The Impact of Smart-phones Usage on Third-Year Undergraduates in Tanzania: A Case of the University of Dar es Salaam

Elias Mwabungulu
eliasmwabungulu@yahoo.com
&
Hosea Mungwabi
mungwabihosea@yahoo.com

Abstract

This study investigated the impact of the use of smart-mobile phone by undergraduate students at the University of Dar es Salaam. Specifically, the study sought to establish the academic-related purposes for which university students use smart-phones and the impact of such usage on their academic life. To achieve these objectives, the study employed a mixed methods research approach in which questionnaires and an interview guide were used to collect data from a sample size of 166 students. The results of the study revealed that the majority of undergraduate students own smart-phones which they used for different purposes, including for academic intentions such as reading lecture materials, and watching academic-related videos. The study findings also reveal that smart-phones to an extent enhance the undergraduate students' performance of academic activities.

Introduction

Technologies continue to influence education through innovations that enhance teaching and learning. Al-Ammary (2006), Keshwani, Bernejee and Patni (2008) affirm that information and communication technologies have enhanced interactive learning experiences by providing communication mechanisms which promote teaming, collaboration, and interpersonal skills development. Recently, communication technologies have included smart-phones. Mobile phones such as smart-phones have demonstrated more value to education than just the sending of administrative information to students (Ferry, 2008). With their increasing computing power, they now present a great avenue for engaging learners on and off school or college campuses. In fact, they provide students with a great opportunity of extending their access to academic content beyond the walls or corridors of campuses of their universities or colleges and libraries in

particular. On the whole, a lot of education-related apps are being developed , hence giving smart-phones the ability to retrieve and open nearly all the formats of information via Wi-Fi networks and mobile internet (Lardinois, 2012; Ensley & Kaskosz, 2013). One would expect that owning a smart-phone is a major step towards having knowledge and education resources at one's fingertips. Surprisingly, Sarwar and Soomro (2013) observed that smart-phones usage by students have had negative effects on their academic performance. These include spending a lot of time on their smart-phones for non-academic purposes. It was however not clear whether these findings apply to Tanzania as well, especially considering that most of the students enrolled in Tanzanian universities are matured as they are aged above eighteen (18). These are sensible enough to plan when to use and not to use smart-phones. Since it was obvious that there might be some negative and positive effects of using smart-phones, the question was between these two, what outweighed the other from a student's perspective? It was against this background that this study was undertaken with view to investigating the impact and purposes for which undergraduate students at the University of Dar es Salaam deploy smart-phones.

Literature review

The exploration of the role smart-phones play in American lives revealed that they are used in many activities, including watching news from media outlets, accessing health information, and finding jobs (Pew Research Centre, 2015). Generally, there was an Internet-dependent syndrome, hence confirming the findings from studies by Ericson (2013) and Informa Telecoms and Media (2012) which had maintained that people mostly used their smart-phones to access Internet-based services.

West (2013) noted that the always on and always connected mobile devices in the hands of students have the potential of dramatically improving educational outcomes as they offer them easy access to digital information. One of the main roles of smart-phones in education is to facilitate access to information as the We Are Social (2014) study revealed: smart-phone owners use them to search for information on the Internet. A BBC (2012) article shows that in 2012 Amazon sold more electronic than print books and that the e-books purchases were made through a mobile app called Kindle, which indicates that, there was a shift in reading behaviour. Studies by Taylor (2013) and Voxburner (2013) also found that the majority of e-book readers preferred smart-phones as reading platforms. Furthermore, Voxburner (2013) also reported that young people aged between 16 and 24 preferred reading e-books on smart-phones than other ages; moreover, they used them for a variety of academic activities. Similarly, Manea (2012) noted that students use their smart-phone apps in a variety of educational activities such as taking classroom notes, writing papers, using calendars to keep track of their work, solving mathematical problems, and staying in touch with classmates. With smart-phones, students have the freedom to perform their tasks anywhere and at their own leisure. Buck, McInnis, and Randolph (2013) point out that educational apps assist students in accessing interfaces of virtual classrooms, researching specific subject matter, and studying flash-card notes while in distant locations. On the other hand, the numerous academic benefits of smart-phones come with negative impacts as other studies have revealed.

Lee *et al.* (2014) found that students with smart-phones are prone to spending too much time using them for purposes such as communication hence disrupting their personal and social activities, inclusive of education. Sarwar and Soomro (2013) reported that smart-phones distract

classes, promote cheating, and increase bullying between students through the Internet, which may affect the victims' focus in their studies.

