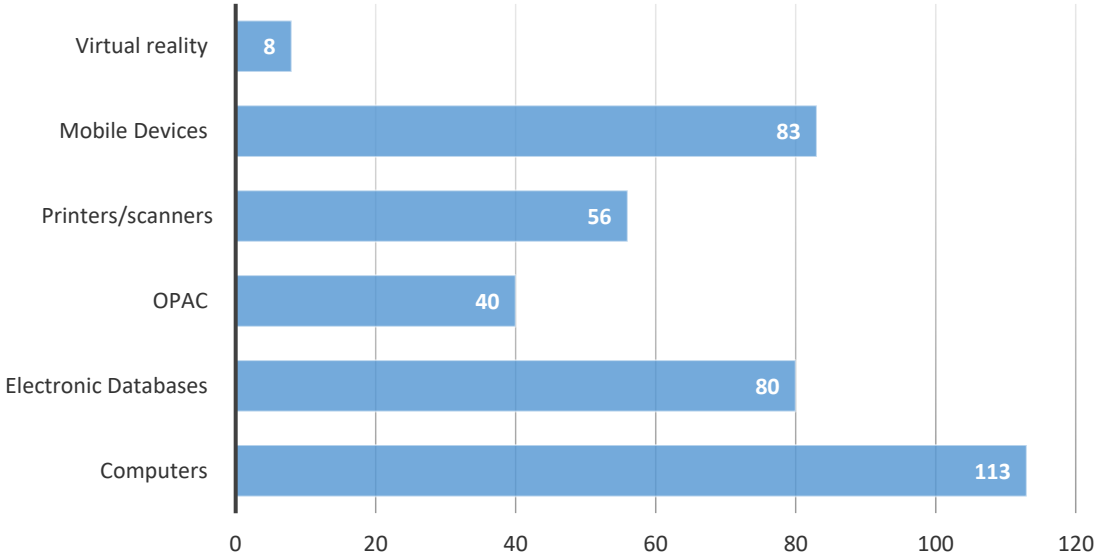

Figure 1: ICT tools used when accessing library information services/library resources

It is evident, based on the results from this study, that the emergence of ICTs within academic libraries has had a significant impact on library operations and services. It is clear that innovative developments in the technological sphere have contributed to radical changes in library operations and services. It is also clear that the use of ICTs within academic libraries has created many opportunities for interoperability and information exchange. It is therefore clear that ICTs have been embraced by the students at the University of the Western Cape library by utilising ICT tools and functions to complete assignments, proving that they are useful in light of the technology acceptance model (TAM).

Library staff members were also asked to indicate to what extent ICTs have impacted library operations and functions over the last decade. The data received for this question revealed that the majority of respondents indicated that library services and operations have changed "to a great extent" due to ICTs in the last decade. Previous research also reported that daily operations in the library such as acquisitions and cataloguing have changed from manual to automated operation (Gurikar and Mukherjee 2015, 274).

Olise's study (2010, 160) revealed that the majority of the respondents saw ICTs as a significant tool for sustainable development in Africa. Research further corroborated that in the last eight to 10 years, Web 2.0 has revolutionised information communication by providing faster information sharing, networking, and enabling multimedia services to operate (Singh and Naidu 2015, 16). The emergence of social networks and

interactions has driven libraries to adopt technological tools in their daily routines to meet users' expectations and information needs. The data shows that a high percentage of respondents replied that circulation services have only changed "somewhat" in the last decade. It also revealed that a high percentage of respondents indicated that inter-library loans have also changed "somewhat" due to ICTs in the last decade.

