Library-related uses of mobile phones

by Aubrey Chaputula

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Factors Impacting Library-related Uses of Mobile Phones by Students in Public Universities in Malawi

Introduction

Mobile phones (feature phones and smartphones) have of late become ubiquitous among university students (Brooks, 2015; Haverila, 2013). Whilst ownership of feature phones has in some studies reached the 100 percent mark (Dewah and Mutula, 2013; De Wee, 2013), that of smartphones is steadily edging towards reaching the same threshold (Brookes, 2016; Nowlan, 2013). If the trend continues, it is anticipated that smartphone ownership will reach saturation point within the next few years.

University libraries in various parts of the world are taking advantage of the proliferation of mobile phones among students (Brookes, 2016; Kumar, 2014) coupled with the tremendous computing power they possess (Hossain and Ahmed, 2016) to offer services to their clients (Bomhold, 2014; Luo, 2014). Mobile phones are used to deliver user services (book renewals, e-book and e-journal access), reference services (user queries and instructional services), informational services (notifications), etc. Mobile phones, particularly smartphones, are increasingly used to provide library and information services because they have the potential to enhance access to library resources beyond the normal opening hours hence can assist to overcome the obstacles of time and space (Malik and Mahmood, 2013), and bring convenience to library users (Ballard and Blaine, 2013). Moreover, mobile phones can help to provide access to e-resources to students who do not have access to institutional computer facilities in resource-poor environments such as those in Africa (Palumbo, 2014).

Studies have shown that university students have largely responded positively to the availability of library and information services on the mobile phone platform through increased usage (Kubat, 2017; Hossain and Ahmed, 2016). Much as this is the case, usage of the services ranks lower when compared to other services students access using their mobile phones that include communicating with friends and family through calls, text, SMS, or email; connecting to social media tools such as Facebook; and playing games (Lo et al., 2016; Vassilakaki et al., 2016). Other studies have pointed to technological characteristics associated with mobile phones such as the small screen size, slow Internet speed, and cost of accessing services as factors militating against access to library services offered through mobile phones (Luo, 2014; De Wee, 2013). Nevertheless, studies by Vassilakaki et al. (2016) and Lo et al. (2016) show

that the small screen size of most mobile phones, slow Internet speed, and cost, among others, seem not to have affected university students' use of mobile phone for social or communication purposes. This makes the researcher to believe that other challenges beyond what is stated in the literature exist that affects usage of mobile phones for accessing library services using mobile phones. This study was, therefore, undertaken to uncover such challenges, and it addressed the following research questions:

(1) What are the ownership rates of mobile phones by students in public universities in Malawi?
(2) What are the library-related uses of mobile phones by students in public universities in Malawi?
(3) Which factors impact usage of mobile phones by students?

Mobile phones have the potential to change library service delivery in the tertiary educational sector. Therefore, studies such as this one are vital as they would pave the way for policy, practical and managerial interventions in areas of infrastructure development, capacity building, awareness creation, institutional framework and budgetary support, among others, to enhance use of mobile phones to provide library and information services not only in public university libraries in Malawi but also beyond.

Literature review

Mobile phone ownership

Literature indicates that mobile phones (feature phones and smartphones) amongst university students the world over are ubiquitous (Brookes, 2016; Dahlstrom et al., 2015; Dahlstrom and Bichsel, 2014; Kumar, 2014; Zhang et al., 2016). For instance, a study conducted by Becker et al. (2013) at Hunter College in New York that involved 613 students, and made use of an open survey method indicated that 98.7% of the students owned mobile phones. Similarly, the ECAR (2004) study found that only 1.1% of American undergraduate students owned a smartphone in 2004. However, recent ECAR studies (Brookes, 2016; Dahlstrom et al., 2015; Dahlstrom and Bichsel, 2014) show that smartphone ownership has grown exponentially over the past four years; shooting up from 76% in 2013 to 86% in 2014 before leapfrogging further to 92% in 2015. Moreover, smartphone ownership increased from 92% to 96% between 2015 and 2016.

A related study conducted by Kumar (2014) at Jawaharlal Nehru University (JNU) in India that involved a randomly selected sample of 180 students indicated that 93.89% (96.84% males and 90.59% females) of the students had either a smartphone or an ordinary phone. More importantly, this study revealed addictive tendencies associated with mobile phones among the students whereby the majority of the respondents (71.6%) could keep a mobile phone close at all times while (82.25%) stated that they could survive without food for one day but not without a mobile phone. This study further noted that the larger percentage of female students displayed addictive tendencies to mobile phones than male students.

The researcher did not come across studies on student ownership of mobile phones in public universities in Malawi, and finding out ownership rates and functionality of those phones is key to determining their potential deployment in accessing library services. However, studies conducted on the African continent have similarly shown mobile phone ownership to be high amongst university students. A study conducted by Akeriwa et al. (2015) at the University of Development Studies Library in Ghana that involved 155 graduate students found that 98.3% of the respondents owned a mobile phone. Another study conducted by De Wee (2013) at the University of Pretoria revealed that all the 15 students interviewed owned an Internet-capable mobile phone representing a 100% ownership rate. This study further reveled that two of the respondents owned two mobile phones but the second mobile phoned owned was not Internet-capable. A more recent study conducted by Dewah and Mutula (2013) on mobile phone access and use among students at the National University of Science and Technology (NUST) in Zimbabwe, targeting fourth year undergraduates and master's students found that all the students surveyed owned a mobile phone. Yet another study conducted by Fasae and Adegbilero-Iwari (2015) that involved 80 science students in privately-owned Afe Babalola University and Joseph Ayo Babalola University in Nigeria revealed that 83.8% of the respondents used smartphones.