In terms of students' interest in using smart-phones in academic activities, Paterson and Low (2011) reveal that Edinburgh University students were interested in using their smart-phones to access library services such as maps of the library's floors and locations of facilities such as shelves. Milrad and Spikol (2007) at Växjö University and Blekinge Institute of Technology in Sweden found that students were ready to receive and send educational content to and from their course instructors and perform some academic tasks on their smart-phones if supported by their parent institutions.

Methodology

This study was conducted at the University of Dar es Salaam (UDSM) main campus because it is the biggest university in Tanzania and is located in the biggest city, where technology availability, diversity and usage was comparatively higher than other similar institutions located remote regions. Indeed, the strategic location of the UDSM made it ideal for this study. Like with other technologies, the study worked on the assumption that smart-phones usage was more advanced in Dar es Salaam than in other regions of Tanzania Mainland as the city is the commercial hub of the nation. Thus, researchers found that the topic fitted well in the area and their familiarity with the study area eased the task of data collection for this study. The study targeted population that was consisted of undergraduate students in the University of Dar es Salaam as most of them are slightly above teenage. The University of Dar es Salaam has constituent colleges such as the Dar es Salaam University College of Education (DUCE), the Mkwawa College of Education (MUCE). In addition, it has off-main campus units such as the

School of Journalism and Mass Communication (SJMC), and the Institute of Marine Sciences (IMS) in Zanzibar. However, these were left out in this study due to time and financial constraints. Also, the University of Dar es Salaam has a variety of other categories of people including academic and support staff as well as postgraduate students. These were deemed ineligible for this research owing to the nature of study, which targeted youngsters to establish whether findings on smart-phones usage by students found elsewhere also applied to Tanzania. Furthermore, Research Centre (2013) and Nielsen (2013) have revealed that teenagers and people in the early and mid-20s are the major users of smart-phones. Considering this evidence, researchers decided to use undergraduate students because their ages are most similar to those associated with high smart-phone ownership, hence making them information-rich on this topic.

The study employed a mixed methods approach to obtain both quantitative and qualitative data. To ensure representation, questionnaires were distributed to 182 students randomly selected from various university schools and colleges such as College of Arts and Social Sciences (CoSS), Business School (UDBS), School of Education (SoED), College of Engineering and Technology (CoET), College of Natural and Applied Sciences (CoNAS), College of Information and Communication Technologies (CoICT) and the University of Dar es Salaam's School of Law (UDSoL). An interview guide was also used to collect data from 15 students who said they had no time to fill in questionnaires.

Data presentation, analysis and discussion of research findings

From the 182 respondents who were served with questionnaires, 166 completed and returned them, hence representing a response rate of 91 percent. In terms of gender, 87 (52%) of the

respondents of this study were male whereas 79 (48%) were female. However, this proximity does not mean that the number of female and male students is almost the same. This happened because a few students were drawn from each programme in each field of study. The respondents' ages ranged from 19 to 39 years with the majority (93%) aged between 19 and 29 years whereas only 17 (10%) were of aged between 30 and 39 years.

Table 1: Composition of respondents by their Colleges of Study

Sequential number	**College of Study**	**Number of Students**	**Percentage Rank**
1	College of Natural and Applied Sciences	53	32
2	College of Arts and Social Sciences	40	24
3	Business School	33	20
4	Information and Communication	16	10
5	College of Education	13	09
6	School of Law	11	07
TOTAL		166	100

Source: Field Data (2015)

Table 1 shows that 53(32%) of the respondents were from the College of Natural and Applied Sciences (CoNAS), 40 (24%) of the respondents were from the College of Arts and Social Science (CoSS) 33(20%) of the respondents were from Business School (UDBS), 16(10%) of the respondents were from College of Information and Communication Technologies (CoICT) and 13(09%) were from the College of Education (UDSoL) whereas 11(07%) of the respondents were from the University of Dar es Salaam School of Law (UDSoL). The number of the

respondents was determined by the number of the programmes in the College. From Table 1 above it is evident that all colleges were well represented in this study.

