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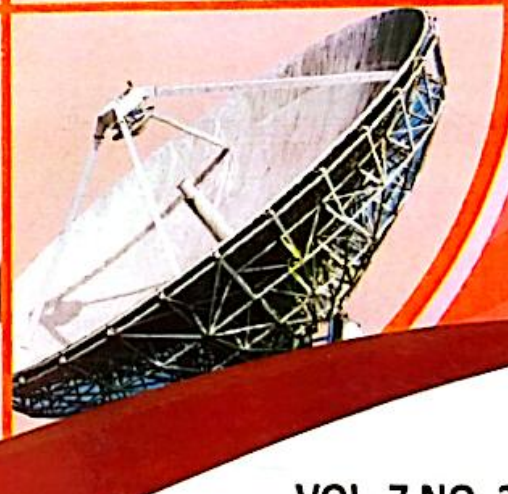

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Adoption and Use of Smart Mobile Devices for Academic Activities by Undergraduates in University of Ilorin Library, Nigeria

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Abstract

This study examined the adoption and use of smart mobile devices for academic activities by undergraduates in the two selected faculties of Communication & Information Sciences and Social Sciences in University of Ilorin, Nigeria. Survey method was adopted for the study. The study adopted the stratified sampling technique. Respondents consisted of undergraduates who were randomly selected by the researchers. Instrument for data collection was questionnaire tagged Adoption and Use of Smart Mobile Devices for Academic Activities Questionnaire (AUSMDAAQ). The data collected was analyzed using descriptive statistics. The findings of the study revealed that undergraduates used various smart mobile devices such as laptop, tablets, smartphones, e-readers, PDA to enhance learning activities. The study further revealed that students adopted and used smartphone devices at a very high level for assignments submission and other academic activities like searching online information watching academic video and digital skills acquisition. In addition, among the benefits of smart mobile applications are enhancement of learning and facilitation of access to online information. Furthermore, the study revealed that insufficient power supply, slow internet connectivity and low storage capacity of the smart mobile phone are problems associated with smart mobile devices. The study therefore, recommended that the university should provide solar energy and power generating plant to complement the existing power supply and upgrading of the internet bandwidth.

Keywords: Adoption, Use, Smart Mobile Devices, Internet, University of Ilorin, Nigeria

1. Introduction

Library services worldwide have changed with the transformations in Information and Communication Technologies (ICTs) particularly academic libraries and their services have been influenced in several ways due to the transformations in ICTs. These transformations have constantly challenged academic librarians in terms of services, roles, responsibilities, skills and competencies. For instance, the concepts of electronic libraries and web-based applications

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have facilitated ubiquitous library services by librarians in making resources and services available to library users without barriers (Emezie & Nwaohiri, 2013). The library services could be accessed using smart mobile devices.

With smart mobile devices and applications, vast amount of changes are generated in communication and transmission of information from business to business and business to customers (Akinbode, 2016). Mobile technology has made communication and information access very convenient and timely to users from the comfort of their homes and offices, using cellular phone units or Personal Digital Assistants PDAs (Aharony 2013; Batool & Asghar, 2012). Many substantial statistics evidence showed that people everywhere interact with information and adopt ICTs (Saxena & Yadav, 2013). Adoption is the process of accepting a new thing that has not been use before. The process of adopting mobile applications that has advanced capabilities such as Internet access, ability to download and install the applications for the use seems to be cumbersome. Adoption of ICTs does not translate to use. Use can be defined as the process of applying ICT being introduced and by enjoying the benefit of it and not with the intention of doing without it. Among the products of ICTS is smartphone. Smart mobiles are used to retrieve information and involve in several activities via online internet access through social media. Mobile device is a general term for any handheld computer or smartphone. Examples of smart mobile devices are laptop computer, palmtop, Personal Digital Assistant (PDA) computer, cellphone, pocket PC, tablet computer, smartphone, e-reader, Bluetooth headset, smart watch and handheld gaming. This mobile device can be used to access information for the benefit of society and other organizations like library. Libraries saddle with provision of access to information and social institution is not excluded in connecting people with information. Libraries are increasingly no longer just physical places but provide library services in various formats (print and non-print). With the recent development in ICTs, information seekers own smart mobiles which serve as eye-opener for libraries to take advantage of mobile technology to improve their library services. Librarians' efforts must be commensurate with this trend and integrate themselves into the mobile realm if they wish to deliver enhanced user services (Saxena & Yadav, 2013). Nowadays, students used smartphones more for communication activities than learning activities. There are various applications related to educational activities that smart phone could be used such as Google Mobile, Facebook, e-mail, Twitter, YouTube and Wikipedia Mobile. Students perceived most apps to be easy to use and useful to them. The recent developments have indicated that smartphone could be used for completing class assignments, checking materials related to courses and accessing library services (Mwabungulu & Mungwabi, 2017).

