

# EVALUATING MOBILE-CENTRIC READINESS OF HIGHER EDUCATION INSTITUTIONS: THE CASE OF INSTITUTIONAL POLICIES AND INFORMATION SYSTEMS STUDENTS

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## ABSTRACT

Many higher education students live and operate in mobile-centric environments. The question is whether the policies of higher education institutions (HEI) are aligned with students' readiness for mobile technology information access and interaction. To investigate this question from a policy perspective, nine policies from the open and distance learning (ODL) university in South Africa were analysed for providing institutional mobile-centric support. Policy document analysis was used to evaluate five information and communication technology (ICT) policies and four teaching and learning policies. The analysis focused on how the policies support the provision of mobile infrastructure, technical support and learning resources. To investigate from the students' perspective, quantitative data was captured on Information Systems students' readiness through a survey of a total of 129 respondents from the same university. The mobile-centric readiness of students was evaluated based on factors that could affect the readiness of students in accessing and interacting with mobile-centric services. The factors investigated were infrastructure ownership, knowledge of mobile phone features and mobile phone Internet activities. The findings revealed that Information Systems students are ready to use mobile phones as tools for information access and interaction, but some inadequacies were observed in the way the policies support the students' needs. This study proposes some recommendations on how the policies could better support students' mobile phone information access and interaction.

## KEYWORDS

mobile-centric services, mobile information access, mobile readiness, policies

## INTRODUCTION

There is compelling evidence to show that HEIs operate in environments that are ready for mobile technology information access and interaction. The evidence is based on statistical reports produced by ICT research organisations over the past years, which show a progression in mobile technology adoption in developing countries (Kearney, 2013; Ericsson, 2015; ITU, 2015). The reports identify mobile cellular technology as the fastest growing technology that people can afford and own (Kearney, 2013). As a consequence, mobile phones have provided a platform for information access and interaction to people who were previously sidelined by lack of ownership and access to appropriate ICT technologies (Brown, Campbell & Ling, 2011). However, the benefits of mobile phone penetration have not been homogeneous across the spectrum of people's lives, in particular in education relative to business and social life. Even though mobile phones are presumed to be appropriate information access and interaction tools in pedagogy (Traxler & Vosloo, 2014), their uptake has not been fully realised. The slow growth in the integration of mobile phones in teaching and learning has been a cause of concern for the last decade, and Keegan (2005, p. 9) raised the following questions, "Why has mobile learning not yet emerged from its project status and not yet taken its place in mainstream provision? Why does it remain at the research project level and not emerge into a serious form of provision?" To date, the questions have not been sufficiently answered.

As HEIs face these challenges, literature has reported on some proposed solutions for integrating mobile phones in pedagogy. The proposed solutions are frameworks that focused on m-learning systems design (Martin et al., 2010), m-learning adaptation (Motiwalla, 2007), classification of m-learning activities (Park, 2011), adoption (Cheon, Lee, Crooks & Song, 2012) and design of m-learning activities (Muyinda, Lubega, Lynch & van der Weide, 2011). The frameworks are biased towards providing content for contextual m-learning as an extension of e-learning. The frameworks put less focus on mobile phones as tools that provide students with the ability to access and interact with information irrespective of whether the information is for learning or administration and whether the students are mobile or not. Hence, the analysed m-learning frameworks fall short of addressing the practicalities of providing mobile-centric services to students in full. In this respect, some research identified factors that restrain full integration of mobile-centric services in pedagogy as technological factors, economic factors, institutional policies and human factors (Botha, Batchelor, Traxler, De Waard, & Herselman, 2012; Isaacs Vosloo & West, 2012). This study investigated the human factors and institutional policies.

The investigation was undertaken as a case study at an open and distance learning (ODL) university in South Africa. With respect to institutional policies, this study investigated the mobile-centric readiness of two university policy groups, namely ICT, and teaching and learning policies. With respect to the students' mobile-centric readiness, this study targeted Information Systems (IS) students and investigated their mobile-centric readiness. The relatively small sample of 129 students is a limitation in terms of generalising the student-readiness findings. However, the

findings on matching student readiness with policies are generalisable. The rationale for selecting students from the discipline of information systems is that if they had problems with using the technology; this would also apply to most other students. Hence this study has two objectives, which are: (1) to evaluate the readiness of the university policies in supporting the provision of mobile-centric resources, information access, communication and infrastructure and (2) to examine the mobile-centric readiness of IS students at the university. The two objectives translate into the following research questions, (1) What is the status of the university policies in supporting the provision of mobile-centric services in teaching and learning? (2) How ready are the IS students in accessing and interacting with mobile-centric services at the university?