Types of Mobile Phones Used by Students

Table 2: Types of Mobile Phones Used by Students

Sample Size	Category	Frequency	Percentage
N=166	Feature Phone	33	20
	Smartphone	122	73
	Tablet	11	07
	None	0	0
Total		**146**	**100**

Source: Field Data (2015)

Table 2 shows that the majority 122 (73%) of the respondents had smart-phones, 33 (20%) of them had feature phones, and 11(07%) had tablets mobile phones. None of the students had no mobile phone. In addition, the wide availability of smart-phones, the presence of tablets among the students increases the availability of high-end communication devices. Furthermore, the study also found that out of 33 students who had feature phones, 23 (69%) of them had previous experiences of using smart-phones whereas only nine (27%) of them had never used a smart-phone in their lives.

These results seem to confirm the association between age and ownership of smart-phones reported in the literature available considering that the majority of the undergraduate students at the University of Dar es Salaam are aged between 19 and 29 years. Deloitte (2014) observed that 80 percent of respondents aged between 18 and 24 years had smart-phones as compared to 75 percent of the respondents aged between 25 and 34 years. This shows that the level of smart-phone ownership decreases with advancing years.

General uses of mobile phones

The most popular general purpose for using mobile phones by undergraduate students are: making voice calls as mentioned by 121 (83%) respondents; sending regular text messages which was indicated by 120 (82%) respondents; social networking as reported by 114 (78%) respondents, internet browsing as mentioned by 107 (73%) respondents; taking photographs as reported by 92 (63%) respondents; playing music as mentioned by 82 (56%) respondents; emailing as mentioned by 74 (51%) respondents; and storing files as confirmed by 67 (46%) respondents. These results show that undergraduate students at the University of Dar es Salaam use their smart-phones primarily for communication purposes, internet access, access to media, and productivity.

Usage of smart-phones in academic activities

One hundred and nine (122) respondents were further asked whether they used smart-phones for academic purposes or not. Figure 1 presents the results:

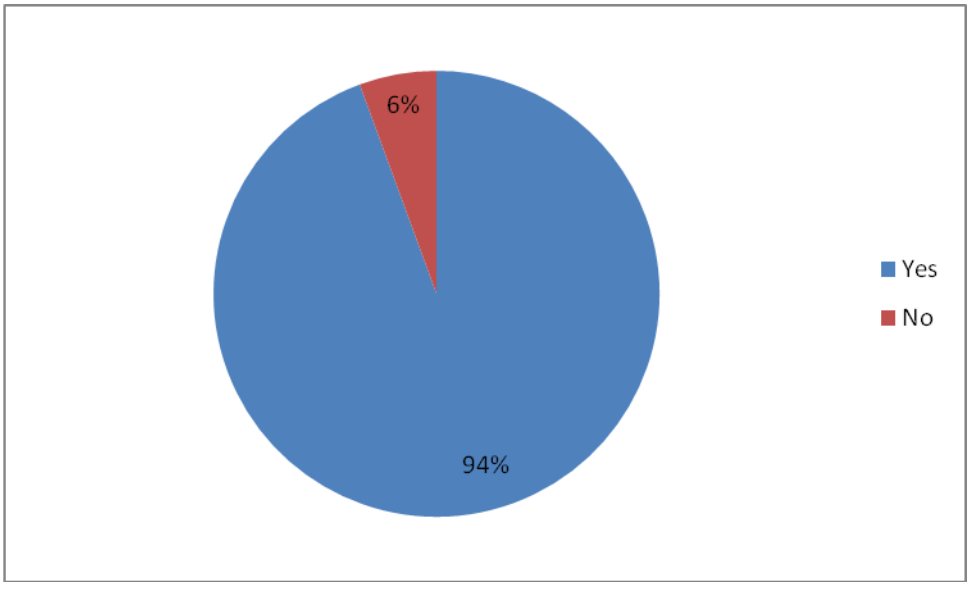

Figure 1: Smart-phones usage for Academic Purposes (N=122)

Source: Field Data (2015)

As Figure 1 illustrates 94 percent of the respondents indicated that they use smart-phones for academic purposes whereas six percent said they did not. The high usage of these devices for academic activities indicates that students were aware of the different strengths of smart-phones and the potential positive effect they could bring to education. Similarly, Reese's (2013) study revealed that the majority of undergraduate students at the University of Southern in the US were using their smart-phones to find information for academic activities.

