eReadiness of the Namibia University of Science and Technology Library to deliver library and information services through mobile phone technology

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This research aimed to assess the e-readiness of the Namibia University of Science and Technology Library to deliver library and information services through mobile phone technology. The study used the mixed methods approach whereby qualitative and quantitative data were collected. Closed-ended questionnaires were used to collect data from postgraduate students whilst interview guides were used for conducting interviews with librarians and the ICT Manager. Total enumeration sampling was used to solicit a sample for postgraduate students. Conversely, librarians and the NUST ICT Manager were purposively sampled. Quantitative data were analysed using Microsoft Excel to produce descriptive statistics. In contrast, qualitative data were analyzed thematically. The study concluded that NUST Library is ready to deliver library services through the use of mobile phone technology because it has the required ICT infrastructure whilst user attitudes to the implementation of these services were also found to be favourable. Despite this, the study identified some challenges that could negatively affect service provision if not rectified. Consequently, the study recommended that action be taken to rectify these challenges.

Keywords: Mobile phones, Library and information services, Academic Libraries, attitudes, challenges, Namibia.

1 Introduction

Mobile technology is critical in the delivery of library services and resources. According to Saxen and Yadav (2013: 2), academic libraries are leveraging technologies associated with the implementation of library services via mobile phones to support distance learning. According to Singh and Nikandia (2017: 158), mobile phones are now used in information, research, teaching, learning, health, agriculture, and other fields. Mobile technology is a modern innovation that libraries are utilizing to provide services and resources to users via internet-enabled devices such as smartphones, e-book readers, and laptop computers (Singh & Nikandia, 2017: 158).

According to Mbambo-Thata (2010: 469), South Africa is one of the African countries that has implemented mobile technology in academic libraries, with the universities of Johannesburg and South Africa being the most visible. The University of South Africa uses short message services to notify students about registration, examinations, assignments, and other valuable information. Some libraries offer Online Public Access Catalogs through mobile-friendly websites. Libraries can use mobile technology to send text messages about library reservations, overdue materials, and charges for overdue library materials. Libraries can now allow readers to access e-books and e-journal articles from their mobile devices (Mills, 2009: 3).

Certain conditions must be met before mobile technology can be implemented. It could be argued that the use of mobile technology in a library creates a completely different environment for interaction between the user and library services than the more traditional library environment. According to Neupane (2012: 17), despite the challenges faced, the ability for users to interact with library services via mobile devices is advancing, providing new opportunities for information search and retrieval. Because of practical considerations such as connectivity, as well as hardware and mobile interface design, the desired level of interactivity and connectedness through mobile technology has not yet been achieved. According to Saxen and Yadav (2013: 2), mobile technology is unlikely to be able to provide the necessary services on its own but must be integrated with digital technology.

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When it comes to the use of mobile phone technology to offer library services, NUST Library appears to be lagging. The Library has in recent years experimented with the use of mobile phone technology in the delivery of library services by offering a limited range of user services to postgraduate students and academic staff. Although early adopters of mobile library services have built them around the SMS service (Anbu & Mavuso 2012, Mbambo-Thata 2010), libraries that have adopted robust services have built them around mobile Internet (Bomhold 2014). The ICT infrastructure is, therefore, critical for the adoption and use of library services through mobile phone technology. Besides, other factors that include funding, staffing, and policy regime are equally important. This study was, therefore, undertaken to determine the readiness status of the NUST Library to adopt and implement mobile phone technology in the delivery of library and information services by examining the existence and status of the factors specified above.

2 Objectives of the study

The primary goal of the study was to determine NUST Library's readiness to adopt and implement mobile phone technology in the delivery of library and information services. The following were the study's specific objectives:

- Identify factors that may influence the implementation of library and information services through mobile phone technology.
- Determine library users' attitudes towards accessing library and information services through mobile phones.
- Investigate the challenges likely to be faced in using mobile phone technology in offering and accessing library services.

3 Literature review

This study aimed to examine the e-readiness status of the Namibia University of Science and Technology Library to deliver library and information services through mobile phone technology. The literature that is reviewed in this section is based on three thematic areas coined from the study's objectives namely factors that may influence the implementation of library and information services through mobile technology; library users' attitudes towards accessing library and information services through mobile phones; and challenges likely to be faced in using mobile phone technology in offering and accessing library services.