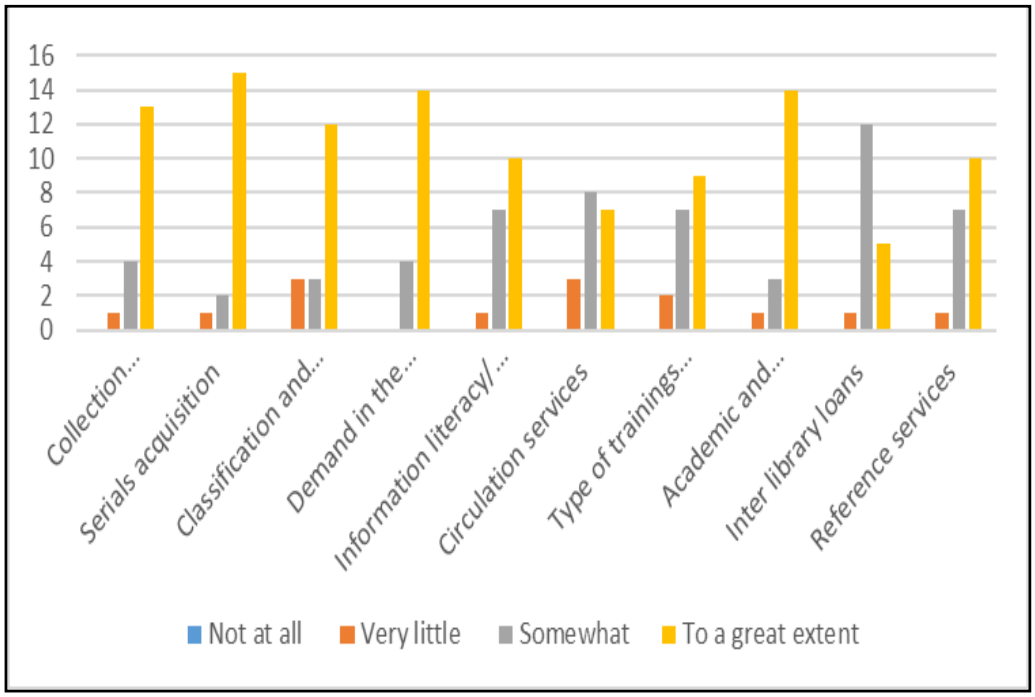

Figure 2: Changes due to ICTs in library services and operations in the last decade

The students were also asked to identify the information resources or services they made use of when they visited the library (online or physically). The options listed were computers in the computer labs, the UWC Online Repository, faculty librarians, academic open access repositories, specialised software, reference services, research support services, scholarly databases, internet connection and document processing software.

The results reveal the majority of the respondents indicated that they make use of the internet in the library. The finding concerning the high rate of internet usage corresponds with conclusions reached by scholars such as Sahoo and Sharma (2015, 712), who showed that many libraries were electronically networked and relied heavily on computer and telecommunication technologies as a means of providing library and information services. The shift in library user behaviour and interests has prompted academic libraries to add a networked environment as an extension of traditional library services.