Respondents, who had smart-phones, were also asked to outline purposes for which they use them. Figure 2 summarises their results:

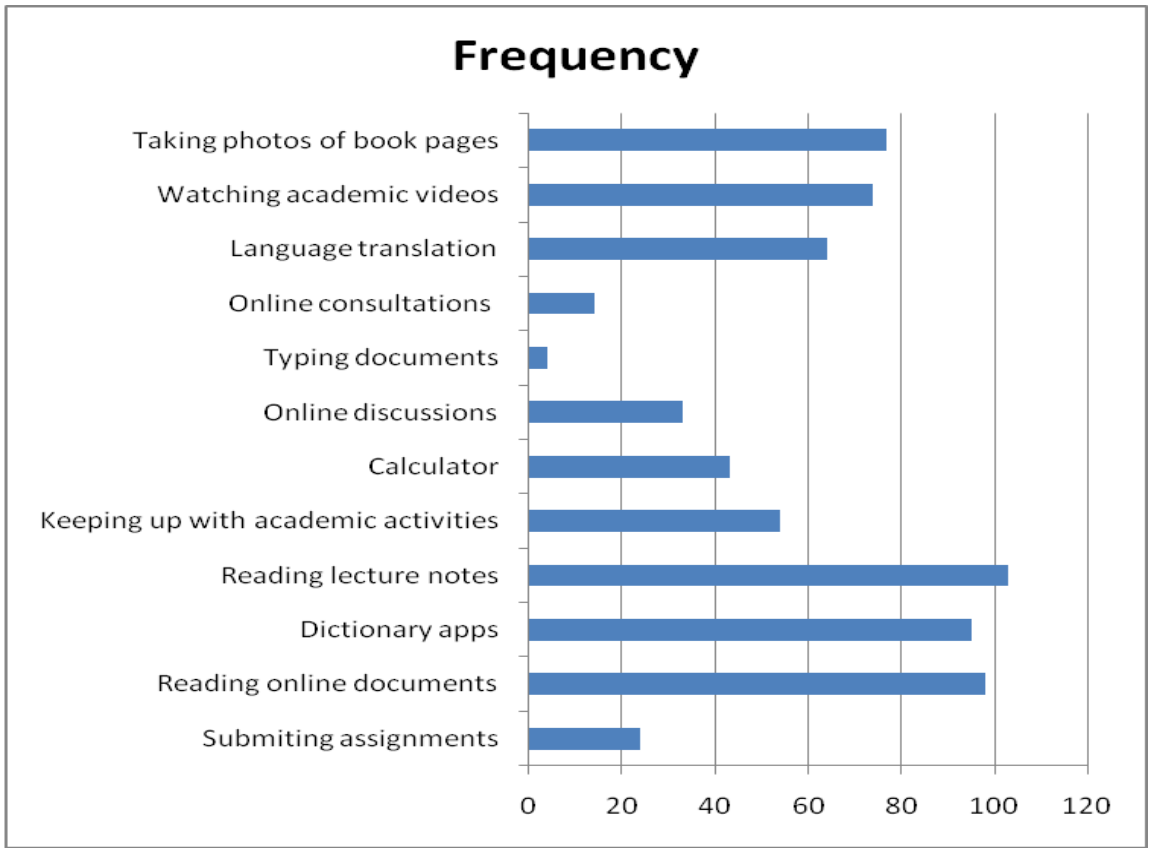

Figure 2: Academic Uses of Smart-phones (N=122)

Source: Field Data (2015)

Figure 2 shows that, the majority (84%) of respondents said they use smart-phones for reading lecture notes, 80 percent mentioned searching for and reading online documents, 78 percent said they use them to access dictionary apps whereas 63 percent use them to take photos of book pages and other types of documents. In addition, 61 percent of the respondents said they watch academic videos on them, 53 percent, mostly science students, cited language translation, 44 percent use them to keep up with university events, 35 percent said they use them as calculators whereas 27 percent mentioned discussing academic issues online. Furthermore, 20 percent of the respondents said they use smart-phones to send assignments to their instructors, 12 percent use them for online consultations with course instructors, whereas a mere three percent of the respondents indicated that they use them for typing documents.

The study results show that there was a wide range of academic activities in which smart-phones are used. The results share similarities with those from a study by Alfawareh and Jusoh (2014) which revealed various uses of smart-phones in academic activities, which included taking notes in class, recording lectures, and accessing online information. The study also indicated that smart-phones are used for collaborative learning, problem-solving, use of multimedia academic content, and for reference services. The results also reveal that online documents reading is the activity frequently performed using smart-phones as revealed by 80 percent of the respondents followed by reading lecture notes mentioned by 72 percent of the respondents, watching academic videos mentioned by 53 percent of the respondents, taking photos of pages from books

and other documents mentioned by 51 percent, and finally accessing dictionary apps as mentioned by 49 percent of the respondents.