The ability of an organization to access and effectively apply new technologies for providing goods and services is referred to as readiness (Lou, 2010: 947). According to Baker (2012: 231), several factors contribute to an organization's e-readiness capability to adopt new technologies. These include infrastructure, availability of skilled workers and financial resources, organizational culture, institutional policies, and user attitudes. Although these factors are critical in the implementation of library and information services through mobile phone technology, studies done in various parts of the world have shown that many institutions struggle to have all of them in place thereby compromising on project implementation. For instance, Chaputula and Mutula (2018: 270) conducted a study that used the multi-case study method to investigate the e-readiness of public university libraries in Malawi to use mobile phones in the provision of library and information services. Findings of the study revealed that public university libraries in the country had the ICT infrastructure necessary for offering library and information services on the mobile phone platform that included mobile phones, servers, WIFI, and computers. Similarly, user attitudes to the offering of such services were positive. However, the institutions studied lacked operational ICT policies and well-trained human resources in adequate numbers to aid the delivery of library services through mobile phones. The study further noted that high service costs and poor network quality, among others, could derail service delivery.

In another study done in the West Africa Region, Kari (2019:1) used the descriptive survey research design to survey the attitudes of librarians drawn from federal and state university libraries in Nigeria and undergraduates from the University of Nigeria, Nsukka. The findings of the study showed that library users and librarians were aware of mobile technologies and were ready to apply them in delivering and accessing library services. The perceived cheerful outlook to the implementation of library services through mobile phone technology, as exemplified by librarians and users in this study, could smoothen their deployment in academic libraries.

Elahi, Islam and Begum (2018:37) conducted another social survey-based research whose aim was to investigate the perception of Library and Information Science (LIS) professionals on the use of mobile phones in retrieving information from academic libraries. The findings of this study are noteworthy as they showed a strong cheerful outlook and perception of the LIS professionals towards the use of mobile phones in retrieving information from libraries, a development that could pave the way for the introduction of library services through mobile phones in libraries. Much as this was the case, the study exposed some technical and administrative barriers that need to be overcome to ensure the smooth implementation of library services through mobile phone technology. These include low bandwidth, huge cost of running the service, budget constraints, administrative inefficiencies, lack of awareness, and fear of innovation. Theories focussing on the adoption and

use of information systems such as the Diffusion of Innovation (DoI) by Everett Rogers (2003) have likewise highlighted fear as one of the drawbacks to the proliferation of innovations that include the usage of mobile phones in various spheres of life. Therefore, companies and individuals working on the implementation of various ICT-related projects should formulate workable strategies of how this aspect should be overcome if their projects are to succeed.

A more recent study conducted by Acheampong and Dei (2020) in Ghana investigated the preparedness of management for the implementation of library services in academic libraries through mobile technology. The researchers did the study after noting that many libraries were not providing mobile technology (m-tech) based library services although they were widely used by their client base.

The study that made use of the descriptive social survey methodology collected data from 365 library staff. Findings showed that a lack of a culture of training for staff and requisite skills are the main inhibitors to the adoption of m-tech in libraries. The findings of this study are significant as they show that the existence of the technical infrastructure alone is not enough to ignite a push towards the implementation of MTech-based library services as training plays an equally important role. Another important aspect to consider is to create hunger or indeed the need for such services amongst LIS practitioners. The DOI identifies relative advantage, which is defined as 'the degree to which an innovation is perceived as being better than the idea that it supersedes' (Rogers 2003, p.229), as a critical element in the diffusion of an innovation. It is only when LIS practitioners consider mobile technology indispensable to the work, they do that they will be open to its adoption.

4 Methodology

This section describes the methodology that was used in conducting this study.

4.1 Design

The study adopted the single-case research design. This design is appropriate for this study because it focuses on one institution (NUST Library) thereby allowing a more detailed, holistic, and in-depth exploration of the case (Kumar 2019:196). The case study design was further selected for use in this research on the basis that it accommodates the use of mixed methods that ensures that the case is investigated from multiple angles to ensure that findings made from one method are corroborated by those made through another method.

4.2 Approach

Creswell and Creswell (2018:3) define a research approach as a plan or procedure for conducting a research study that spans from broad assumptions to detailed methods for data collection, analysis, and interpretation. The choice of methods to use is dictated by the nature of the research problem being investigated but a researcher's personal experiences and research design also play a role. In this study, the researchers opted to use mixed methods (qualitative and quantitative) because of the nature of the case being investigated that necessitated collection of qualitative and quantitative data to ensure that a holistic picture emerges.