Uses of Mobile Phones among Students

Literature shows that students deploy mobile phones in a variety of tasks but differed greatly in the way they used them. Vassilakaki et al. (2016) conducted an online survey to investigate uses of mobile technology (laptop, desktop computer and mobile phone) among Library and Information Science undergraduate students in Greece. This study which sampled 336 students, and drew a response rate of 78.6% revealed that students' choice of which device to use depended on the task at hand. For instance, the respondents used their laptop, desktop computer

and mobile phone to search for information (63.6, 49.4, 20.8%, respectively), to read an e-book (36.4, 26, 23.4%) and e-journals (35.1, 31.226%), to send an e-mail (62.3, 42.9, 29.9%), to search for information (64.9, 52, 46.8%), and finally to download e-books (37.7, 27.3, 18.2%). These findings indicate that the respondents in this study preferred to use the laptop and desktop computers over the mobile phone for many academic and library-related activities. Similarly, the laptop and desktop computers were preferred over the mobile phone in accessing the library's OPAC (57.1, 36.4, 10.4%), user's library account (58.4, 40.3, 26%), searching for reference books (52, 37.7, 13%), browsing new acquisitions list (39, 23.4, 20.8%) and reserving books (24.7, 20.8, 5.2%). Conversely, the respondents used their mobile phones, laptops and desktop computers in that order to listen to music (74, 55.8, 42.9%), to search for photos (77.9, 63.6, 45.5%), for chatting (70.1, 62.3, 45.5%), to send a text message (76.6, 57.1, 42.9%), for accessing social networking sites (64.9, 63.6, 45.5%), to connect to the Internet (75.3, 64.9, 50.7%), and for playing online games (61, 50.7, 35.1%). These findings imply that the mobile phone was mainly preferred for social-related activities other than library or academic-related activities. Similarly, the ECAR (2015) study of USA undergraduate students' ownership and use of technology revealed that laptop computers were used more extensively for academic and library-related purposes by the students when compared to smartphones (Brooks, 2015). Findings of this study indicated that 93% of the students stated that laptops were very important for their academic success. On the contrary, only half of the respondents (46%) stated that smartphones were extremely important for academic purposes.

Lo et al. (2016) conducted another study whose aim was to explore art and design students' use of smartphones for accessing library services and learning at the Hong Kong Design Institute (HKDI). This study which surveyed 51 students discovered that majority of the respondents used their smartphones for accessing reference materials and databases, as well as browsing the website and social networking sites for learning purposes frequently (i.e. at least once per week). However, usage of smartphones for reading journal articles, e-books, as well as searching the library catalogue was minimal. These findings reflected those obtained in a study by Vassilakaki et al. (2016) in Greece in that they show that much as the respondents were prepared to use their smartphones for academic and library-related activities, such usage was much lower when compared to that of other technological devices such as laptops. Respondents in the study by Lo et al. (2016) indicated that the difficulty of browsing information on smartphones due to the design of the websites and applications made it difficult

for them to utilize their smartphones for this purpose. Therefore, resolving these technological challenges is key in making the mobile phone a leading device for library-related activities.

In yet another study, Hossain and Ahmed (2016) used a questionnaire survey to investigate the use of smartphones for academic purposes by students at Dhaka University in Bangladesh. Findings of this study indicated that the majority of the students (155, 74.9%) used their smartphones to read full-text articles. Other significant uses of smartphones that came up in this study were watching learning videos (117, 56.5%), recording class notes (94, 45.4%), and preparing class notes (75, 36.2%). Much as the majority of the respondents used their smartphones for accessing full-text articles which is a significant improvement from what was obtained in previous studies reviewed, use of smartphones for library reference (48, 23.2%) was evidently low.

Factors impacting usage of mobile phones to access library services by students

Studies have shown that several factors exist that negatively impact access to library services offered through mobile phones by students. Availability and good performance of the WIFI Network infrastructure is one of them. In most university campuses, the WIFI infrastructure either has limited coverage or is unreliable. For instance, the ECAR (2015) study of undergraduate students' ownership and use of mobile devices in the USA indicated that students living on campus rated their network experiences considerably lower than students living off-campus whereby only three in five students stated that they had reliable access to Wi-Fi throughout their campus (58%) or in classrooms/instructional spaces (63%) (Dahlstrom et al., 2015). This happened due to the large number of mobile devices which students connected to the campus network. The USA study revealed that 61% of students connected at least two devices to the campus network at the same time. Although all institutions may face this challenge, it is particularly problematic in the developing world as inadequate funding for the procurement of bandwidth coupled with unreliable electricity supply all conspire to frustrate the provision of efficient campus WIFI network.

The literature has also shown that cost is a factor in access to library and information service offered through mobile phone. For instance, a study conducted by Song and Lee (2012) of international students enrolled at the College of Business at the University of Illinois found that the high total cost of ownership (costs for handsets and monthly data plans) was the main reason

why 39% of the respondents did not own a tablet PC. Another study conducted by Luo (2014) at San Jose State University revealed that some of the respondents to the study did not access the SMS library service because they did not have a texting plan. Although cost has been identified as a factor in access to library services through mobile phones, trends on mobile phone usage as seen in studies by Lo et al. (2016) and Vassilakaki et al. (2016) show that students still used their mobile phones to access social media and to communicate to their friends and relations using emails, SMS texts and chats. It is therefore possible that students were prepared to pay for services they valued more, and access to library services could not be one of the services students consider as worth spending their financial resources on. An alternative view could be the availability of alternative means of accessing library services such as laptops or walking into the library to access the services which have prompted some students to prioritise their spending on other services.

