Learning Impact(s) of Smartphones on South African Rural University Students

Samuel Oluwatobi Taiwo
PhD Candidate, Business Management University of Fort Hare Eastern Cape, South Africa, email address: samueloluwatobi71@gmail.com

Uleanya Chinaza
Professor, Education Leadership and Management University of Johannesburg Johannesburg, South Africa, email address: chinazamoses90@gmail.com; chinazau@uj.ac.za

Makhosazana Magigaba
Senior Lecturer, Business Management University of Zululand KwaZulu-Natal, South Africa, email address: MagigabaM@unizulu.ac.za

Abstract: Smartphones in some cases are considered a source of distraction for students during teaching and learning exercises. However, with the outbreak of the COVID-19 pandemic, the use of smartphones in educational institutions for teaching and learning purposes has become almost inevitable. Therefore, this study investigates the learning impact(s) of the use of smartphones on South African Rural Higher Education Students (SARHES). The quantitative method was adopted for the study. Convenience sampling was used in selecting the institution of learning, the department, the level, and the 75 respondents who participated in the study. Data were analysed using Statistical Package for the Social Sciences (SPSS) version 25. The findings of the study showed that students are significantly affected by the use of smartphones due to their cutting-edge features and functions, internet access, business advertisements, and mobile entertainment, as well as others. The study therefore highlights the need for conscious, consistent periodic seminars, workshops, talks, and colloquiums designed to help students see the importance of focus, planning and time management in the use of smartphones for learning in order to avoid distractions.

Keywords: smartphones, South African Rural Higher Education Students (SARHES)

https://doi.org/10.24193/JRHE.2023.2.5

Introduction

Education has evolved over time (Winstead, 2021; Fink, 2020) and continues to undergo various forms of transformation (Winstead, 2021; Ashwin, 2019; Leal Filho, Raath, Lazzarini et al. 2018). Using higher education as an example, Ashwin (2019, 1) categorically states that "higher education is about transformation." This implies that transformation in the education sector is expected to be a common phenomenon, while it promotes different forms of transformation in society (One Planet, 2021; Chasi & Rodny-Gumede, 2020; Leal Filho, Raath, Lazzarini, et al. 2018). The United Nations Educational, Scientific and Cultural Organization (UNESCO) (2021) highlights a number of reasons supporting the need for transformation in education, among which various dimensions of challenges, such as pandemics, climate change, violence, or hateful ideologies, can be numbered. Meanwhile, according to Chasi and Rodny-Gumede (2020), the attempt to transform campuses where teaching and learning activities and other diverse forms of learning take place is an attempt to transform society. This implies that the transformation of a society in some instances hinges on the transformation of educational institutions. This corroborates the results of the work of Uleanya and Uleanya (2021) and Dani and Shah (2016), who hold the view that rural educational institutions are strategically established in certain locations to promote certain transformation. As the ancient Greek philosopher Plato says, necessity is the mother of invention (Whyte, 2009). However, the idea of necessity originates from the age-old concept of needs. Therefore, in an attempt to meet the needs as they arise, creativity was triggered and innovatively used to birth groundbreaking inventions, which have altered the course of human history and have provided human society with several options to meet a single need, as seen in the case of the need for education. The drastic changes that have occurred in the phases of human development have birthed several kinds of learning ranging from traditional learning, commonly called T-learning, to M-learning, otherwise called mobile learning, in an attempt to satisfy the educational needs of human beings.

Traditional Learning (T-learning)

According to Balaji Al-Mahri, and Balaji, (2016), T-learning is a predominant form of education which entails face-to-face learning, wherein the teacher imparts knowledge to the students, provides them with educational materials, and evaluates them through broad assessments in the schoolroom or lecture hall at a specified time. T-learning is teacher-motivated and teacher-controlled (Novak, 2010; Sarrab, Elgamel, and Aldabbas, 2012; Sarrab, Alzahrani, Alwan, and Alfarraj, 2014), and students must be physically located in the classroom to gain the knowledge needed (Sarrab, 2015). Additionally, Ntloedibe-Kuswani (2013) opine that T-learning is directed by the trainer because trainees rely on message transmitted by the trainer. In response to the limits of T-Leaning, which include rigidity in learning method and inaccessibility to learning materials, D-learning came into being (Balaji et al., 2016).