4.3 Population, sampling procedure and sample size

This study covered 483 postgraduate students enrolled in the University's 7 faculties and schools namely the Faculty of Human Science; Faculty of Engineering; Faculty of Computing, Informatics, Health and Applied Science; Harold Pupkewitz Graduate School of Business; Faculty of Management Sciences; and Faculty of Natural Resource and Spatial Sciences. Total enumeration sampling was used to solicit a sample for this study group implying that all the 483 students were included in the study. This was done because the population was small and hence manageable. This sampling method was used to boost the overall response rate after noting that email that was selected to be used as a data collection procedure tends to give a lower response rate.

The study purposively sampled the Head of Client Services, Head of Research Commons and Head of Harold Pupkewitz Graduate School of Business including the ICT Manager. In total three librarians and one ICT Manager were sampled. These individuals were thought to have the knowledge needed to achieve the study's objectives hence their inclusion in the study.

4.4 Data collection instruments and methods

Two data collection instruments were used: Interview guides and questionnaires. Interview guides were used to collect qualitative data while closed-ended questionnaires were used to collect quantitative data. Interview guides were used for

conducting interviews with librarians. Appointments were made with the interviewees, and the interviews were done in their respective offices.

The questionnaires were administered by one of the researchers to the student respondents through email between September and October 2018. Two reminders were made to the respondents over the period to boost the response rate.

4.5 Data analysis

The researchers analysed quantitative data using Microsoft Excel to produce descriptive statistics. In contrast, qualitative data were analyzed thematically. The results obtained from the two data sets were integrated and used for answering the questions posed in this study.

5 Findings

5.1 Response rate for the study

Findings contained in Table 1 show that 122 students responded to the questionnaires administered representing a response rate of 25%. This is not entirely surprising as emailed questionnaires tend to give a lower response rate. The majority of the respondents 26 (21.3%) came from the Harold Pupkewitz Graduate School of Business and the Faculty of Computing and Informatics, respectively. On the other hand, the least number 11 (9%) came from the Faculty of Natural Resources and Spatial Sciences.

Table 1: Response rate for the study

Faculty	Postgraduate students	Response	Relative Frequency
Faculty & Research Support Human Science	30	17	13.9%
Faculty of Engineering	92	18	14.8%
Faculty of Computing & Informatics, Health & Applied Science	132	26	21.3%
Harold Pupkewitz Graduate School of Business	48	26	21.3%
Faculty of Management Sciences	127	24	19.7%
Faculty of Natural Resource & Spatial Sciences	54	11	9.0%
Total	**483**	**122**	**100%**

The researchers interviewed four librarians namely the Head of Client Services, the Head of Faculty Librarians, and Librarians responsible for Research Commons and Harold Pupkewitz Graduate School of Business including the ICT Manager. This shows that a total of five interviews were conducted.

5.2 Factors that may influence the implementation of library and information services through mobile phone technology

Implementation of library services through mobile phone technology is a complex exercise that demands the pooling together of many resources. It is in this vein that the study inquired about the availability and suitability of the ICT infrastructure, human resources, the skill set of staff, and electronic resources that could be offered through mobile phones. This was done to determine the readiness of the NUST Library to implement library services through mobile phone technology.

Librarians were asked to indicate when they planned to implement or begin using mobile phone technology as well as which services they would offer through mobile phones. According to one librarian, NUST Library intends to use mobile phone technology to send SMS messages to clients who have overdue materials to either renew or return them on time. The second librarian stated that there is a provisional SMS service for postgraduate students to access e-resources, e-journals, e-books, and others, as well as for lecturers to access library materials in the library's Short Loan Section. The third librarian stated that the library provides SMS services for distance and remote students to enable them to access library services such as APA referencing, information literacy classes, and others.

Librarians were further asked to indicate their thoughts on the NUST Library's ICT infrastructure for supporting and facilitating the use of mobile phone services. According to one of the librarians, the infrastructure and networks of the Department of Information and Communications Technology (DICT) were used because the library does not have a Systems Librarian. Another librarian responded that DICT provides infrastructure for both the library and the entire University. According to the third librarian, NUST has a poor technological infrastructure, and Namibia as a country is still lagging in terms of Information and Communications Technology infrastructure. Librarians were asked if NUST Library staff

possessed the necessary skills to assist in the implementation of mobile phone services in the library. “Yes,” all the librarians said, “NUST has qualified employees.”