Furthermore, Mobile devices offer tremendous flexibility for those who want to take advantage of library services. With a simple 3G connection, a user lying on a beach can access e- books and multimedia content from a local library. Smart mobiles can access networks and content can be continually streamed over a network, providing content on demand and making it unnecessary to maintain a paper copy of the material (Saxena & Yadav, 2013). It could be

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established that mobile technology has now come up with "Libraries in hand" as a new trend. With the mobile devices, library users are able to access information from the remote source within very short time. Nowadays many college and university libraries have digital collection made available through digital library using mobile devices like smart phones. With the present age of ICTs, the academic libraries are expected to change its services and housekeeping operations for providing access to its collection via smart phone.

Libraries especially academic library have been facing challenges in satisfying their information users' needs that are demanding and dynamic. With the adoption and use of smart phones, it is possible for university researchers and students to locate what they need without going to the library. Kumbhar and Pawar (2014) and Prakash (2015) stressed that mobile phones and e-mail are important tools to facilitate prompt handling and response to the stream of users questions from within and out of the library vicinity.

Several studies (Bomhold, 2013; Burford & Park, 2014; Kumar, 2014; Rhoda & Lee, 2015) examined mobile devices applications by university students in completing their academic activities. However, few studies dealt with the use of smart mobile devices by library users especially in the field of librarianship. Therefore, the study examined the adoption and use of smart mobile devices for academic activities by undergraduates in selected faculties in University of Ilorin Library. The findings of this study would assist the policymakers in policy formulations that will improve the adoption and use of smart phone by students of tertiary institutions. The findings of this study would create more awareness on the benefits of mobile devices and its use to solve problem faced by undergraduates.

1.1 Statement of the Problem

The use of smart mobile devices among undergraduates in tertiary institutions to access information from library for their scholarly activities cannot be over-emphasized. Academic libraries are facing the competition as a result of the seemingly easy-access platform offered by Information Communication Technologies (ICTs) and academic libraries now facing low usage of their traditional services (Arthur, Osei Brafi & Kuranchie 2013). Several studies (Adelabu, Sanusi & Esiri, 2015; Saxena & Yadav, 2013: Batool & Asghar, 2012) examined the adoption and use of smart mobile application by researchers. However, based on the available literature to researchers, it seems none of the study investigates the adoption and use of smart mobile devices for academic activities by undergraduates in the selected faculties in University of Ilorin library. Therefore, this study examined the adoption and use of smart mobile devices for academic activities by undergraduates in University of Ilorin library.

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1.2 Objective of the Study

The main objective of the study is to investigate the adoption and use of smart mobile devices for academic activities by undergraduates in University of Ilorin (Unilorin) library. The specific objectives of the study are to:

1. examine the types of smart mobile devices being adopted by undergraduates to access academic information in Unilorin library;
2. determine the level of adoption and use of smart mobile devices by undergraduates in Unilorin library;
3. ascertain the benefits of smart mobile devices in academic activities by undergraduates of the selected faculties; and
4. identify the problems associated with the use of smart mobile devices by undergraduates in Unilorin library.

2. Literature Review

A mobile device can be any mobile computer or a variety of other electronic devices that have portable functionality. Examples of mobile devices are smartphones, smart watches, tablets, laptop computers, e-readers and handheld gaming supports. Smartphone is one the most popular communication devices in this modern world. It is a mobile phone running on a complete operating system in a manner similar to a traditional computer, which offer advanced computing abilities and connectivity options. These features enable new kinds of mobile services that in turn shape the usage habits of smartphone users (Alfawareh & Jusoh, 2014). The factor that most influences the increase in smart phone usage is the functionality that helps users in their daily life especially business people and university students (Jacob & Isaac, 2008).