Distance Learning (D-learning)

Balaji et al (2016) avers that courses and curriculum in D-learning are offered to those who have the intent to study but cannot sit in a classroom to receive instructions from tutors because they are disabled, employed, or lack sponsors. Alalwan, Alzahrani, and Sarrab (2013) elucidate that experts have come up with another kind of learning that involves the use of information and communication technology and accessibility to electronic media, known as electronic learning.

1. *Electronic Learning (E-learning)*

E-learning originated in the period 1980–1990 (Hashemi, Azizinezhad, Najafi, and Nesari, 2011). It involves online learning or courses where education is accessible via internet connection, regardless of time or location, with desktop and laptop computers as its basic devices (Balaji et al., 2016). E-learning heightens interaction and adeptness of learning because it offers students with greater ability to interact with their teahcers, fellow students, and educational materials (Novak, 2010; Sarrab, Elgamel, and Aldabbas, 2012). However, the mobility of students is restricted due to the nature of the devices used in the electronic learning process. Consequently, a new form of learning known as

Mobile Learning has emerged in recent years based on mobile technologies such as notebooks, wireless technology, and smartphones, which are products of the rapidly changing technological environment (Ozdamli, and Cavus, 2011; Balaji et al., 2016). Thus, Chen, Yen, and Chen (2009) consider smartphones as instruments of M-learning as being extremely significant to students.

2. Mobile Learning (M-learning)

M-learning is a form of learning that requires the aid of mobile devices, or the connection of mobile technology and E-learning (Quinn, 2000; Pinkwart, Hoppe, Milrad, and Perez, 2003). Mehdipour and Zerehkafi (2013) define M-learning as any kind of knowledge acquisition that occurs irrespective of the location through mobile technologies. Geddes (2004) views M-learning as information or skill acquisition through mobile devices anytime and anywhere. Ligi and William Dharma Raja (2017) describe M-learning as the provision of educational materials on personal pocket devices like tablets, mobile phones, PDAs, smartphones, and I-pads. Unterfrauner (2011) sees M-learning as 'E-learning using mobile devices and wireless transmission'. Korucu and Alkan (2011) argue that M-learning is a unique technological phenomenon with its own terminology, in contrast with E-learning which shares the same terms as T-learning. Mehdipour and Zerehkafi (2013) maintain that mobile learning transcends just a combination of words; rather, it is a further developed version of and response to E-learning; therefore, M-learning indirectly means mobile E-learning. Ligi and William Dharma Raja (2017) explicate that M-learning involves the usage of mobile technology to facilitate the acquisition of knowledge at the rhythm of the learner, irrespective of place and time, with or without other ICT gadgets. Furthermore, Ligi and William Dharma Raja (2017) maintain that mobile technologies offer teachers in today's world a platform for a student-centred approach to learning, where students can check learning materials from different sources, generate content, and connect with fellow students anywhere.

3. Efforts Geared Towards Utilising M-learning in Teaching and Learning

Mehdipour and Zerehkafi (2013) reveal that in the last decade, mobile learning has matured from an insignificant research area to myriads of major undertakings across institutes, enterprises, exhibit archives, municipalities and countryside around the world.

The work of Mehdipour and Zerehkafi (2013) further shows that the research carried out on the usage of mobile applications is highly reassuring, as seen in the results of a study financed by the Education Department of the United States. This study focused on the connection between learning and the Educational Game Application for Kids called 'Martha Speaks Dog Party', by the Public Broadcasting Service (PBS). The study reveals that there was a 31% improvement in the vocabulary of children between three to seven years old following daily use of the application for 14 days. Another study of this kind is the one carried out by Abilene Christian University which focused on the use of the Statistics 1 application (Mehdipour & Zerehkafi, 2013). The students stated that they understood the message better and were inspired to succeed after using the Statistics 1 application inside and outside the schoolroom. Tutors supported the comments of the students, stating that learners were more ready for the lessons.