The paper is organised as follows: literature review analysis of frameworks for evaluating digital readiness; research methodology; data analysis results; discussion; and conclusion of the study. The following section presents a literature review of the frameworks for evaluating digital readiness.

## FRAMEWORKS FOR EVALUATING DIGITAL READINESS

The digital readiness of an institution or a person in using ICT-related technologies such as mobile cellular phones is known as e-readiness (Sachs, 2000). E-readiness is defined as the degree to which a community is prepared to participate in the networked world (Sachs, 2000). In line with this definition, this study seeks to understand the concept of digital readiness by reviewing e-readiness frameworks in the context of HEIs. The frameworks reviewed in this study focus on evaluating e-learning readiness. For the purpose of this study e-learning is considered an umbrella term that covers the provision of learning through electronic media such as computers and mobile phones.

This study reviewed four e-readiness frameworks. They are an eclectic model for assessing e-learning readiness in the Iranian universities (Darab & Montazer, 2011), a readiness combination model for acceptance of e-learning (Borotis & Poulymenakou, 2004), the Machado model (Machado, 2007) and the Haney model (Haney, 2002). The consensus among the models for evaluating e-readiness is that when introducing e-learning at an institution, all the stakeholders that would be involved in the project have to be assessed for e-readiness (Borotis & Poulymenakou, 2004; Darab & Montazer, 2011; Haney, 2002; Machado, 2007). The stakeholders include administrative managers, academics, and students. Common dimensions among all the proposed models for evaluating e-readiness were infrastructure, finance, human resources and course content. The frameworks do not directly inform the readiness of students in using mobile-centric services in pedagogy, but there are some common dimensions, which could be summarised as follows:

- Infrastructure readiness assessment focuses on evaluating whether existing infrastructure could sustain the new intervention. If the existing infrastructure cannot provide or sustain the services of a new intervention, the institution would be expected to provide the required infrastructure. This dimension is important in this study because students would only use mobile phones as information access and interaction tools if they own or have access to the devices.
- Human resources readiness focuses on evaluating the incumbents in terms of motivations, attitudes, resistance and skills required in providing e-learning. With respect to human resources readiness, Machado (2007) recommended that prior to the implementation of e-learning services, it is important to understand the administrators' vision, their abilities in implementing policies and strategies that inform e-learning. The policies and strategies would be expected to capacitate other stakeholders in terms of motivation and training.

The readiness combination model for the acceptance of e-learning (Borotis & Poulymenakou, 2004) has a unique dimension, which is the business dimension. Business readiness is measured by assessing institutional goals, needs, motivators, resources and constraints with respect to e-learning. Two of the models, the eclectic model for assessing e-learning readiness in the Iranian universities (Darab & Montazer, 2011) and the readiness combination model for acceptance of e-learning (Borotis & Poulymenakou, 2004) suggested that e-readiness evaluation could be based on institutional culture. The cultural aspect is important in this study because it is essential to understand the mobile-centric culture of students. The mobile-centric culture of students is a characteristic of the generation Y culture (Noble, Haytko, & Phillips, 2009). The generation Y people have been described as people born with technology (Prensky, 2001), have a high aptitude for technology use, propensity for establishing social networking groups and quickly turn to Internet for information access (Ling & Horst, 2011).

The technological culture and infrastructure ownership readiness of students is the basis of mobile-centric readiness evaluation in this study. Hence, the research question posed is, "How ready are the Information Systems students in accessing and interacting with mobile-centric services at the university?"