These findings show that, although majority of undergraduate students admitted to use smart-phones in their academic activities, the frequency of usage is low save for few academic activities. This constitutes an under-utilisation of tools Woodcock *et al*. (2012) found to have a very high computing capacity capable of allowing users to perform any academic task which in the past would require a desktop or laptop computer.

Appropriateness of smart-phones for performing academic activities

On the appropriateness of smart-phones for academic purposes, the respondents rated them as indicated in Figure 3:

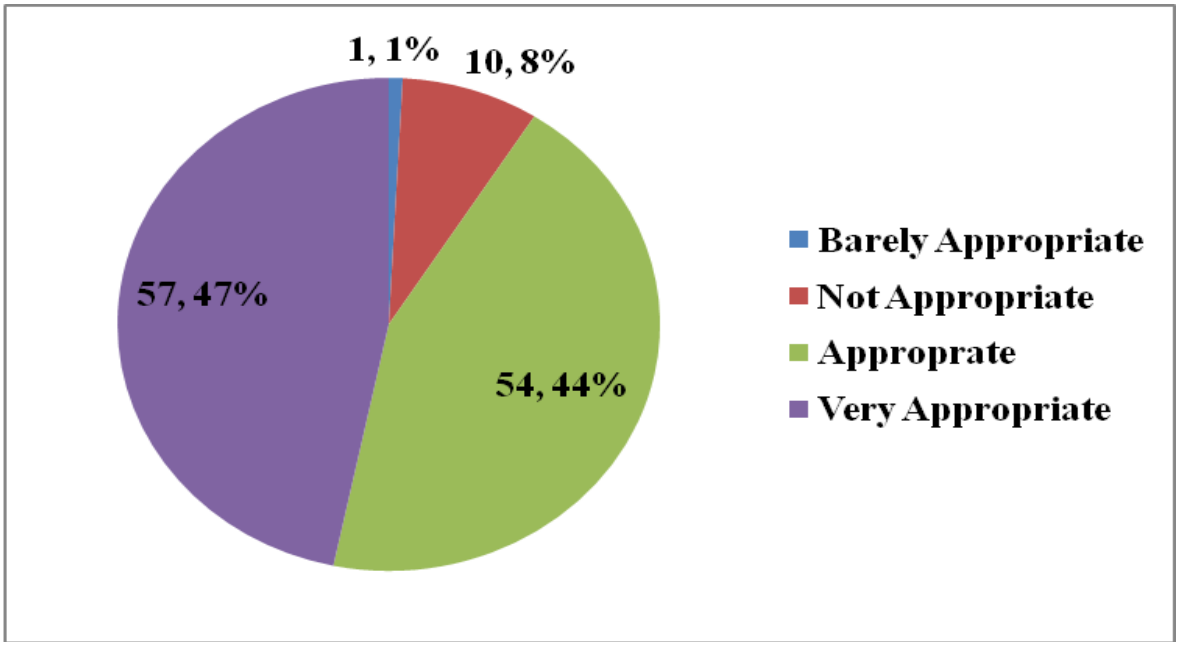

Figure 3: Appropriateness of Smart-phones for Academic Activities (N = 122)

Source: Field Data (2015)

The results in Figure 3 show that 47 percent of the respondents said their smart-phones were very appropriate for performing academic activities, 44 percent said they their smart-phones were appropriate, eight percent found them barely appropriate, whereas a mere one percent said smart-phones were not appropriate for academic purposes.

These results indicate that the majority of the respondents consider smart-phones useful for their academic activities. This can be attributed to their increasing capabilities in handling complex tasks, ease of operating them, provision of easy access to information on internet, good screen quality when reading and watching videos, and speed of executing commands. Of these, ease of operating smart-phones appeared to be the most common reason for perceiving smart-phones to be useful as one interviewee put it: "It is basically a phone hence very easy to operate and doesn't require a lot of training like computers".

Rung *et al*. (2014) also observed that the simplicity of smart-phones make them very valuable to students.