In South Africa, statistics have proven that three quarters of recent internet users, mostly young black people who live on a maximum of R1500 monthly, go online to be informed, to meet people, learn, work, or search for jobs through their mobile phones (de Lanerolle, 2012). To meet the need of these young people to learn in the 21st century context, concerted efforts have been made to use M-learning in the educational sector of the country, as seen in Mxit – a mobile service.

MobileBeyond (2017) describes Mxit as a mobile service and lifestyle company with disruptive technology which provides instant messaging service, mobile voice clips, community-based applications and entertainment mainly to young people in South Africa. Mxit (2018) presents itself as an extremely data-light portable social network with a bionetwork of facilities that offers its users the opportunity to connect with each other in a way that is creative and economical. Mxit was created by an ICT company that deals exclusively in software development and telecommunications operations called Swist Group Technologies (MobileBeyond, 2017) in 2005 (Afolayan, 2016; Mxit, 2018).

Swist Group Technologies was started in Stellenboch (O'Hagan, 2013) by a Namibian born (Thomas, 2015); University of Stellenboch communications graduate; computer programmer, technical specialist & consultant Herman Heunis (MobileBeyond, 2017) with seven workers (Afolayan, 2016). Swist Group Technologies grew from a team of eight individuals to more than 100 people due to the rapid growth of Mxit (Thomas, 2015; Afolayan, 2016), which is traceable to the lump sum investment of a multinational

media company named Naspers Limited in Mxit in 2007, giving Naspers Limited a 30% ownership right in Mxit (MobileBeyond, 2017).

In 2011, Mxit already had a user base of 500,000 in Indonesia and was being used in 120 countries (Afolayan, 2016; MobileBeyond, 2017), which, inter alia, included Malaysia, Kenya, India, Indonesia, the United States, Nigeria, Brazil, Italy, Portugal, and Spain, before it was sold by Heunis to Alan Knott-Craig Jr., the founder of World of Avatar; a venture capital firm for about R330 million (Atagana, 2012) to R500-million (Thomas, 2015). In 2013, Mxit had gained popularity among young people in South Africa far beyond Facebook, so much so that it had a user base of 45 million registered users in the country, growing daily by 60,000 new registered members, with 750 million messages being sent every day (Afolayan, 2016).

The landmark growth of Mxit was not surprising, seen from its strategic position in satisfying the needs of young people in going online to be informed, meet people, learn, work or job-hunt through their mobile phones, as well as using myriads of other services which address many aspects of the human life.

In short, Mxit provided a platform for M-learning in South Africa as a nation and across Africa as a continent. Mxit (2018) affirms that it had a great impact in improving people's lives by giving them access to educational, medical, and psychological services at no cost. Despite closing down operations as a profit-driven organisation in 2015 (Afolayan, 2016), Mxit continues to impact lives through The Reach Trust (Mxit, 2018) as it transferred its intellectual property to this charitable arm of Mxit (Thomas, 2015). The Reach Trust was established in 2012 to motivate and improve living by developing ground-breaking and economical mobile solutions, through which free education, health, and counselling services have been offered to 10 million people on their mobile phones (The Reach Trust, 2018).

In addition to the foregoing, the usefulness of smartphones for teaching and learning and other endeavours in different walks of life is immense. However, the question remains: can smartphones really promote teaching and learning, considering all the possible distractions arising from their features. Therefore, this study explores the learning impact of smartphones on SARHES. To achieve the goal of this study, an attempt

is made to answer the identified research question guiding this study: What are the impacts of smartphones on selected SARHES?

Methodology

The present study employed a quantitative method. In this case, only the use of a large number of respondents is acceptable (Kumar, 2019; Creswell, 2014). The convenience sampling technique was adopted for selecting the rural university, department, and category of students and respondents of the study. According to Kumar (2019) and Creswell (2014), convenience sampling enables researchers to select respondents/participants who qualify to participate in the study based on their convenience.