In summary, the literature reviewed revealed that ownership of mobile phone is key to accessing library services and resources through mobile phone. Much as this is the case, type of mobile phone owned could have a big bearing as mobile phones differ substantially in terms of power and functionality which ultimately affects usage. Smartphones, for instance, are the most powerful type of mobile phone as they have computing power equivalent to that of some computers (Hossain and Ahmed, 2016). Therefore, finding out mobile phone ownership rates and functionality is key to determining potential deployment of the mobile phones for accessing library services and resources. Technological characteristics of mobile phones and cost of accessing mobile phone services have also been highlighted as factors that could impact usage of mobile phones for accessing library services. However, the literature has shown that students use mobile phones more for communication and social networking over access to library services. The observed disparities in usage makes one to wonder as to whether the technological factors and cost are indeed the main reasons for the reported low usage of mobile phones for accessing library services or other factors are to blame. This study is, therefore, meant to provide answers to this question.

Theoretical Framework

This study was underpinned by the Unified Theory of Acceptance and Use of Technology (UTAUT). UTAUT is a model that is often used in Information and Communications Technologies (ICT) related studies. The model was developed and validated by venkatesh et al. (2003) through the review, mapping and integration of eight dominant theories and models

that originated from different theoretical disciplines such as psychology, sociology and information systems (Williams et al., 2012; Kijsanayotin et al., 2009).

UTAUT was developed on the basis that constructs of existing theories were similar in nature, therefore, it was logical to map and integrate them to create a unified theoretical basis (Venkatesh et al. 2003). The model identifies four key drivers of the adoption of information systems: performance expectancy (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC) (Martin and Herrero, 2012). The model centres on two key issues namely behavioural intention (BI) and actual usage (AU). PE, EE and SI influence BI which in turn influences AU. Empirical studies have shown that FC, on the other hand, does not have any influences on BI but directly influences AU (Venkatesh et al. 2003). Besides the four main constructs of the model (PE, EE, SI and FC), UTAUT identifies the moderating effect of four other factors such as gender, age, experience and voluntariness of usage (Keong et al., 2012).

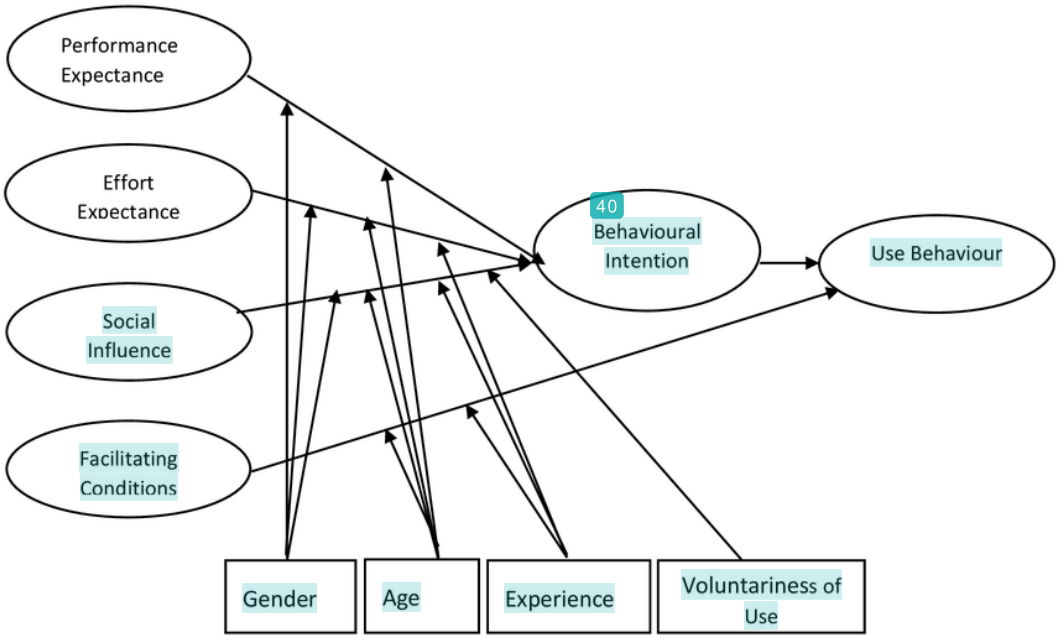

Figure 1: UTAUT (Source: Venkatesh et al., 2003)

The strength of the UTAUT model lies in the fact that it was founded on so many models and thus providing the researcher with a broader view of all existing models. Moreover, UTAUT is a much stronger model as it accounts for an explanatory power of up to 70% unlike the other

previous models that account for only between 17 and 53% of the variance in use intentions (Venkatesh et al., 2003). UTAUT has its own weaknesses too. Scholars such as Straub and Burton-Jones (2007) have claimed that the ten constructs of UTAUT are not parsimonious. In spite of this weakness, use of UTAUT in this study is justified on the basis that its strengths far outweigh its weaknesses. Besides, the model has been used in other related studies such as the study of the adoption of mobile devices (Carlsson et al., 2006), the use of 'near field communication' (NFC) adoption of mobile phone service (Chen and Chang, 2013), the use of mobile internet (Wang and Wang, 2010), library mobile applications in university libraries (Chang, 2013).

Methodology

This study made use of a multi-case study design. Malawi has four public universities. They include University of Malawi (UNIMA), Mzuzu University (MZUNI), Lilongwe University of Agriculture and Natural Resources (LUANAR), and the Malawi University of Science and Technology (MUST). UNIMA has four constituent colleges namely Chancellor College (CHANCO), Kamuzu College of Nursing (KCN), The Polytechnic, and College of Medicine (COM) whilst the other universities only have one campus. Although potentially seven study institutions existed, this research covered only five of them: MZUNI, LUANAR, The Polytechnic, COM and KCN. Libraries selected for this study are affiliated to older and well-established institutions except MUST which was established in 2013, and did not have students in third, fourth and fifth years at the time of data collection. CHANCO was not included in the study despite being older and well established because permission was not secured to access the respondents. The combined student population in the institutions studied exceed 10,000. The case study was deemed appropriate for this study because it enabled the researcher to examine the phenomena under investigation in-depth individually in the five institutions, and also draw conclusions collectively across the study sites (Creswell, 2013).