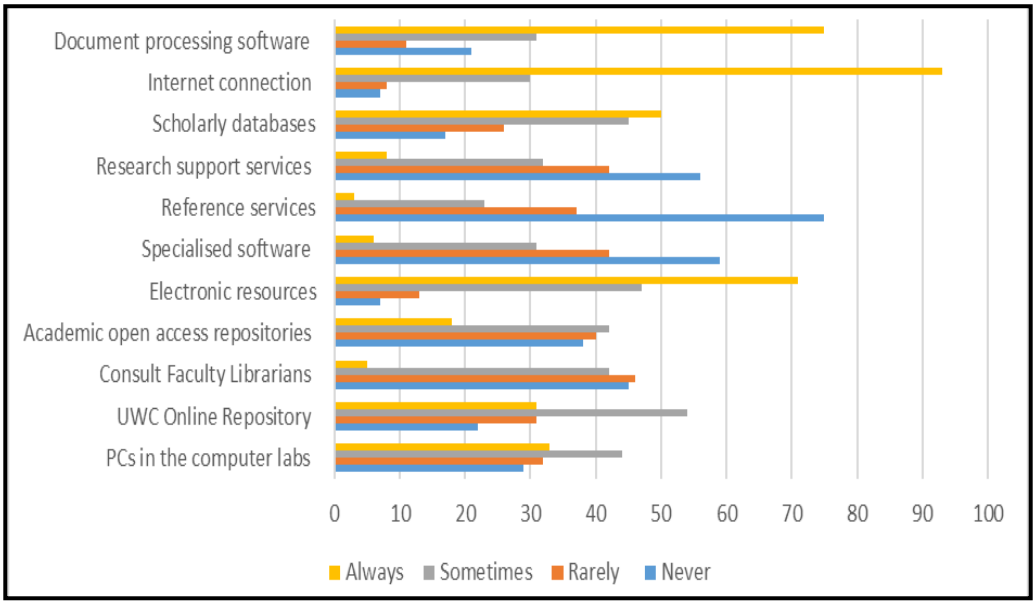

Figure 3: Information resources and services utilised during library visits (online and physically)

The technology adoption model (TAM) proposed by Davis (1989) was tested on UWC library staff to measure their attitude towards the usefulness and perceived ease of use of ICTs in the practices and operations of the library. The study reveals that the majority of respondents indicated that the use of ICTs in libraries has made daily operations easier.

The majority of the respondents also indicated that the use of ICTs has provided more efficient services. Kumar (2012, 2) states that a study conducted to test the application of ICTs in the state libraries of Haryana and Chandigarh in India concluded that library automation is one of the most effective applications of ICTs.

The majority of the respondents selected the option that they “strongly agree” the use of ICTs in libraries has improved practices and operations by saving more time in the library. A high response rate for error free processes in operations revealed that the majority of the respondents “agree” that the use of ICTs in libraries has improved libraries.

Swaminathan (2017, 5345) reports that OPAC enables users to search, access, renew, reserve and see the issue status of the library collection. This database also allows users to simultaneously search its contents.

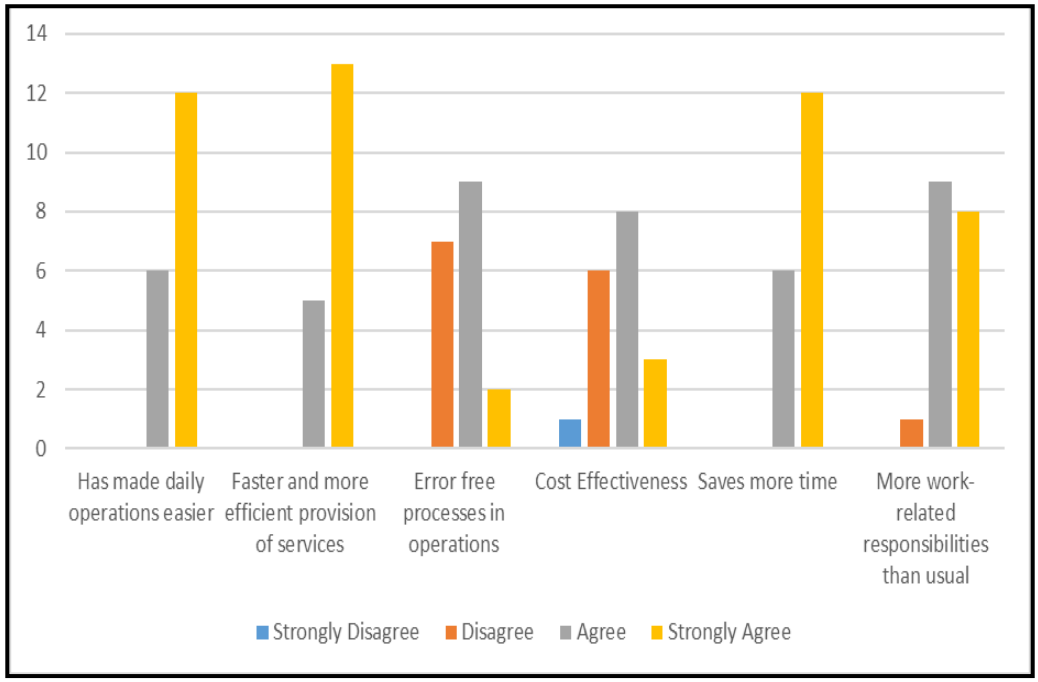

Figure 4: The challenges of ICT-based library operations and services

However, there are several challenges that do arise when using ICT tools in libraries. Libraries globally are experiencing issues such as limited funding, constant changes in software and hardware, and a lack of ICT skills and knowledge. Copyright and intellectual property rights are also a common problem that libraries are facing globally.