The ICT Manager was asked if his department were able to provide technical support related to the use of mobile phones to provide library and information services, and whether such support would include book requests, book recalls due date notifications, and other features. The ICT Manager responded that the Library might be assisted if it followed proper procedures. When asked what infrastructure resources would be needed to complete this task, the manager stated that they do have Wi-Fi infrastructure. The ICT Manager was further asked to say if the network was able to support the implementation of mobile library services. The response was that wireless access was available throughout the NUST campus. He also stated that the NUST network services are adequate for students and staff.

The ICT Manager was then questioned on the affordability of connectivity fees, which would allow the Library to provide mobile library services to its clients. According to the ICT Manager, the University does not charge students, staff, or outside users for internet access. The ICT Manager was asked if ICT staff possessed the necessary skills to support the provision of library and information services using mobile phone technology. He responded to this question in the affirmative saying that the DICT staff has relevant skills and is qualified in network software and hardware management. The ICT Manager was asked if they had a policy in place to guide the project's implementation. The ICT Manager stated that no policies were in place, but that in such projects, DICT would be required to establish policies for the services provided.

Table 2: Resources used by students

Resources	Yes	No	Total
E-books	70 (61.9%)	43 (38.1%)	113 (100%)
E-Journals	71 (67.6%)	34 (32.4%)	105 (100%)
Library website	81 (72.3%)	31 (27.7%)	112 (100%)
OPAC	44 (42.3%)	60 (57.7%)	104 (100%)

The researchers inquired about the availability of e-resources and services in the Library that can potentially be offered through mobile phone technology and assessed their level of usage by students. Findings contained in Table 2 show that the majority of the students 81 (72.3%) used the library website. E-Journals 71 (67.6%) and e-books 70 (61.9%) were the other e-resources available in the Library that was widely used by the students whereas the Online Public Access Catalogue (OPAC) 44 (42.3%) was used less. The availability of these resources coupled with their wide usage by students implies that they could be made accessible using mobile phone technology.

Table 3: Implementation of the mobile phone library service

Response	Strongly agree	Agree	No opinion	Disagree	Strongly disagree	Relative Frequency
Online Public Access Catalogue	49 (43.4%)	53 (46.9%)	9 (7.9%)	1 (0.9%)	1 (0.9%)	113 (100%)
Short message services alert	33(32.7%)	42 (41.6%)	21 20.9%)	2 (2.0%)	3 (3.0%)	101 (100%)
Library instructions	31 (32.3%)	50 (52.1%)	9 (9.4%)	4 (4.2%)	2 (2.1%)	96 (100%)
Audio/visual tours	37 (37.8%)	39 (39.8%)	10 (10.2%)	10 (10.2%)	2 (1.6%)	98 (100%)
Mobile instructions	34 (34.6%)	42 (42.8%)	10 (10.2%)	8 (8.1%)	4 (4.0%)	98 (100%)

The study also asked students to indicate services they wished to see implemented on the mobile phone platform. Findings presented in Table 3 show that students recommended the introduction of the Online Public Access Catalogue, short message services alert, library instructions, audio/visual tours, and mobile instructions with over half of all students backing their introduction. The largest number of students 102 (90.3%) favoured the delivery of mobile library services through OPAC as they either strongly agreed or agreed to its introduction. The second-largest number of students 81

(84.4%) were for delivery of library instructions via mobile phone technology. Audio/visual tours 76 (77.6%), mobile instructions 76 (77.4%) and short message services (SMS) alert 75 (74.3%) were the other services whose introduction was backed by many students.

5.3 Library users' attitudes towards accessing library and information services through mobile phones

The researchers triangulated data obtained from interviews conducted with librarians and questionnaires administered to students to obtain information that provided answers to the theme stated above.The researchers asked librarians to indicate if they were familiar with students' attitudes towards the use of mobile phones to access library and information services. One librarian stated that she may not have a definite answer as no survey or study had been conducted to determine this. However, she assumed that students would use mobile phone technology if given the opportunity. The other librarian shared a similar view saying: "I don't know because no study has been done yet," but then added, "in today's world, one cannot do without technology and students may use mobile phones more than personal computers or laptops."