As smart phones provide more and more applications for an increasingly a wider range of usage situations, they have become an increasingly integrated part of people's everyday life (Alfawareh & Jusoh, 2014).

Students make use of emails that are enabled on their smartphones for academic activities (Vázquez-Cano, 2012). Woodcock et al. (2012) asserted that students always use their phones more with playing games and other leisure activities than with learning. In support of the assertion, White and Mills (2012) accentuated that students were increasingly adopting smartphones with the focus on personal use rather than education purposes. Among the identified factors which prevent the widespread adoption of smartphone for education activities are physical, technical and psychological limitations (Woodcock et al., 2012).

Contrarily, Barrs (2011) claimed that students demonstrate greater interest to continue self-directed learning using mobile devices when they are provided detailed guidance and explanation on how to use their smartphones appropriately in classroom settings. Upon

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realizing the usefulness of mobile devices in learning, students are open to the possibility of using their smartphones for educational activities (White & Mills, 2012). According to Bae and Kim (2014), the biggest advantage of the use of smart phones in education is that learning can be accomplished anywhere and anytime. It can create an effective learning environment for instructors and students. Compared to other mobile devices, such as tablets and laptop computers, smart phones have the following advantages.

Despite the widespread use of smart phones, little is known about its benefits in accessing library services. Chen and Denovelles (2013) explored, through an online survey, the access and use of these devices, as well as barriers to the insertion of mobile technologies into the academic sphere. The findings also revealed that students needed more access to academic-friendly devices, such as tablets, and additional support to integrate mobile technologies into learning-related activates. Bomhold (2013) reported that students use smart phone apps for more than communication and entertainment, as a significant number of them disclosed using apps to find academic information on academic websites using related search engines. (White & Mills 2012) surveyed 403 Japanese university students regarding their adoption and use of smartphones, especially for language learning purposes. The findings showed that students were increasingly adopting these mobile devices for personal use but were still reluctant to use them for educational activities. The findings of the study revealed that attitudes towards the use of these devices for learning activities have become more positive. Moreover, Uys et al. (2012) assessed the use of smart phone apps, specifically social networking apps, among students at a South African university. The findings showed that students spent an average of five hours per day on their smartphones communicating and interacting with others via Social Network Services (SNSs) and remained online for about 16 hours per day. Students were found to use SNS apps, predominantly for Facebook, Facebook messenger, whatsapp chat and Blackberry Messenger, to update their profiles, chat with friends and look at their friends' profiles and statuses.

Anyanwu et al. (2012) conducted a survey on the potential use of smartphones for research purposes among undergraduate students in two polytechnic libraries in Nigeria. The findings showed that students using the polytechnic libraries were occasionally using their smart phones for research. The findings also revealed that students were pushed to use these mobile devices for various reasons, such as the lack of relevant information sources in libraries, saving time and the cost of travelling to other libraries for research, a low level of satisfaction derived from available resources and the lack of internet facilities in libraries. However, barriers, such as the high cost of downloading some online resources, incompatibility of software/formats of online resources and insecurity of sites which cause damage to phones, were identified as constraints encountered by students when using smart phones. Kaufman (2009) reported that in spite of the negative effects, mobile phone was very effective in education.

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Norries, Hossain and Soloway (2011) in their study of smart phone usage and academic performance demonstrated that students' achievement increase significantly when students use mobile learning devices, including smartphones for learning. In same vein, Norries et al., (2011) also found that students were constantly using the smart phone camera to take pictures of abstract concepts taught in class so that later they could relate them with the concrete ideas. Similarly, Woodcock et al. (2012) in their study the relationship between smart phones use and academic performance investigated that respondents in their research believed that smart phones had allowed them to improve productivity and eventually their learning performance would reap its benefit. Kumar (2011) indicated in their study the relationship between smart phones use and academic performance, that students were downloading online lectures and reading from e-books to improve learning. Another research, by Lepp, Barkley and Karpinski (2015) reported that students who used the cell phone more on a daily basis were likely to have a lower GPA than students who used it less.