Prior to embarking on data collection for this study, the researchers sought permission in form of ethical clearance. This was issued by the appropriate body in the selected rural institution of higher education in South Africa, which gave the researchers the opportunity to carry out the process of data collection. A questionnaire consisting of two sections was used for data collection. The first section aimed at collecting demographic data from respondents. The second section was aimed at collecting data on the impacts that smartphones have on SARHES. The questionnaire was designed using a 3-point Likert scale (agree, disagree, and indifferent). At the time when this study was conducted, the total number of students registered for the Bachelor of Commerce honours degree programme at the selected rural university was 83. The researchers proceeded to administer questionnaires to the 83 students registered for the programme. However, only 75 of the questionnaires were analysed. This was due to the return rate. The data collected were analysed using the Statistical Package for the Social Sciences (SPSS), version 25.

Results

Analysis and Interpretation of the Demographics of the Respondents

The results of the analysed data are presented in this section, beginning with the demographic information of the respondents, which are presented in Tables 1 and 2. Table 3 is used to present the analysis of respondents' responses to research items in the second section of the questionnaire.

Table 1. Gender Distribution of the Respondents

Category	Frequency	Percent	Cumulative Percent
Male	29	38.7	38.7
Female	46	61.3	100.0
Total	75	100.0	

Table 1 above shows the gender distribution of the respondents in this study, 38.7% of the 75 respondents were male, while 61.3% were female. Therefore, there are more women respondents in this study than there are men.

Table 1. Socio-Economic Status of Respondents

Category	Frequency	Percent	Cumulative Percent
High	10	13.3	13.3
Middle	45	60.0	73.3
Low	20	26.7	100.0
Total	75	100.0	

Table 2 above shows the socioeconomic status of the respondents in this study. 13.3% of the respondents indicated coming from a high socioeconomic background, 60% were from the middle class, and 26.7% of the respondents were from the low level socio-economic background. Therefore, most of the respondents in the study come from the middle-level socio-economic background.

Research Question: What are the impacts of smartphones on selected SARHES?

Table 3: Impacts of Smartphones on Respondents

S/N	Statement/Variable	Agree	Disagree	Indifferent	Missing
1.	The smartphone is a mobile phone with cutting-edge features and functions like game playing, picture display, video viewing, direction-finding, audio/video replay and recording, mailing, social networking, and browsing among others.	96%	1.3%	2.7%	0%
2.	Smartphones have impacted all aspects of life such as business, education, health and social life.	93.3%	1.3%	5.3%	0%
3.	Through smartphones, mobile application markets are now in operation, which includes iPhone, Blackberry, Android, Microsoft mobile application markets.	86.7%	1.3%	12%	0%
4.	Mobile application publishers and distributors enjoy smartphones.	73.3%	4%	21%	1.3%
5.	Service providers are getting large revenue by providing ads as a part of mobile application.	78.7%	0%	17.3%	4.0%
6.	Smartphones have brought effectiveness to advertising in business sectors	94.7%	1.3%	4.0%	0%
7.	Smartphones serve as devices for mobile entertainment where blogs can be updated, videos can be watched and blogged, and music can be heard and blogged.	93.3%	0%	6.7%	0%
8.	Rise in mobile internet access can be traced to smartphones.	93.3%	0%	6.7%	0%
9.	The spread of e-commerce sites is a function of smartphones.	76.0%	6.6%	16.0%	1.3%

Table 3 gives an overview of the variables in the SQ that were aimed at exploring the learning impact of smartphones on the respondents, with their corresponding results from the study in percentages. A total response rate of 100% was recorded for the first variable, "The smartphone is a mobile phone with cutting edge features and functions like game playing, picture display, video viewing, direction finding, audio / video replay and recording, mailing, social networking, and browsing among others" as there were no missing responses. 96% of the respondents agreed, 1.3% disagreed, and 2.7% were indifferent. Therefore, it follows that game play, picture display, video viewing, direction finding, audio / video replay and recording, mailing, social networking, and browsing features and functions on smartphones has significantly impacted respondents in this