Apart from the students' technological culture and infrastructure ownership, the usage of mobile phones as pedagogic tools also depends on the readiness of institutional policies. The readiness of institutional policies in supporting the provision and utilisation of mobile-centric services has been identified as a critical factor in pedagogy (Traxler & Vosloo, 2014; Vosloo, 2012). Vosloo (2012) observed that ICT policies in pedagogy were obsolete and were failing to guide full integration of mobile-centric services at HEIs. This is in line with Czerniewicz and Ngugi (2007), who found South African ICT educational policies fragmented and lacked strategy for supporting the use of ICT in pedagogy. In this respect, Vosloo (2012) found South African ICT educational policies to mostly govern the provision of infrastructure, but weak in terms of curriculum design and assessment. Furthermore, Traxler and Vosloo (2014) argued that the benefits of mobile-centric services would not be realised in pedagogy if they are not supported by policy. UNESCO identifies

this as a problem that needs urgent attention (UNESCO, 2011). In an effort to find solutions, UNESCO has organised at least three Mobile Learning Week symposiums since 2011 to discuss the issue of m-learning policy (UNESCO, 2011; UNESCO, 2013; UNESCO, 2014). At present the outcome of the Mobile Learning Week symposium is the publication of guidelines that inform the design of policies that regulate the use of mobile technology in education (Kraut, 2013). This highlights the importance of policy as a critical factor that supports the provision of mobile-centric services in pedagogy. Hence one of the research questions posed in this study is, “What is the status of the university policies in supporting the provision of mobile-centric services in teaching and learning?”

## RESEARCH METHODOLOGY

This study evaluated the mobile-centric readiness of IS students as well as institutional policies in supporting the provision of mobile-centric services. The research was undertaken as a case study at an ODL university in South Africa. The research questions are:

- What is the status of the university policies in supporting the provision of mobile-centric services in pedagogy?
- How ready are the IS students in accessing and interacting with mobile-centric services at the university?

The study employed two data collection instruments to collect data - a policy document analysis and a quantitative student survey. The following section presents research context, design of data collection instruments and samples.

### RESEARCH CONTEXT

The University of South Africa (UNISA) is 140 years old. UNISA is the largest ODL university in South Africa with a student population of over 350,000. The majority of the students are from African countries. The university operates in an environment which is technologically ready to provide mobile-centric services due to high levels of mobile phone penetration. According to ITU (2015), the South African mobile phone penetration has surpassed 100%, which implies that majority of the people in the country have access to a mobile device. Hence, this provides an environment that has the potential to be conducive to the provision of mobile-centric services.

### POLICY DOCUMENT ANALYSIS

The design of the policy document analysis protocol employed in this study was informed by the e-readiness frameworks discussed in the study. Based on the frameworks, the factors adopted for evaluating e-readiness are infrastructure readiness, technical expertise readiness, and resources readiness. In addition to these parameters, the policy document analysis protocol also analysed how the policies support mobile phone communication and interaction (Kraut, 2013). Table 1 presents the document analysis protocol of this study.

TABLE 1: DOCUMENT ANALYSIS PROTOCOL

<b>Name of policy</b>	What is the name of the policy?
<b>Purpose</b>	What is the purpose of the policy?
<b>Integration of mobile technology</b>	How does the policy address the integration of mobile technology in pedagogy?
<b>Providing technical training</b>	Which student development intervention does the university have in place?
<b>Providing mobile phone infrastructure</b>	How is the infrastructure provided and supported by the university?
<b>Providing access to mobile phone resources</b>	What are the guidelines for providing students with access to mobile phone resources?
<b>Supporting student communication and interaction</b>	What are the guidelines for lecturer to student communication and interactions?

The study employed purposeful sampling to select nine policies for analysis; four were Teaching and Learning policies, and five were ICT policies. The policies are available on the university website and are accessible to all members of the university (UNISA 2015). The Teaching and Learning policies covered the following areas: *Tuition; Curriculum; Open distance learning (ODL); and Prescribed books and journal articles*. The ICT policies covered: *ICT mobile device; Telephone and cell phone; Sending of SMS and emails to students, Internet; Electronic communication and web management; and Broadband agreements*.

Policy document analysis was based on the Framework Analysis method (Ritchie & Spencer, 1994). The advantage of the Framework Analysis method is that it is inductive and has systematic stages of analysing data. The stages are familiarising, identifying a thematic framework, indexing, charting, mapping and interpretation.