Respondents also expressed the extent to which they thought smart-phones enhance the performance of the various academic activities they use them for. Figure 4 shows the responses:

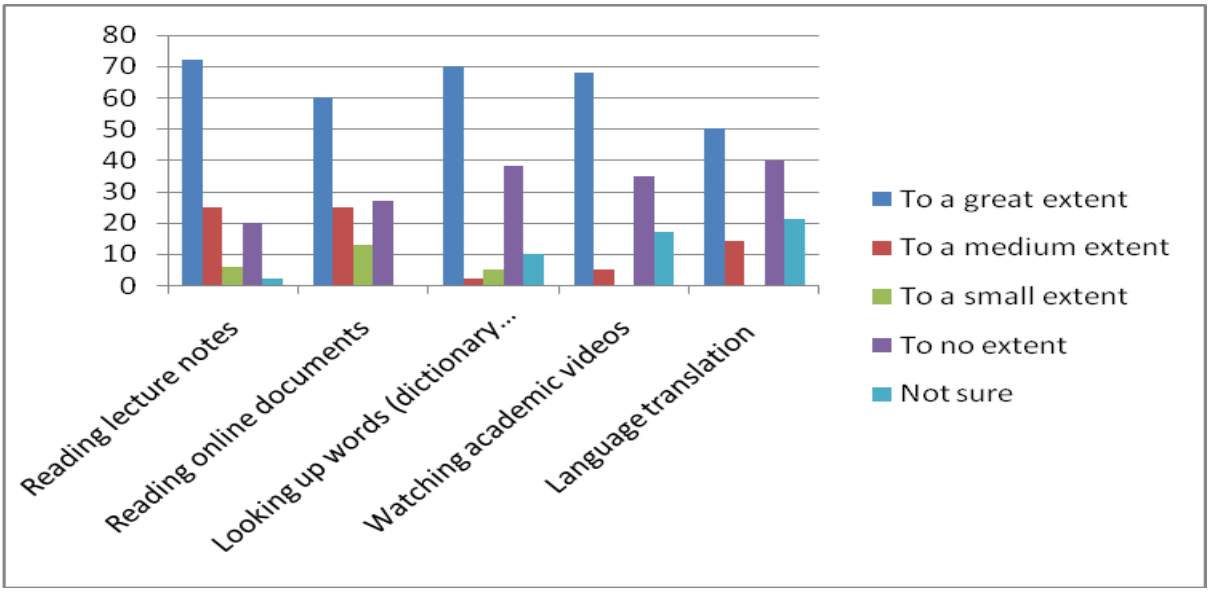

Figure 4: Extent to which Smart-phones Enhance Performance of Academic Activities (N=122)

Source: Field Data (2015)

Figure 4 indicates that respondents found smart-phones to enhance to a great extent the performance of the following academic activities: reading of electronic lecture notes as revealed by 59 percent of the respondents; reading of online documents as mentioned by 49 percent of the respondents; looking up words as indicated by 57 percent of the respondents; watching academic videos as indicated by 56 percent of the respondents; and language translation as revealed by 41 percent of the respondents. The other respondents rated the contribution of smart-phones in the performance of academic activities as of medium extent, small extent, and no extent whereas others were not sure as presented by Figure 4. These results indicate that students found smart-phones to have a big positive impact on their performance of academic activities considering that the majority of them found the devices to enhance each activity to some extent as compared to those who did not rate them that way. These findings are in direct contrast with the results of a

study by Kibona and Mgaya (2015) who found smart-phones to have a negative impact on academic performance of students.

Non-academic uses smart-phones

Respondents were also asked to choose from a checklist provided what they considered to be negative effects of smart-phones usage. Table 3 below summarises their responses:

Table 3: Non-academic Usage of Smart-phones

S/N	CATEGORY	FREQUENCY	PERCENTAGE	RANK
1	Communication	122	100	1
2	Browsing on social forums	103	84	2
3	Browsing online local newspapers	80	66	3
4	Listening to music	50	41	4
5	Watching video	44	36	5
5	Browsing pornographic pictures or films	30	26	6
6	Listening politicians' speeches	10	08%	7

Source: Field Data (2015)

Table 3 shows that all the 122(100%) respondents who had smart-phones cited communication, 103(84%) cited browsing on social forums, 80(66%) cited browsing online newspapers, and 50(41%) indicated listening to music. Others 44(36%) of the respondents said they use smart-phones to watch videos, 30(26%) of the respondents said they use smart-phones for browsing

pornographic pictures or films and 10(08) of the respondents said they use them for listening to politicians' speeches. Respondents did not consider non-academic usage of smart-phones to have negative impact in their academic life. Instead, they said they use them to refresh their minds especially after being exhausted due to frequent lectures. Also, they did not consider disruption of classes and class distraction as negative effects as one respondent put it: "I switch my smart-phone off during classes and switch it on after classes". Other respondents 78(64%) said their lecturers ask them to switch their smart-phones off upon entering in the class. Another 49 (40%) of the respondents said they keep them in silent mode when they are in class and make calls after classes. Finally, all the 122(100%) of the respondents reported that the advantages of smart-phones outweigh disadvantages if any. They attributed this aspect to their maturity and ability to control themselves.