The data gathered from the study revealed the majority of librarians indicated that they have more work-related responsibilities than before. Staff members also indicated that a lack of knowledge and ICTs skills is a challenge experienced in their library. Library training was highlighted as a priority in delivering more efficient and effective library services. This is because without ICT skills, library professionals will face difficulty in implementing new technologies in the libraries. In support of this, Khan and Qutab (2016, 300) and Dhanavandan and Tamizhechelvan (2014, 67) state that for libraries to effectively meet users' needs, there is a need for improvement in ICT skills among library professionals. Therefore, they must continue to be educated for the smooth running of the services in the libraries. The data gathered from the UWC library staff members also indicated that there is a need for improved printing and scanning facilities, increasing of staff complements, improved computers, and improved internet speed and digitisation tools. Staff members from the UWC's library also highlighted the power shortages experienced at the library, which create challenges in providing library services. Moreover, they indicated that they occasionally experienced inadequate ICT infrastructural facilities and inadequacy in the planning and implementation of ICT-based services in the library.

The findings also revealed that requests for more computers and printers in the library are in progress. The data gathered revealed the students indicated that they usually experienced a lack of appropriate ICT facilities at the library. It is important for libraries to obtain sufficient ICT facilities to ensure that students requiring these facilities will have a chance to make use of them. A lack of sufficient facilities may discourage students from using the library and may increase negative connotations towards the library. The respondents also indicated that they experienced difficulties when it came to constant changes in the software and hardware used in the library, limited internet, insufficient knowledge in the use of ICT tools, an inconsistent power supply, inadequate support from the library, limitations of online full-text resources and poor internet connections.

Conclusion

This study has shown that academic libraries are central to any academic institution. The library's contribution to the success of the institution lies in its alignment with institutional goals and its relevancy and innovation in meeting students' needs. Technological trends and developments are inevitable. It is therefore important that libraries keep abreast of these developments to remain relevant. It is clear that ICTs have played a major role in technological and innovative services offered at academic libraries. The growing demand for ICTs and infrastructural facilities in libraries can be seen in the daily ICT usage in libraries. It is also evident that ICTs have proved to be useful among both students and staff at academic libraries. The findings in the study have proved that ICTs used in academic libraries are perceived as easy to use and useful.

The findings also showed that difficulties and challenges in the use of ICTs within libraries are prevalent. It is therefore important to look at various factors associated with the use of ICTs to ensure their effectiveness and efficiency. It is important to look at the challenges and the constraints of using ICTs in academic libraries. This would then allow for possible solutions and future developments in resolving the challenges. The evolution of ICTs shows that future trends, updates and innovations are inevitable. It is therefore necessary for libraries to stay abreast of innovations and implement plans and policies that are relevant to ICTs, ensuring continued sustainability and quality control.

Study Recommendations

The results show that ICTs have significantly impacted the library arena by providing convenience, simplified acquisition, better organisation, and expansive storage, retrieval and usage of information in libraries.

The following recommendations were discussed with reference to specific research questions posed within the study. It is important that continual upgrading and alignment of ICTs within academic libraries should be done with the aim to enhance specific information services. The maintenance of ICT facilities should be conducted frequently to maintain the sustainability of ICT services. Challenges are bound to occur in any

organisation, especially in the introduction of new systems and tools within the library. It is important that the introduction of ICTs within academic libraries should be encouraged and sustained. Libraries should therefore formulate and implement an ICT strategy, which, in addition to being used to guide the improvement of ICT infrastructure, should lay out short- and long-term skills development programmes.