Based on various contrary findings on benefits of smartphones by students of tertiary institutions, it is difficult to draw conclusion that smartphones bring negative results on students' academic performance even though they were used for school-related learning activities. Hence, there is a need to do more research on adoption and use of smart mobile devices by tertiary institutions students.

3. Methodology

A descriptive survey design was adopted. This study adopted the stratified sampling technique to select the sample of the study. This technique involves partitioning the population into groups or strata based on a various levels of students being measured. Questionnaire was used for the study because it aids in gathering factual and in-depth information directly from respondents. The collected data was coded and Statistical Package for Social Science (IBM-SPSS) version 21.0 was used to analyzed the questionnaire and obtains results in form of frequency and percentages. The populations considered in the context of this study were the students of Faculty of Communication and Information Sciences (CIS) and Social Sciences of University of Ilorin as shown in Table 1:

Table 1: Population for the study

Faculty/Levels	200 L	400 L	Total Population
CIS_S	450	389	839
Social Sciences	724	1244	1968
Total Population	1174	1633	2807

Source: (Annual Report of University of Ilorin, 2017)

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Taro Yamane (1969) provides a simplified formula to calculate sample sizes. A 95% confidence level and Precision level = 00.5 are assumed. The formula is written as;

$n=N\div (1+Ne^2)$

Where

N= the sample size required.

N= total known population of the study.

e= level of significance = 0.05

1 = unit (a constant)

$n = 2807 / 1 + 2807(0.05)^2$

$n= 2807/ 1 + 2807\times0.0025$

$n= 2807 / 1+ 7.0175$

$n= 2807/ 8.0175$

n= 350 (Sample Size)

4. Data Analysis and Presentation

The socio-demographic characteristics of respondents is shown in Table 2

Table 2: Socio-Demographic Characteristics of Respondents(N=329)

SN	Variables		Frequency	Percentage
1	Gender:	Male	185	56.2
		Female	144	43.8
2	Age (in year):	15 – 20	97	29.5
		21 – 25	205	62.3
		26 – 30	27	8.2
3	Level of Study:	200	149	45.3
		400	180	54.7

Source: Author's Field Survey, 2018

Table 2 showed that 185 (56.2%) of the respondents are male while the female are 144 (43.8%). From the total respondents, 97 (29.5%) are between the age range of 15 – 20 years, 205 (62.3%) are between 21 – 25 years while 27 (8.2%) are between the age range of 26 – 30 years. Also, 149 (45.3%) of the respondents are in 200 level of study while 180 (54.7%) are in 400 level of study.

This implied that, majority of the respondents are male within their early 20s; and they are mostly in 400 level of study.

Research Question 1: What are the types of smart mobile devices being adopted by undergraduates to access academic information in University of Ilorin (Unilorin) library?

Table 3: Types of Smart Mobile Devices (N=329)

(Key: HA –Highly Available; A –Available; NA –Not Available; DK –Don't Know)

SN	Statement	HA	A	NA	DK
1	Laptop Computer	207(62.9)	91 (27.7)	20 (6.1)	11 (3.3)
2	Smartphones	185 (56.2)	115 (35)	24 (7.3)	5 (1.5)
3	Tablet Computers	114(34.6)	114 (34.7)	79 (24)	22 (6.7)
4	Personal Digital Assistant(PDA) computers	181 (55)	106 (32.2)	36 (10.9)	6 (1.8)
5	Palmtops	79 (24)	120 (36.5)	103 (31.3)	27 (8.2)
6	e-readers	161 (48.9)	125 (38)	38 (11.6)	5 (1.5)
7	Cellphone	81 (24.6)	115 (35)	105 (31.9)	28 (8.5)
8	Bluetooth headset	211 (64.1)	81 (24.6)	27 (8.2)	10 (3)
9	Handheld gaming supports	222 (67.5)	84 (25.5)	18 (5.5)	5 (1.5)
10	Pocket PC	124 (37.7)	116 (35.3)	70 (21.3)	19 (5.8)
11	Smart watch	47 (14.3)	55 (16.7)	142 (43.2)	85 (25.8)