Self-completed questionnaires were administered to a sample of 370 students in years 3, 4, 5 and postgraduates drawn using a sampling table provided by Israel (2013). A decision to limit the study to these categories of students was made because they are involved in more intensive research activities hence capable of using their mobile phones for a wider range of purposes including library use. In total, 316 students out of the 370 sampled responded to the questionnaire representing an 85.4% response rate. Reliability of some of the questionnaire items in this study were determined by calculating the Cronbach's Alpha values of the variables

in the questions. The Cronbach's Alpha values were closer to 0.7 which shows that the items in the questionnaires used had high levels of internal consistency.

Research ethics was accomplished by, among others, getting gate keepers' permission before entering the study sites, and soliciting the informed consent of the participants before administering the questionnaires. Data for this study was collected between November 2015 to March 2016 by the researcher with the aid of five research assistants. The data collected was analysed using SPSS Version 23 to generate tables and graphs.

Results and Discussion

Mobile Phone Ownership

Mobile phone ownership is one of the key determining factors for mobile phone use. It was for this reason that the researcher investigated general ownership of the mobile phones amongst students. The study findings show that mobile phone ownership amongst students was very high with many of them owning one or more devices. Findings shown in Figure 2 indicate that 315 (99.7%) students owned a mobile phone whilst only 1 (0.3%) indicated that he or she did not own a mobile phone. The high ownership rates of mobile phones observed in the current study resemble findings made in a number of other studies. A study carried out by Becker et al. (2013) at Hunter College in New York (USA) found that 98.7% of the students owned mobile phones. Other related studies by Dewah and Mutula (2013) in Zimbabwe, De Wee (2013) in South Africa and Fasae and Adegbilero-Iwari (2015) in Nigeria similarly recorded very high mobile phone ownership rates amongst students.

Whereas 215 (68.5%) students indicated that they owned only one mobile phone, a significant part of the student body 90 (28.7%) indicated that they owned two mobile phones. Still more, 7 (2.2%) students indicated that they owned three mobile phones and only 2 (0.6%) students pointed out that they owned more than three mobile phones. These findings imply that much as single ownership of mobile phone was prevalent, dual and multiple ownership was increasingly becoming a trend which is a reflection of what was obtained in studies conducted De Wee (2013) in South Africa whereby students reported owning more than one mobile phone.

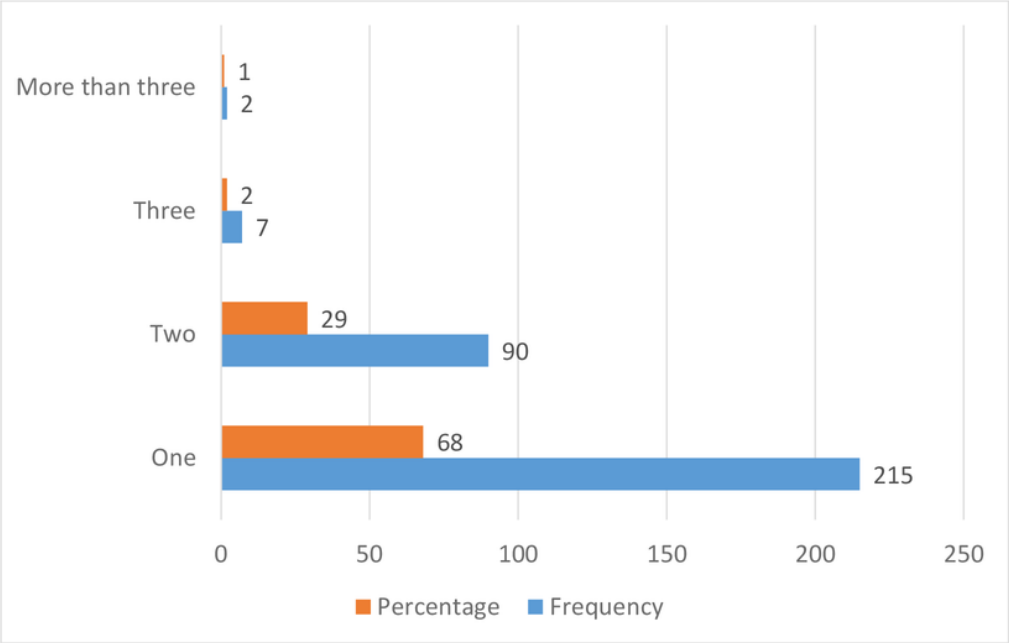

Figure 2: Mobile Phone Ownership among Students (N=314)

Source: Survey data, 2016

Internet capability of the mobile phones owned by students

As already indicated, the scope of the activities one is able to perform using a mobile phone is determined by the capabilities of the device owned. Internet-capable mobile phones, also commonly referred to as smartphones, have bigger screens and possess more computing power (Hossain and Ahmed, 2016) a development that enables them to perform more functions. Considering that most of the library services are now web-based, the study probed Internet capabilities of the phones owned by students to get a picture of the students' capacity to access web-based library services using the mobile web.

The study findings revealed that 299 (94.9%) students owned mobile phones with Internet capabilities whilst 16 (5.1%) owned mobile phones without this capability. Students who owned more than one mobile phone were asked to indicate how many of them had Internet capabilities. Forty-eight 48 (49%) students stated that two of their mobile phones had this capability whilst 46 (46.9%) indicated that only one of their phones had Internet capabilities. Moreover, 4 (4.1%) students had three or more mobile phones that had Internet capabilities. These findings that are shown in Figure 3.