### STUDENT SURVEY

A quantitative survey was used to collect data from students. Purposeful sampling was used to enroll the participants and 129 students completed the questionnaire. The students were third-year IS students registered for a database course in the School of Computing at the university. The gender ratios of the students were 32% female and 68% male.

The design of the questionnaire was informed by the findings of the literature review analysis. The questionnaire had three sections, all with close-ended questions. Table 2 presents the survey questions. The first question measured

the mobile-centric readiness of students based on ICT infrastructure ownership. A list of devices was provided to students that included mobile phone, laptop, printer, desktop computer and iPad or tablet PC. The second question measured the mobile-centric readiness of students based on their knowledge of mobile phone features. A list of fifteen mobile phone features was provided to students and included SMS, Internet access, camera, video player, email and apps download, to mention just a few. The third question measured the mobile-centric readiness of students based on the Internet activities that they engage in through a mobile phone. A list of 16 activities was provided that included search Internet for facts, access health information, and watch videos online, to mention just a few.

TABLE 2: STUDENT SURVEY QUESTIONS

Question	Response
1. Which of the following electronic communication devices do you own? (The devices were then listed, e.g., Mobile phone, laptop ...)	Yes <input type="checkbox"/> No <input type="checkbox"/>
2. Which of the following features are available on your mobile phone? (The features were then listed, e.g., SMS, Internet, camera ...)	Yes <input type="checkbox"/> No <input type="checkbox"/> I do not know <input type="checkbox"/>
3. As part of your normal routine, to what extent do you engage in the following activities on your mobile phone? (The activities were then listed, e.g., Search Internet for facts, watch videos ...)	Not applicable <input type="checkbox"/> Never <input type="checkbox"/> Seldom <input type="checkbox"/> Often <input type="checkbox"/> Very often <input type="checkbox"/>

After collecting the data from the survey, it was cleaned in preparation for analysis. The questionnaire captured both nominal and ordinal data. Descriptive statistics were employed to analyse both the nominal and ordinal data in order to give a summary of how the group responded to each of the survey questions. Factor analysis was employed to uncover trends that were not visible from descriptive analysis.

## DATA ANALYSIS RESULTS

The data analysis results are divided into two sections - policy document analysis results and student survey results.

### POLICY DOCUMENT ANALYSIS RESULTS

This section reports on the results of the first research question, namely “What is the status of the university policies in supporting the provision of mobile-centric services in teaching and learning?” The results are discussed under the following themes: integrating mobile technology; providing technical training; providing mobile phone infrastructure; supporting student mobile phone communication; and interacting with and providing access to mobile phone resources.

#### INTEGRATING MOBILE PHONE TECHNOLOGY

The policies were updated to govern the use of mobile technologies at the university. The university introduced two new ICT policies and revised two ICT policies and three teaching and learning policies to reflect the dynamics and the evolution of mobile technology in teaching and learning as detailed in Table 3.

TABLE 3: ANALYSED POLICIES

Policy name	Approved data	Revision date
<b>ICT policies</b>		
<i>Policy on sending SMS and emails to students</i> (new)	04-10-2011	23-11-2012
<i>ICT Mobile device policy</i> (new)	20-09-2013	
<i>Telephone and cell phone policy</i> (revised)	29-07-2005	22-11-2013
<i>ICT policy on broadband agreements</i> (revised)	26-06-2008	22-11-2013
<b>Teaching and learning policies</b>		
<i>Tuition policy</i> (revised)	29-07-2005	05-04-2013
<i>Prescribed books, readers, and journal articles policy</i> (revised)	30-09-2005	20-09-2013
<i>Curriculum policy</i> (revised)	19-11-2010	23-11-2012

The purpose of the teaching and learning policies includes providing principles that guide pedagogy, guidelines for prescribing study material, and curriculum design. The policies seem to address the issue of providing mobile technology services under the banner of integrating innovative technology in pedagogy. Furthermore, the ICT-related policies provide general guidance on the provision of ICT infrastructure, security, ethical behaviour, communication, and interaction on the university network. Therefore the policies implicitly support the provision of mobile-centric services in teaching and learning.