Yet another librarian stated, "I don't know their attitudes because it hasn't been assessed yet but as you walk around the Library you will notice students using mobile phones rather than laptops or personal computers." On this question, it can be concluded that while librarians acknowledged that students' attitudes to the use of mobile phones to access library services were not known, they were positive about the likelihood of students adopting them for accessing library services if they were used based on current user trends that pointed to heavy usage of mobile phones for various tasks. The librarians further supported plans to install mobile phone technology at NUST Library, believing that it would benefit both the library and the user community. This shows that librarians and students embraced positive attitudes to the introduction of mobile library services in the NUST Library.

The study also assessed the attitudes of students to identify factors that could either facilitate or derail the introduction of library services through mobile phone technology. In this regard, the study found that, overall, user attitudes were positive. The study found that over 50% of the students were of the view that mobile internet is available anytime, anywhere; mobile internet is more dependable, and it is easier to access services using mobile phones. Likewise, other students backed the offering of library services through mobile phone technology based on the shortage of personal computers in the computer labs. Detailed results are found in Table 4. On the other hand, it was noted that the small screen size of the mobile phone that makes reading difficult and the high cost of mobile Internet could affect the offering of library services through mobile phone technology. These findings are displayed in Table 5.

Table 4: User perceptions of NUST Library resources and services.

Response	Strongly agree	Agree	No opinion	Disagree	Strongly disagree	Total
Mobile internet is available anytime, anywhere, hence more convenient to use	57 (47.1%)	49 (40.5%)	3 (2.5%)	9 (7.4%)	3 (2.5%)	121
Mobile internet is more reliable	23 (19.7%)	46 (39.3%)	20 (17.1%)	21 (17.9%)	7 (6.0%)	117
Personal computer shortage in computer labs	22 (19.1%)	38 (33.0%)	28 (24.3%)	19 (16.5%)	8 (7.0%)	115
Frequent power outages in computer labs	6 (5.2%)	21 (18.1%)	34 (29.3%)	39 (33.6%)	16 (13.8%)	116
Book shortages in the library	13 (11.2%)	37 (31.9%)	19 (16.4%)	34 (29.3%)	13 (11.2%)	116
It is easier to access services using mobile phones	31 (26.5%)	54 (46.2%)	10 (8.5%)	16 (13.7%)	6 (5.1%)	117

Table 5: Perceived difficulties in accessing information using mobile phones

Response	Strongly agree	Agree	I do not know	Disagree	Strongly disagree	Total
The small screen size of the mobile phone makes reading difficult	55 (45.8%)	38 (31.7%)	2 (1.7%)	18 (15.0%)	7 (5.8%)	120

Mobile internet is very costly	36 (28.1%)	43 (33.6%)	7 (5.5%)	36 (28.1%)	6 (4.7%)	128
I do not own an internet-enabled phone	9 (7.7%)	10 (8.5%)	14 (12.0%)	40 (34.2%)	44 (37.6%)	117
The library website is not mobile-friendly hence difficult to scroll on the screen of mobile phones or mobile devices	22 (18.5%)	36 (30.3%)	16 (13.4%)	37 (31.1%)	8 (6.7%)	119
Outdated information on the library website	6 (5.0%)	25 (20.8%)	35 (29.2%)	37 (30.8%)	17 (14.2%)	120

5.3 Challenges likely to be faced in using mobile phone technology in offering and accessing library services

Respondents were asked to indicate the difficulties they would face in accessing library and information services if they were offered through mobile phone technology. Findings captured in Table 6 show that high service costs, poor network quality, and library policies that prohibit the use of mobile phones in the library are the major challenges students would face when using mobile phones to access library services. These factors were picked by over 50% of the respondents. On the contrary, mobile phones (mobile devices) quickly get outdated, lack of knowledge on usage, and failure to receive responses to queries were not considered as factors that could seriously affect the offering of library services through mobile phone technology.