The findings presented in this section signify that most of the students had the technical capacity to access most library services as most of their mobile phones had Internet capability. This implies that besides the web-based services offered in many libraries such as mobile databases, catalogues and circulation, the students could also access basic services that could be accessed on feature phones such SMS notifications, renewals and information services (Jetty and Anbu, 2013).

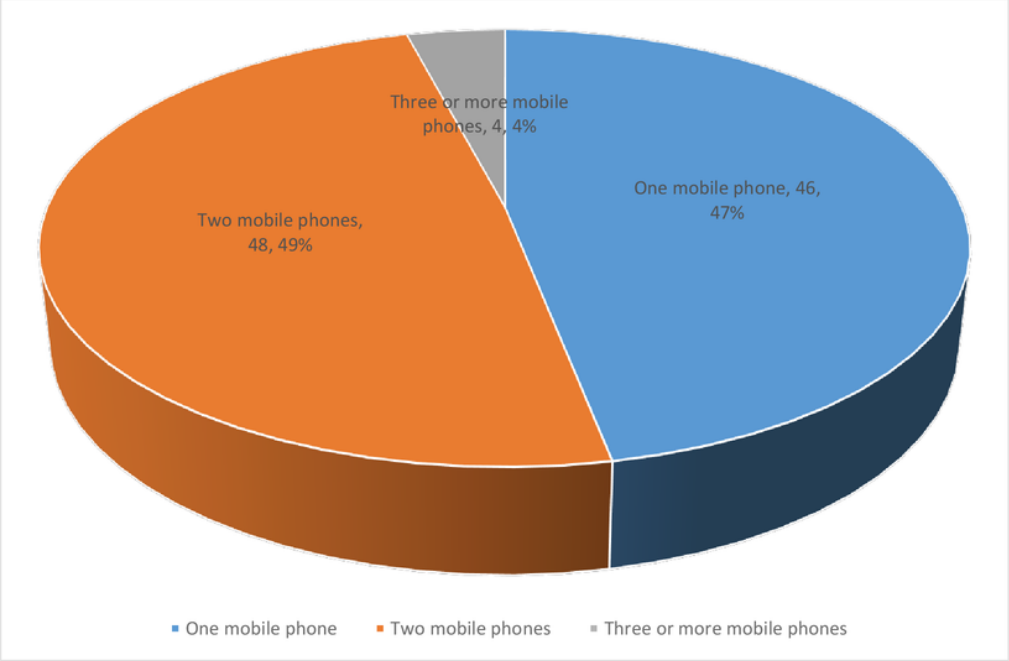

Figure 3: Number of Internet-capable Mobile Phones for Respondents Who Owned More than One Mobile Phone (N=98)

Source: Survey data, 2016

Internet capability is one of the important features of a smartphone, others being Wi-Fi capabilities, QWERTY keyboard (either physical or virtual), and touch screen (Song and Lee, 2012; Yu, 2012). Much as the study did not specifically find out whether the phones respondents owned were either smartphones or feature phones, this finding could point to a high prevalence rate of smartphones amongst the students and academic staff reflecting findings of a study by Palumbo (2014) who had observed that smartphones were becoming pervasive on the African continent.

Access to Library Resources Using Mobile Phones

The term "library resources" is used to refer to electronic information resources offered in many academic libraries. These include e-books, e-journals, library website and OPAC. In this study, students were asked to indicate if they have ever accessed these resources using their mobile phone. Findings of their responses are presented in Figure 4, and they show that majority of the students 165 (52.9%) had ever used their mobile phone to access e-books whilst an equally bigger percentage of them 149 (47.8%) had ever used their mobile phone to access e-journals. A considerable number of the students 110 (35.3%) also reported using their mobile phones to access the library website whilst only a few 37 (11.9%) used their mobile phone to access the OPAC. However, some of the respondents did not seem to understand what OPAC was, and perhaps its actual use could be much higher than what was reported in the study.