study. A total of 100% response rate was recorded for the second variable 'Smartphone has impacted all aspects of life such as business, education, health, and social" as there were no missing responses. 93.3% of the respondents agreed, 1.3% disagreed, and 5.3% of the respondents were undecided. Therefore, respondents are not immune to the pervasive impact of smartphones in all aspects of life including business, education, health, and social life amongst others, as most of the respondents agreed. In the same vein, a total of 100% response rate was recorded for the third variable 'Through smartphones, mobile application markets are now in operation, which include iPhone, Blackberry, Android, Microsoft mobile application markets' since there was 0% missing response. 86.7% of the respondents consented, 1.3% differed, while 12% were undecided. Therefore, respondents have been impacted by mobile application markets, as most of the respondents agreed. A 99.7% response rate was recorded for the fourth variable 'Mobile application publishers and distributors enjoy smartphones", since 1.3% of responses were missing. 73.3% conceded, 4% did not, while 21% neither agreed nor disagreed. A 96% response rate was recorded for the fifth variable "Service providers are getting large revenue by providing ads as a part of mobile application", since 4% of responses were missing . 78.7% agreed, none disagreed, while 17.3% were indifferent. A total of 100% response rate was recorded for the sixth variable "Smartphones have brought effectiveness to advertising in business sectors", as none of the responses was missing. 94.7% agreed, 1.3% disagreed, and 4% were indifferent. A total response rate of 100% was recorded for the seventh variable 'Smartphones serve as devices for mobile entertainment where blogs can be updated, videos can be watched and blogged, and music can be heard and blogged', as none of the response was missing. 93.3% agreed, none disagreed, while 6.7% were indifferent. A total of 100% response rate was recorded for the eighth variable 'Rise in mobile Internet access can be traced to the smartphone', as none of the responses were missing. 93.3% agreed, none disagreed, while 6.7% were undecided. A 99.7% response rate was recorded for the ninth variable "The spread of e-commerce sites is a function of smartphones" as none of the responses were missing. 76% agreed, 6.6% disagreed, while 16% were undecided. The foregoing reveals that students of the selected rural South African university have been significantly affected by smartphones.

Discussion

The analysis of the data collected, addressing the research question 'What are the impacts of smartphones on selected SARHES', reveals that the students from selected rural South African universities are significantly impacted by smartphones. This finding confirms the assertion of scholars such as Chen, Yen and Chen (2009), who declare that smartphones are extremely significant to students as it enhances routine tasks through the availability of limitless information on the Internet, as well as Ligi and William Dharma Raja (2017), who hold the view that smartphones used as devices for M-learning are capable of enhancing educational materials. The results of this study also corroborate the work of Sarwar and Soomro (2013), who affirm that the smartphone has impacted virtually all areas of human society both positively and negatively. Furthermore, this finding reveals that the cutting edge features and functions of the smartphone, internet access, business adverts and mobile entertainment are the most prevalent impacts of smartphones on the students of the selected rural South African university. Sello (2012), assessing the impact of smartphones and regular cellular phones on the education of students from rural South African universities, found that smartphone users exceed regular phone users among students. The prevalent impacts of smartphones on the students of the selected rural South African university, as revealed in the present study, explain Sello's (2012) findings. It is evident that a transformation can be induced in teaching and learning processes through the inclusion and use of smartphones based on its various features and functions. Attaining such a transformation in educational institutions can have a ripple effect on the experiences in society, as the work of Chasi and Rodny-Gumede (2020) also shows.

Conclusion and Recommendations

Smartphones possess vital features capable of promoting teaching and learning activities. Thus, the inclusion and use of smartphones in learning is expected to improve teaching and learning exercises, as well as enhance the learning abilities of students. The fact that SARHES who are described as being disadvantaged based on a lack of infrastructure and access to quality internet are being significantly impacted by smartphones in different areas and ways, implies that smartphones are crucial for students. However, the potential benefits of smartphones are not likely to be enjoyed if the right infrastructure is not made available, and students are not guided. Thus, the study shows that periodic seminars, talks, workshops, and colloquiums targeted at assisting students to embrace the benefits of smartphone use through planning and appropriate time management are necessary. This would help students remained focused.

1. *Limitations and suggestions for further study*

The present study was limited to respondents undertaking a Bachelor honours degree in the field of commerce. The finding may not be generalisable. Therefore, it is suggested that similar studies be conducted using two or more rural higher education institutions within and outside South Africa.

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