#### PROVIDING TECHNICAL TRAINING

The policies provide training for empowering lecturers with digital technical skills. Three policies – *Tuition*, *Open Distance Learning* and *Curriculum* – addressed the issue of lecturer training with respect to integrating technology.



Two of the policies, namely *Tuition* and *Open And Distance Learning*, addressed the issue of lecturer training in general without specifying the type of training. In this respect, the *Curriculum* policy explicitly stated that employees would receive adequate training that could enable them to develop, implement and experience e-learning or m-learning. Therefore, the policy explicitly supports training for lecturers but there is no mention of student training.

#### **PROVIDING MOBILE PHONE INFRASTRUCTURE**

Three ICT policies addressed the provision of mobile infrastructure in terms of mobile phone ownership, access to network services and cost of broadband. The policies are: *ICT Mobile Device*;, *Telephone and Cell Phone*;, and *ICT Policy on Broadband Agreements*. The policies cover aspects of how university employees and students could own and use mobile devices on the university network. Ownership and use of mobile devices on the university network is granted under the following conditions: Bring Your Own Devices (BYOD), purchase a mobile device through a research funding grant, or own a university funded mobile device. The policies stipulate that device owners are responsible for the physical security of their devices and that access to the university network is granted under security conditions.

#### **SUPPORTING STUDENT MOBILE PHONE COMMUNICATION AND INTERACTION**

Mobile communication and interaction are regulated by both the Teaching and Learning policies and the ICT policies. The teaching and learning policies are broad, while the ICT policies are more specific. The two ICT policies that focus on aspects of mobile communication and interactions are: *Policy on Sending SMS and Email*; and *Internet, Electronic Communication, and Web Management Policy*. The policies provide code of conduct of how lecturers could communicate and interact with students. The code of conduct covers aspects of ethics, quality of communication, and providing students with equitable access to communication and interaction resources.

#### **PROVIDING ACCESS TO MOBILE PHONE RESOURCES**

The university supports the design of content for mobile access in general without providing guidelines on how to implement that. The teaching and learning policies address the issue in a general way, encompassing all types of technologies, and do not specifically refer to mobile technology. In particular, the *Open and Distance Learning Policy* recommends that lecturers design learning content that is accessible on the web and takes advantage of interactive technologies. The ICT policy that addresses the issue of designing content for online access is the *Internet, Electronic Communication and Web Management Policy*. The policy is broad and stipulates that lecturers should design quality online course material for students' access. The policy cautions lecturers from distributing learning content intended for registered students on social media platforms.

### **STUDENT SURVEY RESULTS**

The student survey results are discussed under the following categories: ICT infrastructure ownership, knowledge of mobile phone functionality, and mobile phone Internet activities.

#### **ICT INFRASTRUCTURE OWNERSHIP**

Mobile phone ownership was compared to other devices owned by the IS students. Students were asked a multiple-choice question that required them to choose from a list the ICT devices that they own, by a "yes" or a "no". The question reads, "Which of the following electronic communication devices do you own?" The results established that all the students (100%) owned a mobile phone. The second ranked device owned by the students was a laptop (81%), followed by a printer (54%), a desktop computer (53%) and an iPad/tablet (18.8%). Hence the results confirm that in terms of infrastructure ownership, most students are ready to use mobile phones as information access and interaction tools.

#### **KNOWLEDGE OF MOBILE PHONE FEATURES**

IS students were surveyed to see if they know the functionality of their mobile phones. They were asked to identify features on their mobile phones from a list of features with a "yes", "no" or "I do not know". The question reads, "Which of the following features are available on your mobile phone?" Table 4 presents the descriptive statistical analysis results. The results revealed that most students managed to identify most features on their mobile phones but a few failed. Some students could not identify the following features: apps download (8%), voice recorder (3%), or document reader (9%). Some students indicated that their mobile phones had no features such as Internet access (3%), emails (2%), camera (3%), video player (3%) or apps download (5%). Absence of such features affects the readiness of students in using mobile phones as information access tools.