Academic libraries should develop long- and short-term in-house training programmes for its staff members, to enable them to effectively use and apply ICTs in library services provision. This must be done regularly because information technologies change rapidly. It has become pivotal for library professionals to enhance their ICT skills to allow them to provide ICT-based library services to patrons.

It is also important and recommended to have qualified technical personnel to maintain and manage the ICT facilities to ensure their smooth operation. A backup generator should be acquired to eradicate challenges stemming from frequent power cuts. It is imperative for libraries to embrace new technological trends and developments, thus ensuring their relevance to users. It is also important for academic librarians to adopt technologies that meet the needs of their users. It is evident that due to the quick pace and transient nature of technological development, ICTs in academic libraries require sustained funding. Therefore, sufficient funds should be allocated for ICTs in academic libraries. Libraries should also be provided with sufficient funds to attain modern information communication facilities.

References

Afolabi, A. F., and J. A. Abidoye. 2011. “Integration of Information and Communication Technology in Library Operations towards Effective Library Services.” *Journal of Educational and Social Research* 1 (4): 113–20.

Aheto, S. K., and J. Cronje. 2018. “Digital Device Ownership and Learning Environment Preferences of Students in South Africa and Ghana.” *Turkish Online Journal of Distance Education* 19 (3): 93–111. https://doi.org/10.17718/tojde.445093.

Almasri, A. 2014. “The Influence on Mobile Learning Based on Technology Acceptance Model (TAM), Mobile Readiness (MR) and Perceived Interaction (PI) for Higher Education Students.” *International Journal of Technical Research and Applications* 2 (1): 5–11.

Amarakoon, L. R., and R. S. K. Amarakoon. 2012. “Web 2.0, Social Media and Libraries: Role of Social Media in Promoting Library and Information Services in an Academic Setting: With Special Reference to University of Bolton (UoB) Academic Centre Sri Lanka Library.” Paper presented at the National Institute of Library and Information Sciences Conference, Sri Lanka, November 22–23, 2012. Accessed December 14, 2021. https://scholar.google.com/scholar?cluster=6921194073347916455&hl=en&as_sdt=0,5.

Blurton, C. 1999. “New Directions of ICT-Use in Education.” In *UNESCO’s World Communication and Information Report*. New York, NY: UNESCO. Accessed December 14, 2021. https://www.academia.edu/36107452/New_Directions_of_ICT-Use_in_Education.

Davis, F. D. 1989. “Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology.” *MIS Quarterly* 13 (3): 319–40. https://doi.org/10.2307/249008.

Dhanavandan, S., and M. Tamizhechelvan. 2014. “Role of Information Technology in Academic Libraries: Personal Computers to Cloud Computing.” *International Journal of Advanced Library and Information Science* 2 (1): 62–71.

Duncan, I., L. Yarwood-Ross, and C. Haigh. 2013. “YouTube as a Source of Clinical Skills Education.” *Nurse Education Today* 33 (12): 1576–580. https://doi.org/10.1016/j.nedt.2012.12.013.

Enakrire, R. T., and D. N. Ocholla. 2017. “Information and Communication Technologies for Knowledge Management in Academic Libraries in Nigeria and South Africa.” *South African Journal of Information Management* 4 (2): a750. https://doi.org/10.4102/sajim.v19i1.750.

Fox, W., and M. S. Bayat. 2007. *A Guide to Managing Research*. Cape Town: Juta.

Freeman, G. 2005. “The Library as Place: Changes in Learning Patterns, Collections, Technology and Use.” In *Library as Place: Rethinking Roles, Rethinking Space*. Alexandria, VA: Council on Library and Information Resources. Accessed December 14, 2021. https://www.clir.org/pubs/reports/pub129/freeman/.