Conclusion

This study has revealed that majority of the undergraduate students own smart-phones and use them in their academic activities. This high level of smart-phones acceptance among students and their willingness to use them in their academic activities makes it apparent that the university has an opportunity awaiting exploitation. The opportunity requires the university to come up with initiatives to maximise academic usage of smart-phones considering that students are satisfied with their ability to perform academic activities. Part of the initiatives would require the university to start considering smart-phone owners in planning academic activities since these devices have proven to be good academic tools.

Recommendations

With smart-phones being synonymous with social networking, the high level of availability of these devices at the University of Dar es Salaam provides the university library with an opportunity to reshape its reference services. Social networks provide a better and convenient platform for a library to reach out to its users with much ease. It is, therefore, recommended that the library takes advantage of this opportunity. As the university library is in the process of developing a digital collection, it would be advisable to ensure that mobile devices such as smart-phones are part of the plans. Results of this study have revealed that undergraduate students read their lecture materials and online documents on their smart-phones. This means that suggesting that students would also love to access the library's digital collection via these tools would not be a far-fetched assumption.

The university needs to consider smart-phone users during academic content development. The results of this study revealed a high rate of academic usage of smart-phones which makes it necessary for the university academic content developers to create content that is compatible with most smart-phone operating systems. Most of the services the university may offer to students through their smart-phones are Internet reliant. It is thus recommendable that the university expands it wireless internet coverage to allow students to fully utilise their devices for learning and receiving university services even when in their hostels. Despite the presence of numerous academic apps available for download it is recommended that University of Dar es Salaam through its Information Technology Department should develop university apps. Such

apps should be tailor-made for the needs of students of this university and host content that caters for the academic demands of the university.

References

Al-Ammary, J. (2006). Educational technology: A way to enhance student achievement at the University Of Bahrain. Retrieved on Friday, 19th September 2014 from: http://www.tojned.net/pdf/v03i03/v03i03-06.pdf

Alfawareh, M. and Jusoh, S. (2014). Smartphones usage among university students: Najran University case. Retrieved on Friday, 5th September 2014 from: http://www.researchgate.net/profile/Shaidah_Jusoh/publication/261874520_SMARTPHONES_USAGE_AMONG_UNIVERSITY_STUDENTS_NAJRAN_UNIVERSITY_CASE/links/0a85e535cc714eb93a000000?origin=publication_detail

BBC (2014).CES 2014: Android device sales 'to top one billion' in 2014. Retrieved on Friday, 19th September 2014 from: http://www.bbc.com/news/technology-25632430

Buck, J. L. McInnis, E. & Randolph, C. (2013). The new frontier of education: the impact of smartphone technology in the classroom. Retrieved on Friday, 5th September 2014 from: http://se.asee.org/proceedings/ASEE2013/Papers2013/177.PDF

Deloitte (2014). Global mobile survey 2014: The pulse of the mobile nation (The Dutch Perspective). Retrieved on Friday, 19th September 2014 from: http://www2.deloitte.com/content/dam/Deloitte/nl/Documents/technology-media-telecommunications/deloitte-nl-tmt-global-mobile-consumer-survey-2014.pdf

ECAR (2014). Undergraduate students and IT. Retrieved on Monday 8th June 8, 2015 from: http://www.csus.edu/irt/cio/strategicplanning/Documents/Undergrad-Students-and-IT-2014-Full-Report.pdf

Ensley, D. & Kaskosz, B. (2013). Mobile math apps: Innovative smartphone technology. Retrieved on Friday, 19th September 2014 from: http://archives.math.utk.edu/ICTCM/VOL25/S064/paper.pdf

Ericson (2013). Smartphone usage experience: The importance of network quality and its impact on user satisfaction. Retrieved on Saturday, 13th October 2014 from: http://www.ericsson.com/res/docs/2013/consumerlab/smartphone-usage-experience-report.pdf

Ferry, B. (2008).Using mobile phones to augment teacher learning in environmental education. Retrieved on Sunday, 12th October 2014 from: http://ro.uow.edu.au/cgi/viewcontent.cgi?article=2543&context=edupapers

Informa Telecoms and Media (2012). Understanding today's smartphone user: Demystifying data usage trends on cellular & Wi-Fi networks. Retrieved on Saturday, 18th October 2014 from: http://www.informatandm.com/wp-content/uploads/2012/02/Mobidia_final.pdf