Table 6: Challenges to be faced in using mobile phone technology in offering and accessing library services

	Strongly agree	Agree	No opinion	Disagree	Strongly disagree	Total
High service costs	47 (41.2%)	38 (33.3%	16 (14.0%)	12 (10.5%)	1 (0.9%)	114
Poor network quality	32 (28.1%)	43 (37.7%)	17 (14.9%)	18 (15.8%)	4 (3.5%)	114
Mobile phones (mobile devices) quickly get outdated	17 (15.2%)	28 (25.0%)	26 (23.2%)	34 (30.4%)	7 (6.3%)	112
Lack of knowledge on usage	14 (12.3%)	36 (31.6%)	12 (10.5%)	34 (29.8%)	18 (15.8%)	114
Received no response to queries	8 (7.1%)	37 (33.0%)	40 (35.7%)	25 (22.3%)	2 (1.8%)	112
Library policies that prohibit the use of mobile phones in the library	43 (37.7%)	28 (24.6%)	18 (15.8%)	17 (14.9%)	8 (7.0%)	114

The librarians were also asked to mention the difficulties they expected to face if they began using mobile phones to offer library and information services. One of the librarians admitted that students and staff needed to participate in the trial of the SMS alerts service to build their capacity. Another librarian suggested that staff members (Library Assistants and Senior Library Assistants) be trained on how to use the software systems to ensure that they are better prepared to offer the service.'

Another librarian mentioned financial constraints and budget cuts as some of the challenges. The librarian emphasized the importance of marketing and advertising such a trial on NUST FM Radio so that all students and staff members could participate. Another librarian mentioned that staff members needed training and workshops on how to use mobile applications, library APPs, SMS alerts, and the AirPAC. In summary, lack of requisite skills, financial constraints, and lack of knowledge of the services offered on the part of users are the challenges librarians feared could affect the offering of library services through mobile phone technology.

6 Discussion of findings

6.1 Factors that may influence the implementation of library and information services through mobile phone technology

The study found that NUST Library was already offering library services through mobile phone technology but with a limited-service portfolio and user base. It was noted that out of a wide range of the services available, the Library only launched the Short Message Service (SMS) service which was used for offering user services and marketing library resources,

targeting distance learning students, postgraduate students, and academic staff. Face-to-face undergraduate students that form the largest client base of the Library were not covered by this service. The SMS service was used to send overdue reminders. Findings further showed that SMSs were used for promoting the usage of electronic resources and information literacy classes.

These findings augur well with those made in related studies on the topic which have shown that many academic libraries drag their feet in introducing mobile library services although such services are in great demand by their clients. This reflects what Acheampong and Dei (2020) found in their study done in Ghana that showed that many libraries were not providing mobile technology (m-tech) based library services although they were widely used by their client base. This situation was also found at the NUST Library in Namibia where it was noted that the use of mobile library services was restricted to the SMS service. This happened when the majority of its clients had phones capable of accessing OPAC, e-books, e-journals, and even the library website through mobile Internet and were also ready to access these services through mobile phones. Failure to make these services accessible on the mobile phone platform has the potential to limit their utilization by staff and students.

The study further found that the ICT infrastructure for the implementation of library services through mobile phone technology was in place. However, appropriate policies were lacking. Likewise, a study conducted by Chaputula and Mutula (2018) to investigate the e-readiness of public university libraries in Malawi to use mobile phones in the provision of library and information services made corresponding findings. The study revealed that the institutions studied lacked operational ICT policies and well-trained human resources in adequate numbers to aid the delivery of library services through mobile phones. The fact that these findings emerged in this study shows that academic institutions faced similar challenges and hence need to learn from others that have successfully implemented these services to ensure that they are better prepared for their introduction.

6.2 Library users' attitudes towards accessing library and information services through mobile phones

The study found that students' and librarians' attitudes were positively aligned with the introduction of library and information services through mobile phone technology. Librarians acknowledged that students' attitudes to the use of mobile phones to access library services were not known but they were positive about the likelihood of students adopting them for accessing library services if they were used based on current user trends that pointed to heavy usage of mobile phones for various tasks. The librarians, on their part, supported plans to commence the offering of services through mobile phone technology at NUST Library in the hope that it would benefit the Library and the user community. This shows that librarians embraced positive attitudes to the introduction of mobile library services at the institution.

The majority of the students supported the introduction of mobile library services because of the perceived benefits the services would accord them. For instance, it was pointed out that mobile internet is available anytime, anywhere; mobile internet is more dependable, and it is easier to access services using mobile phones. Furthermore, students indicated that the offering of library services through mobile phone technology would fill up the gap created by the shortage of personal computers in the computer labs. These findings are a vindication of the DOI theory advanced by Everett Rogers (2003) which stipulates that people will only adopt an innovation based on the benefits accrued through its usage. In this case, the benefits that would stem from the usage of mobile phone technology to access library services look to have swayed students' attitudes.