Gurikar, R., and B. Mukherjee. 2015. “Information Technology Usage Scenario in Academic Libraries of Higher Education in Chhattisgarh: Challenges and Opportunities.” *DESIDOC: Journal of Library and Information Technology* 35 (4): 273–80. https://doi.org/10.14429/djlit.35.4.8844.

Hysa, B., and P. Južnič. 2013. “Agents of Change: Regional Cooperation and LIS Education and Training.” Paper presented at the IFLA World Library and Information Congress, Singapore, 2013. Accessed December 10, 2021. http://library.ifla.org/id/eprint/237/1/197-hysa-en.pdf.

Islam, S., and N. Islam. 2006. “Information and Communication Technology (ICT) in Libraries: A New Dimension in Librarianship.” *Asian Journal of Information Technology* 5 (8): 809–17. Accessed December 10, 2021. http://docsdrive.com/pdfs/medwelljournals/ajit/2006/809-817.pdf.

Jibia, M. S., C. M. Mubaraka, and O. Michael. 2013. “Integrating ICT in Library Management: Design and Development of an Automated Library Management System for Cavendish University Uganda.” *Innovative Systems Design and Engineering* 4 (5): 1–11. Accessed December 10, 2021. https://www.iiste.org/Journals/index.php/ISDE/article/viewFile/5530/5644.

Khan, A., and S. Qutab. 2016. “Understanding Research Students’ Behavioural Intention in the Adoption of Digital Libraries: A Pakistani Perspective.” *Library Review* 65 (4/5): 295–319. https://doi.org/10.1108/LR-06-2015-0070.

Koganuramath, M., P. A. Choukimath, and K. B. Agadi. 2014. “Scholars’ Lab: A Promising Academic Space for Accelerating Social Science Research.” In *Proceedings of the 9th Convention of the Information and Library Network (INFLIBNET) Centre, Dibrugarh University, Assam, September 25–27, Gandhinagar*, 151–55. Gandhinagar: INFLIBNET. Accessed December 10, 2021. https://ir.inflibnet.ac.in:8443/ir/bitstream/1944/1804/1/17.pdf.

Krubu, D. E., and K. E. Osawaru. 2010. “The Impact of Information and Communication Technology (ICT) in Nigerian University Libraries.” *Library Philosophy and Practice* 515. https://digitalcommons.unl.edu/libphilprac/515.

Kumar, P. 2012. “Application of ICT in Public Libraries: A Comparative Study of State Central Library, Haryana, and TS Central State Library, Chandigarh.” *Journal of Knowledge and Communication Management* 2 (1): 89–98. https://doi.org/10.5958/j.2277-7938.2.1.006.

Kurniabudi, S., and S. Assegaff. 2014. “A Literature Review: Acceptance Models for e-Learning Implementation in Higher Institution.” In *Proceedings of the 2014 International Conference on Advances in Education Technology (ICAET-14)*, edited by K. L. Halim, 86–89. Bandung: Atlantis Press. https://doi.org/10.2991/icaet-14.2014.20.

Lichterman, J. 2011. “The 21st Century Library: Books May Gather Dust in the Stacks, But Librarians Are Busier Than Ever.” *The Michigan Daily*, October 16, 2011. Accessed December 9, 2021. https://www.michigandaily.com/news/changing-librarian.

Lunt, B. M., J. J. Ekstrom, S. Gorka, G. Hislop, R. Kamali, E. Lawson, R. LeBlanc, J. Miller, and H. Reichgelt. 2008. *Information Technology 2008: Curriculum Guidelines for Undergraduate Degree Programs in Information Technology*. Association for Computing Machinery (ACM) and IEEE Computer Society. Accessed December 9, 2021. https://www.acm.org/binaries/content/assets/education/curricula-recommendations/it2008-curriculum.pdf.

Momoh, E. O. 2018. “Information Technology and the Future of Librarianship.” *Library Philosophy and Practice* 2079. https://digitalcommons.unl.edu/libphilprac/2079/.