Keshwani, B., Barnejee, C., & Patni, P. (2008). Role of technology in education: A 21st

century approach. Retrieved on Monday, 13th October 2014 from: http://www.academia.edu/4514260/Role_Of_Technology_In_Education_A_21st_Century_Approach

Kibona, L. and Mgaya, G. (2015). Smartphones' effects on academic performance of higher learning students: A case of Ruaha Catholic University- Iringa Tanzania. *Journal of Multidisciplinary Engineering Science and Technology, 2 (4), 777 – 784.* Retrieved on Friday, 23 October 2015 from: http://www.jmest.org/wp-content/uploads/JMESTN42350643.pdf

Lardinois, F. (2012). Forrester: 84% of US adults now use the web daily, 50% own smartphones, tablet ownership doubled to 19% In 2012. Retrieved on Monday, 13th October 2014 from: http://techcrunch.com/2012/12/19/forrester-84-of-u-s-adults-now-use-the-web-daily-50-own-smartphones-tablet-ownership-doubled-to-19-in-2012/

Lee, U., Lee, J., Ko, M., Lee, C., Kim, Y., Yang, S., Yatani, K., Gweon, G., Chung, G., & Song, J. (2014). Hooked on smartphones: An exploratory study on smartphone overuse among college students. Retrieved on Tuesday, 14th October 2014 from:http://www.yatani.jp/paper/CHI2014_MobileOveruse.pdf

Manea, N. (2012). There's an app for that: Using smartphones in education. *Society*, 10 (4), 62-70. Retrieved on Tuesday, 14th October 2014 from:http://www.unm.edu/~tlc/AppsInEduc.pdf

Milrad, M. & Spikol, D. (2007). Anytime, anywhere learning supported by smart phones: Experiences and results from the MUSIS Project. *Educational Technology & Society*, *10* (4), 62-70. Retrieved on Monday, 6th October 2014 from:http://www.ifets.info/journals/10_4/7.pdf

Paterson, L. & Low, B. (2011). Student attitudes towards mobile library services for smartphones. *Library Hi Tech*, *29*(3), 412 – 423. Retrieved on Monday 8th June 8, 2015 from: http://www.emeraldinsight.com/doi/full/10.1108/07378831111174387

Pew Research Center (2015). US smartphone use 2015. Retrieved on Friday, 15th May 2015from:http://www.pewinternet.org/files/2015/03/PI_Smartphones_0401151.pdf

Rung, A., Warnke, F., & Mattheos, N. (2014).Investigating the use of smartphones for learning purposes by Australian dental students. Retrieved on Sunday 14th June 8, 2015 from: http://mhealth.jmir.org/2014/2/e20/

Sarwar, M. & Soomro, T. R. (2013). Impact of smartphone's on society. *European Journal of Scientific Research, 98*(2), 216-226. Retrieved on Sunday, 17th May 2015 from: http://www.researchgate.net/profile/Tariq_Soomro/publication/236669025_Impact_of_Smartphone's_on_Society/links/00b7d518ce4de2509d000000.pdf

Taylor, M. (2013). Smartphones surprise by outstripping tablets 9:1 for ebook reading. Retrieved on Tuesday, 7th October 2014 from:http://activitypress.com/2013/04/02/smartphones-surprise-by-outstripping-tablets-91-for-ebook-reading/

VOXBURNER (2013). Smartphones the Most Used Device by 16 to 24s to Read eBooks. Retrieved on Tuesday, 16th September 2014 from: http://www.voxburner.com/publications/340-smartphones-the-most-used-device-by-16-24s-to-read-ebooks

We are Social (2014). Global digital statistics 2014: We are social's snapshot of key digital indicators. Retrieved on Tuesday, 16th September 2014 from: http://etonpreneurs.com/uploads/Global%20Social,%20Digital%20&%20Mobile%20Statistics,%20Jan%202014.pdf

West, D. M. (2013). Mobile Learning: transforming education, engaging students, and improving outcomes. Retrieved on Tuesday, 16th September 2014 from: http://www.insidepolitics.org/brookingsreports/MobileLearning.pdf

Woodcock, B. (2012). Considering the smartphone learner: An investigation into student interest in the use of personal technology to enhance their learning. Retrieved on Monday, 15th September 2014 from: http://research.shu.ac.uk/SEEJ/index.php/seej/article/download/38/Woodcock