These findings that showed users' positive attitudes to the offering of library services through mobile phone technology reflect what has been obtained in related studies. For instance, a survey of attitudes of librarians drawn from federal and state university libraries in Nigeria and undergraduates from the University of Nigeria, Nsukka conducted by Kari (2019:1) revealed that students and librarians were ready to apply mobile technologies in delivering and accessing library services. Another study done by Elahi, Islam and Begum (2018:37) showed a strong cheerful outlook and perception of the LIS professionals towards the use of mobile phones in retrieving information from libraries. It is pleasing to note that students' and librarians' attitudes to the usage of mobile technologies in libraries in this study are positive as has been seen in other studies. But as it has already been discussed, positive attitudes alone are not enough. The critical issue is to move beyond this to full implementation, and this is what is lacking in many institutions.

6.3 Challenges likely to be faced in using mobile phone technology in offering and accessing library services

Librarians identified several challenges they feared could affect the offering of library services through mobile phone technology. These are lack of requisite skills, financial constraints, and lack of knowledge of the services offered. The skillset applied to library staff as they needed to be trained it is a new service which they had no experience in offering. Financial challenges may apply to both the library and its users. The Library will be required to buy new specialised equipment such

as computers and software to ensure smooth implementation of the services. Similarly, students may also need to buy new phones or replace them when they become faulty, hence incurring expenses. The new service to be offered may also need to be marketed to boost usage. Failure to do so would create a knowledge gap that may negatively affect usage.

The study further made several findings relating to challenges that students would face when using mobile phone technology for accessing library services. They included high service costs, poor network quality, and library policies that prohibit the use of mobile phones in the library. Librarians also highlighted the issue of network quality hence needs to be addressed before the roll-out of the services. The aspect of the service cost may only apply when students are using their data for accessing services as the study found that Internet access at the NUST Campus is free of charge. Students should, therefore, be encouraged to use the campus WIFI for accessing the services. In terms of policy regime, the institution should address it by revising library policies that prohibit the use of mobile phones in the library. Policies guiding operations of mobile library services that were found not to be in place should also be developed.

A study conducted by Chaputula and Mutula (2018) in public university libraries in Malawi also made similar findings. The study found that the institutions studied lacked operational ICT policies and well-trained human resources in adequate numbers to aid the delivery of library services through mobile phones. The study further noted that high service costs and poor network quality could derail service delivery. Similarly, the diffusion of innovation theory states that the uptake of any technology will be high if obstacles that stand in the way of its adoption are cleared. Having identified these factors as inhibitors to the adoption of mobile library services, NUST should take steps to mitigate their impact to ensure high uptake of the services.

7 Conclusion and recommendations

The study was undertaken to assess the readiness status of NUST Library to use mobile phone technology in the delivery of library and information services. Findings showed that the ICT infrastructure necessary for the implementation of library services through mobile phone technology was in place although there were gaps in some areas. Irrespective of this, the institution did not have a relevant ICT policy and the Library staff lacked adequate training in the implementation of services on the mobile phone platform. Another important finding was that library staff and students embraced positive attitudes to the offering of these services. Attitudes are a key driver to action hence this finding was deemed critical as the services that may be offered would thrive. Finally, the study found that some challenges could derail the offering of services through mobile phone technology if they were not addressed. They included financial constraints, lack of knowledge of the services to be offered, high service costs, poor network quality, and library policies that prohibit the use of mobile phones in the library. However, it was noted that these challenges are surmountable. Based on these findings, the study concluded that NUST Library was ready to implement the use of mobile phone technology in the delivery of library and information services.

The study found that several factors may affect the offering of library services through mobile phone technology. For instance, it transpired that although the ICT infrastructure was in place, its performance was not satisfactory. Considering that the ICT infrastructure is central to the offering of services through mobile phone technology, it is recommended that the ICT Manager should work with Library staff to address areas of concern. Human capital is equally important. However, it was noted that the Library staff lacked relevant training. It is therefore recommended that the Director of Library Services should address the training needs of staff before the rollout of services. Findings further highlighted budgetary constraints as a barrier to the use of mobile phone technology to offer library services. It is therefore recommended that the Library and University administration should ensure that adequate funding is available to assist in the rollout of these services. Ideally, NUST should have a separate budget to support technological projects from which the Library should be able to draw funds for the implementation of these services.

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