Source: Author's Field Survey, 2018

Table 3 showed that 207 (62.9%) of the respondents strongly agreed that laptop computer is highly available, 91 (27.7%) indicated available while 20 (6.1%) showed not available and 11(3.3%) indicated I don't know. About 185 (56.2%) agreed that smartphones are highly available, while 114 (34.6%) and 114(34.7%) indicated highly available and available respectively. 181 (55%) agreed that PDA computer is highly available, 106(32.2%) indicated that it is available while 36(10.9%) said not available while 199 (60.5%) indicated that palmtop computer is highly available and available. It was also deduced from the results that, 161 (48.9%) of the respondents agreed that e-readers are highly available while 103(31.3%) showed not available and 27(8.2%) said they don't know. 196 (59.6%) showed that cellphones are highly available and available; and for Bluetooth headset, 211 (64.1%) agreed that it is highly available and81(24.6%) of the respondents indicated that Bluetooth headset is available. 222(67.1%) agreed that gaming supports is highly available and 84(25.5%) indicated that it is available while 18(5.5%) said it is not available and 5(1.5%) declared that they did not know.

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and 240 (73%) indicated highly available and available of pocket PC. Lastly, 227 (69%) indicated not available and I don't know of smart watch while

The findings revealed that undergraduates used smart mobile application for assignments, online lectures, discussion, and assignments submission, storage of notes and for reading in their disciplines. The findings corroborated Kumar (2011) who reported that students were downloading online lectures and reading from e-books to improve learning. It is obvious that nowadays days, that lecturers, school administrators and educators of tertiary institutions of learning have come to terms with the reality that students use a variety of mobile technology for various academic activities.

Research Question 2: What is the level of adoption and use of smartphone by undergraduates in selected faculties in Unilorin?

Table 4: Level of Adoption and Use of Smartphone (N=329)
(Key: VH –very high; M –moderately; VL –very low; N –never)

SN	Statement	VH	M	VL	N
1	I adopt and use smart mobile devices for assignments	233 (70.9)	84 (25.5)	6 (1.8)	6 (1.8)
2	I adopt and use smart mobile devices for searching online information	83 (25.3)	116 (35.3)	93 (28.3)	37 (11.2)
3	I adopt and use smart mobile devices for project	186 (56.6)	96 (29.2)	25 (7.6)	22 (6.7)
4	I adopt and use smart mobile devices for digital skills	129 (39.1)	145 (44.1)	45 (13.7)	10 (3)
5	I adopt and use smart mobile devices for accessing interface of virtual classroom	193 (58.7)	113 (34.3)	19 (5.8)	4 (1.2)

Source: Author's Field Survey, 2018.

Table 4 showed that, 233 (70.9%) of the respondents adopted and used smart mobile devices at a very high rate for assignments, followed by 84 (25.5%) of the respondents who moderately used it for the same work. About 83 (25.3%) of the respondents adopted and used it at a very high rate for online information and 116 (35.3%) of the respondents adopted and used it at a moderate rate for the same purpose.

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Also, 186 (56.6%) of the respondents adopted and used it at a very high rate for project work, followed by 96 (29.2%) of the respondents who adopted and used it at a moderate and not familiar rate for the same purpose. It was observed of the respondents adopted and used it for digital skills from the table that 129 (39.1%) of the respondents adopted and used it very high for digital skills while 145 (44.1%) moderately used it for the same purpose. Lastly, 193 (58.7%) of the respondents adopted and used it in a very high rate for accessing interface of virtual classroom.

Research Question 3: What are the benefits of smart mobile devices in academic activities by undergraduates in selected faculties in Unilorin?

Table 5: Benefits of Smartphone to the Undergraduates (N=329)
(Key: SA –strongly agree; A –agree; D –disagree; SD –strongly disagree)

SN	Statement	SA	A	D	SD
1	The use of smart mobile devices enhances students learning	249 (75.7)	78 (23.7)	1 (0.3)	1 (0.3)
2	Assignments are frequently done using the smartphone	219 (66.6)	97 (29.5)	6 (1.8)	7 (2.1)
3	Smart mobile devices facilitate student-lecturer online interactions.	172 (52.3)	131 (39.8)	13 (4)	13 (4)
4	Students enjoy smooth access to e-books and online study.	36 (11)	37 (11.2)	81 (24.6)	175 (53.2)
5	smart mobile devices decrease communication gap between students and lecturers	45 (13.7)	49 (14.9)	108 (32.8)	127 (38.6)
6	smart mobile devices make communication easy between students and school managements	156 (47.5)	143 (43.5)	13 (4)	17 (5.2)
8	smart mobile devices are used to access course information regularly	168 (51.1)	141 (42.9)	5 (1.5)	15 (4.6)

Source: Author's Field Survey, 2018.