Okonedo, S., O. I. Amusa, O. D. Bakare, O. B. Bamigboye, and M. K. Alawiye. 2014. “ICT Influence on Globalization of Library and Information Services Delivery in Academic Libraries in South West, Nigeria.” *Information and Knowledge Management* 4 (12): 205–12.

Olaniyi, O. M., A. Omotosho, E. A. Oluwatosin, O. K. Towolawi, and G. C. Grant-Ezeronye. 2012. “Application of Information Communication Technology to the Management of Library’s Readers’ Desk.” *DESIDOC: Journal of Library and Information Technology* 32 (6): 516–25. https://doi.org/10.14429/djlit.32.6.2849.

Olise, F. P. 2010. “Information and Communication Technologies (ICTs) and Sustainable Development in Africa: Mainstreaming the Millennium Development Goals (MDGs) into Nigeria’s Development Agenda.” *Journal of Social Sciences* 24 (3): 155–67. https://doi.org/10.1080/09718923.2010.11892851.

Pearce, N., and E. Tan. 2012. “Online Videos in the Classroom: Exploring the Opportunities and Barriers to the Use of YouTube in Teaching Introductory Sociology.” In *Using Social Media Effectively in the Classroom*, edited by K. Kyeong-Ju Seo, 146–60. New York, NY: Routledge.

Peyala, V. 2011. “Impact of Using Information Technology in Central University Libraries in India: Results of a Survey.” *Program: Electronic Library and Information Systems* 45 (3): 308–22. https://doi.org/10.1108/00330331111151610.

Raju, J. 2014. “Knowledge and Skills for the Digital Era Academic Library.” *The Journal of Academic Librarianship* 40 (2): 163–70. https://doi.org/10.1016/j.acalib.2014.02.007.

Rath, P. 2019. “Transforming Library Information Science Education in 21st Century.” Paper presented at the First International Conference on Transforming Library 2017 at the Central Institute of Technology, Kokrajhar. Accessed December 10, 2021. https://www.researchgate.net/publication/331979974_Transforming_Library_Information_Science_Education_in_21st_Century.

Rowley, J. 2015. “Knowledge Management—The New Librarianship? From Custodians of History to Gatekeepers to the Future.” *Library Management* 24 (8/9): 433–40. https://doi.org/10.1108/01435120310501112.

Sahoo, D. R., and D. Sharma. 2015. “Social Networking Tools for Library Services.” *International Journal of Innovative Science, Engineering and Technology* 2 (3): 702–14. Accessed December 10, 2021. http://ijiset.com/vol2/v2s3/IJISET_V2_I3_114.pdf.

Salubi, O. G., E. Ondari-Okemwa, and F. Nekhwevha. 2018. “Utilisation of Library Information Resources among Generation Z Students: Facts and Fiction.” *Publications* 6 (2): 16. https://doi.org/10.3390/publications6020016.

Singh, U., and G. H. S. Naidu. 2015. “Web 2.0 Applications in Library.” *School of Library and Information Science* 15: 1–17.

Swaminathan, K. S. M. 2017. “Use and Awareness of Online Public Access Catalogue (OPAC) by Students and Faculty Members of Anna University Regional Campus, Coimbatore, Tamil Nadu: A Case Study.” *International Journal of Scientific Research and Management* 5 (5): 5345–349. https://doi.org/10.18535/ijsrm/v5i5.11.

Tabusum S. Z. S., A. Saleem, and M. S. Batcha. 2013. “Impact of Library Automation in the Development Era.” *IOSR Journal of Humanities and Social Science (IOSR-JHSS)* 17 (5): 20–26. https://www.iosrjournals.org/iosr-jhss/papers/Vol17-issue5/D01752026.pdf.

Ukachi, N. B., U. D. Onuoha, and V. N. Nwachukwu. 2014. “Students’ Attitudes as a Determining Factor to Electronic Information Resources Use in University Libraries in South-West, Nigeria.” *DESIDOC: Journal of Library and Information Technology* 34 (4): 333–41. https://publications.drdo.gov.in/ojs/index.php/djlit/article/view/6269.