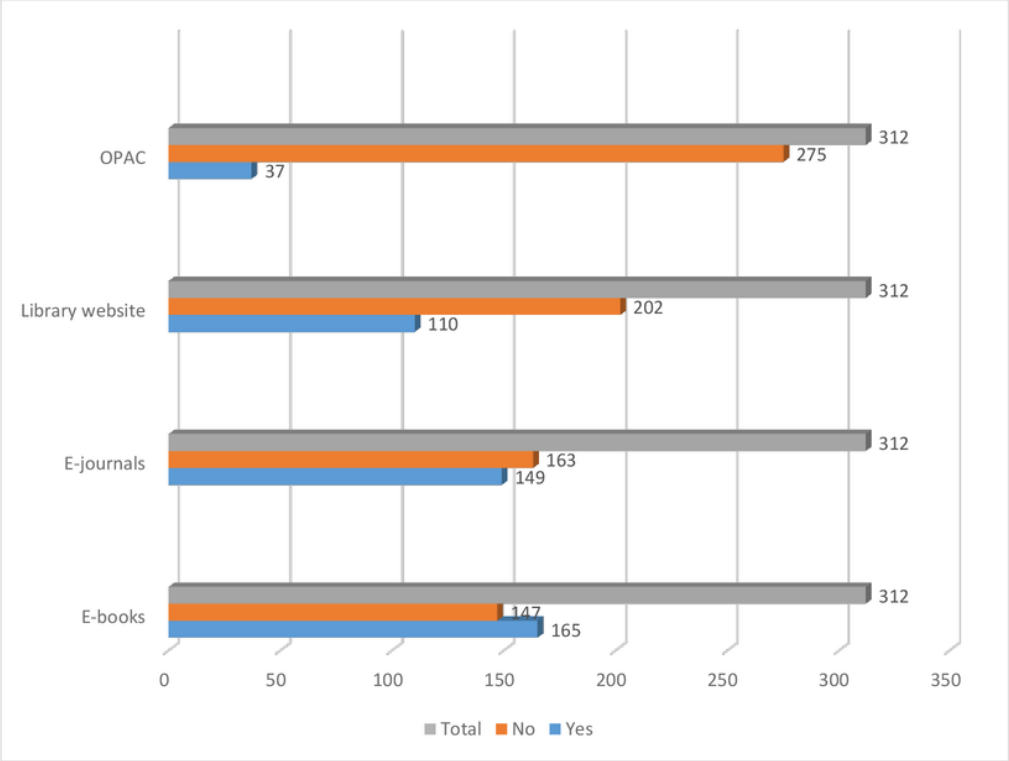

Figure 4: Access to Information Resources Using Mobile Phone by Students (N=312)

Source: Survey data, 2016

Studies conducted by Lo et al. (2016) in Hong Kong and Vassilakaki et al. (2016) in Greece have also shown that students used their mobile phones for library-related purposes. However, similar to what was established in the current study, the two studies revealed that usage of

mobile phones for reading journal articles, e-books, as well as searching the library catalogue was minimal. The study by Vassilakaki et al. (2016), in particular, indicated that most students shunned the use of mobile phone to access e-books, e-journals, library website and OPAC preferring instead to access these resources using laptop computers.

Use of mobile phone to access library reference services

Students were further asked to indicate if they had ever used their mobile phone to call, email or text the library to seek help or access any reference service. An analysis of their findings as presented in Table 1 show that cumulatively only 60 (20%) students had ever used their mobile phones to call, email or text the library to seek help or access reference services either rarely or frequently whilst the rest 240 (80%) were either not sure or had never used it.

Further analysis of the findings revealed that students at LUANAR 14 (34.1%) used their mobile phones to access reference services more than their colleagues in the other institutions, followed by their colleagues at KCN 4 (20%), The Polytechnic 23 (19.7%) and MZUNI 15 (19.5%). Students from COM used their mobile phones the least 4 (8.9%) to call, email or text the library to seek help or access any reference service.

Table 1: Students' Responses to Use of Mobile Phone to Call, E-mail or Text the Library to Seek Help or Access Reference Services (N=300)

Name of institution	Have you ever used your mobile phone to call, email or text the library to seek help or access any reference service?					Total
	Yes, frequently	Yes, but rarely	Not sure	Hardly use	Never used	
MZUNI	5	10	5	17	40	77
	6.5%	13.0%	6.5%	22.1%	51.9%	100.0%
KCN	0	4	0	9	7	20
	0.0%	20.0%	0.0%	45.0%	35.0%	100.0%
Polytechnic	9	14	8	38	48	117
	7.7%	12.0%	6.8%	32.5%	41.0%	100.0%
COM	1	3	2	15	24	45
	2.2%	6.7%	4.4%	33.3%	53.3%	100.0%
LUANAR	6	8	1	11	15	41

	14.6%	19.5%	2.4%	26.8%	36.6%	100.0%
Total	**21**	**39**	**16**	**90**	**134**	**300**
	7.0%	**13.0%**	**5.3%**	**30.0%**	**44.7%**	**100.0%**

Source: Survey data, 2016

Overall, usage of mobile phones by students to access reference services from the library was low. Much as this were the case, comparatively it was high at LUANAR and KCN. Related studies on the use of mobile phones to access library services have shown similar results. For instance, a study conducted by Hossain and Ahmed (2016) on the use of smartphones for academic purposes by students at Dhaka University in Bangladesh revealed that only (48, 23.2%) students used smartphones for library reference services. Similarly, an ECAR (2014) study of undergraduate students' use of technology discovered that over 50% students used their mobile devices (smartphones and tablets) to access library resources (Dahlstrom and Bichsel, 2014). Nevertheless, this figure was one of the lowest reported uses of mobile phones in that study.

Students who indicated that they have ever used their mobile phone to contact the library to access reference services were asked to indicate the mobile phone applications they used. An analysis of their findings as presented in Figure 5 revealed that students frequently used Instant messenger 31 (47%), e-mail 31 (47%), SMS 29 (43.9%) and call function 19 (28.8%) to contact the library. However, students did not frequently use social media tools such as Facebook, Twitter or WhatsApp 5 (7.8%) to contact the library to access reference services.