TABLE 4: MOBILE PHONE FUNCTIONALITY

<i>Which of the following features are available on your mobile phone?</i>	Do not know	No	Yes
SMS	0.0%	0.0%	100.0%
Internet access	0.0%	3.1%	96.9%
Camera	0.0%	3.1%	96.9%
Video player	0.0%	3.1%	96.9%
Calendar	0.0%	0.0%	100.0%
Emails	0.8%	2.3%	96.9%
MP3 player	2.3%	3.1%	94.6%
Voice recorder	3.1%	4.7%	92.2%
Games	0.0%	3.9%	96.1%
Document reader	8.5%	9.3%	82.2%
Twitter	7.0%	10.9%	82.2%
Clock	0.0%	0.0%	100.0%
Maps	8.5%	9.3%	82.2%
Instant Messenger	11.6%	6.2%	82.2%
Apps download	7.8%	5.4%	86.8%

### MOBILE PHONE INTERNET ACTIVITIES

IS students were asked to reveal Internet activities that they usually perform on their mobile phones. The question reads, “As part of your normal routine, to what extent do you engage in the following activities on your mobile phone?” Table 5 presents the descriptive data analysis results. The results show that there are certain activities that the students tended to perform more often than others. For example, checking email (83%), replying to emails (73%) or viewing pictures (75%). On the other hand, students rarely download videos (37%) and songs (32%) or watch online videos (24%). Further investigation using factor analysis was undertaken to see if there were some latent variables within the dataset and categorise the activities.

TABLE 5: GENERAL MOBILE PHONE ACTIVITIES

<i>“As part of your normal routine, to what extent do you engage in the following activities on your mobile phone?”</i>	N/A	Never	Seldom	Often	Very often
Search Internet for news	4%	8%	20%	22%	46%
Search Internet for facts	6%	19%	25%	19%	31%
Search Internet for health information	5%	15%	29%	25%	26%
Access sport results	6%	20%	26%	21%	26%
Search for movies or films	5%	32%	37%	12%	13%
Watch a video online	4%	24%	40%	14%	17%
Download videos	5%	37%	26%	16%	16%
Access and update social networking sites	4%	8%	21%	27%	40%
Check emails	4%	2%	12%	19%	64%
Reply to emails	4%	3%	19%	19%	54%
View pictures on a mobile phone	4%	5%	16%	37%	38%
Download songs	4%	32%	32%	12%	19%
Take pictures	4%	5%	15%	31%	45%
Download documents	4%	16%	22%	23%	35%
Surf the web	5%	26%	25%	21%	22%
Chat with friends	3%	9%	13%	24%	50%

Factor analysis identified three categories of student mobile phone activities and they are presented in Table 6. The three categories of factors were identified as information gathering, communication and social connection activities.

The factors were determined based on the eigenvalues, cumulative percentage of variance, and the Scree plots. The factor analysis extraction method used was the Maximum Likelihood and the rotation method was Varimax. An initial analysis

to get the eigenvalues for each factor extracted three factors with Kaiser's criterion of greater or equal to 1. The three factors had eigenvalues of 7.3205 (45.753%), 1.4975 (9.359%) and 1.0974 (6.842%). The three factors contributed a total variance of 61.95%. The three factors were returned for data analysis and the items with factor loading greater than 0.4 were considered to be valid. Reliability analysis was applied to each of the factors identified during Factor analysis. The results show that all the factors were reliable, with high scores of Cronbach's Alpha coefficients above 0.7.

TABLE 6: ROTATED FACTOR LOADINGS OF MOBILE PHONE ACTIVITIES

Item	Factor 1 (Information gathering activities)	Factor 2 (Communication activities)	Factor 3 (Social connection activities)
1. Search Internet for news	<b>0.59</b>	0.42	0.23
2. Search Internet for facts	<b>0.56</b>	0.19	0.15
3. Search Internet for health information	<b>0.59</b>	0.34	0.25
4. Access sports results	<b>0.50</b>	0.27	0.22
5. Search for movies or films	<b>0.60</b>	0.17	0.04
6. Watch a video online	<b>0.65</b>	0.09	0.34
7. Download videos	<b>0.75</b>	0.13	0.12
8. Access and update social networking sites	0.26	0.31	<b>0.46</b>
9. Check emails	0.23	<b>0.84</b>	0.25
10. Reply emails	0.28	<b>0.81</b>	0.24
11. View pictures on a mobile phone	0.26	0.30	<b>0.66</b>
12. Download songs	0.70	0.19	0.23
13. Take pictures	0.12	0.09	<b>0.78</b>
14. Download documents	0.53	0.52	0.24
15. Surf the web	0.55	0.26	0.34
16. Chat with friends	0.25	0.38	<b>0.45</b>
Eigenvalues	7.321	1.498	1.097
% Variance	45.75%	9.35%	6.84%
Cronbach's Alpha	0.90	0.90	0.84