Table 5 revealed that 249 (75.7%) of the respondents strongly agreed that use of smart mobile devices enhances students learning while 78 (23.7%) agreed. 219 (66.6%) strongly agreed that assignments are frequently done using the smartphone while 97 (29.5%) agreed. The findings corroborate Anyanwu et al. (2012) who reported that students were pushed to use these smart mobile devices for various reasons, such as research and project, the lack of relevant information sources in libraries, saving time and the cost of travelling to other libraries for research. Norries, Hossain and Soloway (2011) accentuated that undergraduates used smart mobile devices to demonstrate that students' achievement increase significantly when students

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use mobile learning devices, including smartphones, during learning time. The result is not at variance with the findings of Woodcock et al. (2012) that undergraduates believed that smart mobile devices had allowed them to improve productivity and eventually their learning performance would reap its benefit.

Research Question 4: What are the problems associated with the adoption and use of smart mobile devices by undergraduates in University of Ilorin (Unilorin) library?

Table 6: Problems Associated with the Use of Smart Mobile Devices by Undergraduates (N=329)

(Key: SA –strongly agree; A –agree; D –disagree; SD –strongly disagree)

SN	Statement	SA	A	D	SD
1	Lack of sufficient power supply for charging	194 (60.5)	115 (35)	9 (2.7)	6 (1.8)
2	Low internet/ connectivity of mobile applications	181 (55.1)	116 (35.3)	18 (5.5)	14 (4.3)
3	Low Storage capacity of smart mobile devices	111 (31.8)	151 (45.9)	36 (10.9)	31 (9.4)
4	Virus attack to smartphones	90 (27.4)	153 (46.5)	44 (13.4)	42 (12.8)
5	Slow connectivity and retrieval of information	124 (37.7)	149 (45.3)	30 (9.1)	26 (7.9)
6	Popping up of irrelevant information during the use of the mobile applications	149 (45.3)	142 (43.2)	15 (4.6)	23 (7)
7	Short battery life span of mobile phones	114 (31.7)	155 (47.1)	45 (13.7)	25 (7.6)

Source: Author's Field Survey, 2018.

Table 6 showed that 194 (60.5%) of the respondents strongly agreed that lack of sufficient power supply is a problem associated with smart mobile devices, 181 (55.1%) of the respondents strongly agreed that low internet connectivity of smart mobile devices is another problem. 111 (31.8%) of the respondents strongly agreed while 151 (45.9%) agreed to the fact that mobile phone storage is another problem associated. Also, 90 (27.4%) of the respondents

that strongly agreed that Virus attack to phones is seen as a problem followed by 153 (46.5%) that agreed. 124 (37.7%), 149 (45.3%) and 114 (31.7%) of the respondents strongly agreed that connectivity and retrieval of information, popping up of irrelevant information during the use of the smart mobile devices and short life-span of battery respectively are problems associated with the use of smart mobile devices for students.

5. Conclusion

The emergence of Information and Communication Technology (ICT) has brought a paradigm shift for academic activities. Smart mobile device being a product of ICTs has enhanced user's access to information. From all available evidence, it is obvious that the undergraduates adopt and use smart mobile devices for academic activities in University of Ilorin.

6. Recommendations

Based on the findings of the study, the following recommendations are made:

1. Institutions should encourage the use and adoption of smart mobile devices for academic purposes.
2. Mobile app developers should develop free educational mobile devices that will be readily available for students' use.
3. Students should be guided and counseled on the use of smart mobile devices at the point of entry for their academic programme on the campus. This would require the services of the university Guidance and Counseling Unit.
4. Hardware manufacturers should produce devices that have long battery life span to encourage more use of smart mobile devices; to overcome power challenge.
5. Provision of adequate funds by the institution management to ensure constant subscriptions to broadband Internet connectivity, electronic scholarly databases and web applications

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