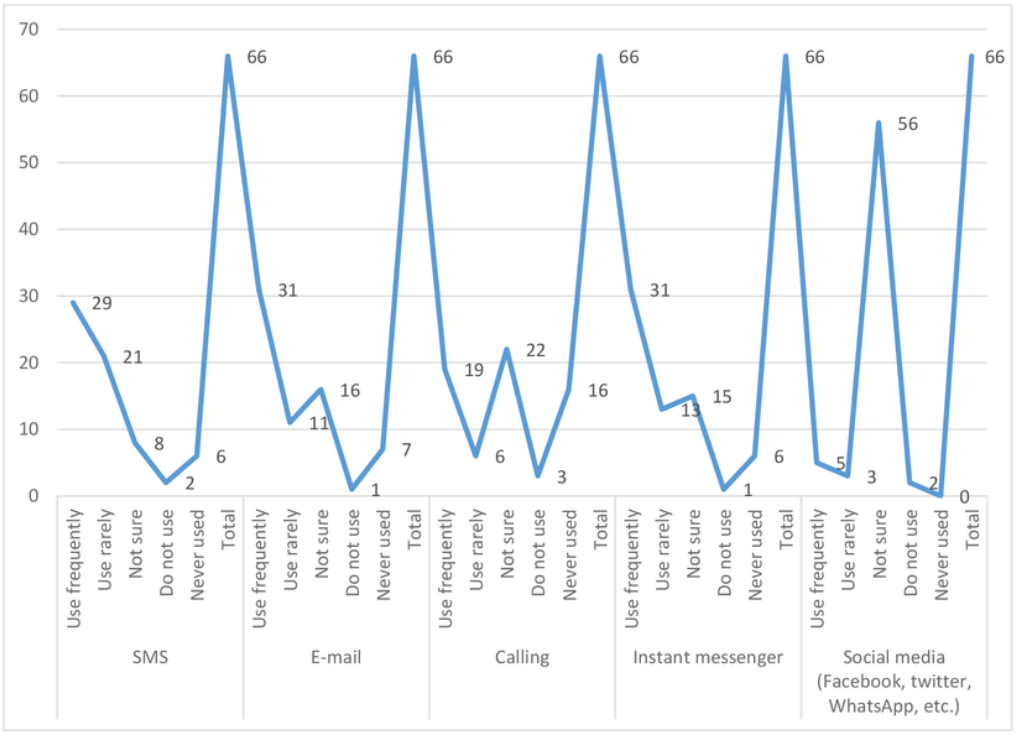

Figure 5: Mobile Phone Applications Students Used to Access Reference Services from the Library (N=66)

Source: Survey data, 2016

Factors impacting usage of mobile phones by students to access library resources and services

The respondents were asked to indicate why they used mobile phones over other available means i.e. laptop computers to access library resources and services. Findings to this query are presented in Table 2, and they show that majority of students either strongly agreed 143 (63.0%) or agreed 57 (25.1%) that they used mobile phone to access information resources over other available means such as laptops because mobile Internet was available from anywhere, anytime hence more convenient to use. The rest of the students either expressed no opinion 14 (6.2%), disagreed 11 (4.8%) or strongly disagreed 2 (0.9%) with this statement. Some of the reasons that made students to use mobile phones over other available resources were that it was easier to access services using mobile phone; because of PC shortage in the computer labs; mobile Internet was more reliable; and mobile Internet was cheaper to use. On the other hand, most of the students disagreed with the statement that they used mobile phone

over other available means because they were influenced by a friend or because of frequent power outages in computer labs.

Table 2: Why Students Used Mobile Phones over other Available Means i.e. Laptop Computers to Access Library Resources and Services (N=227)

Reason for using mobile phone over other means i.e. laptops	Strongly agree	Agree	No opinion	Disagree	Strongly disagree	Total
Mobile internet is available from anywhere, anytime hence more convenient to use	143	57	14	11	2	227
	63.0%	25.1%	6.2%	4.8%	0.9%	100.0%
Mobile internet is more reliable	66	82	47	29	3	227
	29.1%	36.1%	20.7%	12.8%	1.3%	100.0%
PC shortage in computer labs	75	63	47	32	10	227
	33.0%	27.8%	20.7%	14.1%	4.4%	100.0%
Frequent power outages in computer labs	35	44	53	68	27	227
	15.4%	19.4%	23.3%	30.0%	11.9%	100.0%
Mobile internet is cheaper to use	96	48	31	36	16	227
	42.3%	21.1%	13.7%	15.9%	7.0%	100.0%
Book shortage in the library	82	71	37	27	10	227
	36.1%	31.3%	16.3%	11.9%	4.4%	100.0%
It is easier to access services using mobile phone	96	89	27	12	3	227
	42.3%	39.2%	11.9%	5.3%	1.3%	100.0%
Influenced (copied) from a friend	17	24	59	74	53	227
	7.5%	10.6%	26.0%	32.6%	23.3%	100.0%

Average Cronbach's Alpha value of the items in Table 2 was 0.665

Source: Survey data, 2016

Students who did not use mobile phones to access library resources and services were asked to indicate factors that prevented them from doing so. Findings to this query as presented in

Figures 6 show that the small screen size of mobile phone that made reading difficult, high cost of mobile Internet, and library websites that were not mobile friendly were the main reasons.

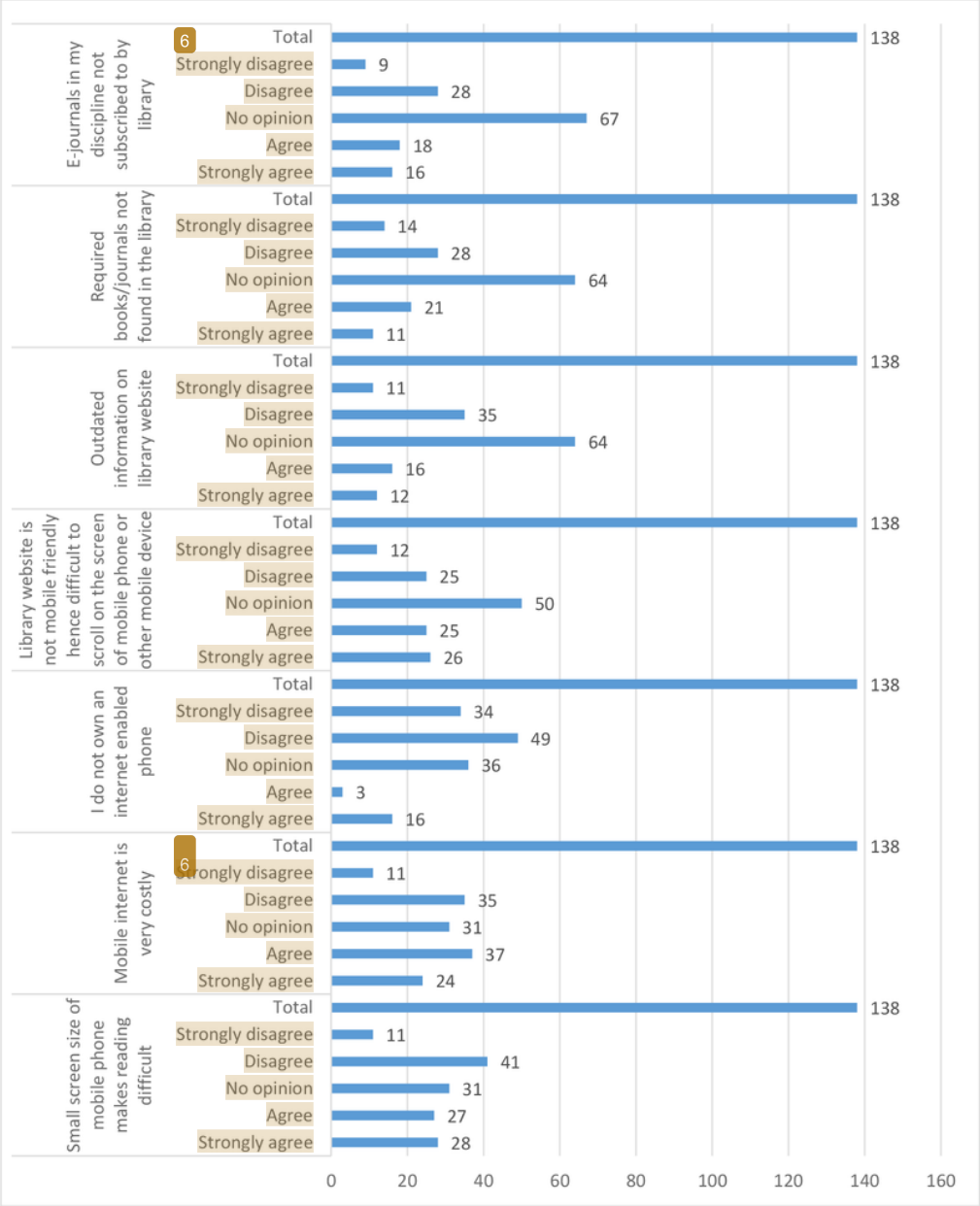

Figure 6: Reasons for not Using Mobile Phones to Access Information Resources by Students (N=138)

Source: Survey data, 2016

The UTAUT model states that behavioural intention to use technology is driven by among others performance expectancy and effort expectancy. Performance expectancy is defined as the degree to which an individual believes that using the system will help him or her to attain gains in a job whilst effort expectancy is defined as the degree of ease associated with the use of the system (Venkatesh et al., 2003). Findings of this study show that students and academic staff chose to access e-books and e-journals using mobile phones over other resources such as laptops because they expected higher performance (mobile internet is more reliable) with minimal effort (mobile internet is available from anywhere, anytime hence more convenient to use; it is easier to access services using mobile phone). Findings of this study further indicated that some of the students did not access e-books and e-journals using mobile phone as a result of influence of a friend. This shows that the construct of social influence did not have an impact on technology use which is similar to what Venkatesh et al. (2003) found in validating the UTAUT model when he found that this construct is only significant in mandatory contexts and becomes nonsignificant in voluntary settings.

Conclusions and future research

In spite of the high prevalence rate of mobile phones 315 (99.7%) and pervasiveness of Internet-capable mobile phones 299 (94.9%) among students, this study concluded that usage of these devices for accessing library resources and services was generally low, falling below the 50% mark in both instances. Notwithstanding this, usage of mobile phones to access e-books, e-journals and the library website was fairly high with close to half of all students reporting to have accessed them. However, usage of mobile phones to access reference services from the library was decimally low with only 60 (20%) students reporting usage. The study did not investigate factors responsible for the disparities in usage observed. However, previous studies have shown that patrons prefer face to face reference compared to help accessible using mobile phones particularly SMS because it lacks sophistication and is also dogged by delays in response times (Murray, 2010; Pearce et al., 2010). Moreover, lack of knowledge to the existence of these resources and services could be another factor.

Similar to what was obtained in previous studies by Vassilakaki et al. (2016) and Lo et al. (2016), technological characteristics of mobile phones (small screen size of mobile phone that made reading difficult and library websites that were not mobile friendly) and high cost of access to mobile phone services have also been highlighted as factors that could negatively impact usage of mobile phone for accessing library services. A study conducted by Research

ICT Solutions (2015), while acknowledging that call costs had reduced over the years, still concluded that call tariffs were still higher in Malawi when compared to neighbouring countries. This shows that the respondents' observation on cost could be valid. Additionally, concerns related to the small screen size of mobile phone are equally valid as the market is awash with such type of mobile phone models. However, such issues could be resolved over time as mobile phones become bigger. Likewise, the pervasiveness of smartphones and increased access of library websites through the mobile web would compel institutions to design mobile-friendly websites. Besides, the study identified other factors that positively impacted use of mobile phones to access library resources and services. The ease of accessing services using mobile phone, and reliability of mobile Internet were identified as factors. Lack of PCs in the computer laboratories and frequent power blackouts that impacted usage of computers in the laboratories were also indicated as factors that positively impacted respondents' use of mobile phones to access resources such as e-books and e-journals.

The overall conclusion of this study is that technological aspects associated with the mobile phone and cost are the main factors impacting usage of mobile phone to access library resources and services. However, the study failed to reach a definite conclusion on the factors responsible for the disparities in usage of mobile phone for library purposes and social functions. Nevertheless, it is assumed that lack of knowledge on the existence of the library services and resources, and how students value them coupled with the possibility of accessing these resources and services through alternative means such as computer laboratories could explain this phenomenon. Since the impact of these factors on usage of mobile phones have not been explored, future research should focus on this area.

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