## DISCUSSION

This study established that all the Information Systems students surveyed owned a mobile phone and seemed to be ready to use mobile phones as information access and interaction tools. Matching students' mobile phone ownership with the contents of policies, the policies did not address the issues of providing students with mobile phone devices. The policies encourage students to bring their own devices (BYOD) and use them to access the university network. The implication of the BYOD is that students have a variety of mobile phones, with some having better functionality than others; for example, smart phones compared to feature phones. As established in this study, some students indicated that their mobile phones had no multimedia capabilities, for example, features such as apps download, emails, video player and document reader. Such mobile devices would be difficult to use as information access and interaction tools in learning, hence there is risk of introducing information access divide based on mobile phone functionality. Even though BYOD has some advantages, institutional policies need to recognise that students from lower income families may need financial assistance in procuring mobile phones with multimedia capabilities.

Students can only use their mobile phones as information access and interaction tools if they are knowledgeable about the features of their devices. The IS student survey results established that even though the students managed to identify most features on their mobile phones, a few students failed to do so. The students failed to identify features, such as a voice recorder, Twitter, Skype, apps download or maps. Students who were not aware of all the features on their mobile phones were assumed not to be fully ready to use their mobile phones. Considering that these were IS students, it can be concluded that most other students could face similar challenges. Therefore, technical support needs to be available on how to fully use the necessary functions of the mobile phones. With regard to student training, the results of policy analysis established that the policies made no reference to providing students with technical training on using the mobile phones in the HEI environment. While the policies did not refer to student training in using mobile phones they supported professional development of lecturers with respect to integrating technology in teaching and learning. This study recommends that institutional policies include mobile training for students.

This study confirmed that the IS students are ready to use their mobile phones for the following activities: information gathering, communication and social connection.

This study considered information gathering as a characteristic of readiness in using mobile phones as an information access and interaction tool. The results confirmed that the IS students have some mobile phone information-gathering skills, for example, searching the Internet. This suggests that if the university provides students with mobile phone services that enable them to gather information, the students should be ready to use such services. Matching the students' information-gathering activities with the institutional policy support, the results of policy analysis established that lecturers are required to design content that is accessible on the web and utilises interactive technologies. This finding confirms that the institutional policies are ready to provide students with mobile-centric information resources.

The communication activities that the students were familiar with included SMS texting, telephone calling, chatting or checking email. The results confirm that the students have some mobile phone communication experience, which implies that they are ready to communicate with other students and their lecturers. Matching communication readiness of students with institutional policy support, policy document analysis established that the university supports mobile phone communication with students. Mobile phone communication is supported by the policies under the pretext of providing equitable communication to students. The university has specific policies that govern communication through telephone, SMS, email and Voice over Internet Protocol (VoIP) services such as Skype. The policies also enforce aspects of ethics and code of conduct when communicating with students. The results confirm that institutional policies are ready to govern mobile communication at the university.

The social connection activities that the students were familiar with included visiting social networking sites, chatting with friends, uploading and viewing pictures. The experience gained when interacting on social media platforms is important in that it improves students' communication and interaction, sharing of content and knowledge, collaboration and virtual presence. Additionally, technologies that are available on social media platforms could enable students to have synchronous peer tutoring and group work. Therefore, the findings of this study provide evidence that the IS students are ready to use their mobile phones for information access, interaction and sharing resources. Matching social media readiness of students with institutional policies support, the results established that the university has some guidelines on how social media should be used in pedagogy. The policies encourage academic and non-academic departments to utilise social media for marketing purposes only. Academic departments are discouraged from distributing copyrighted content on social media as only registered students should have that access privilege. Hence the results confirm that the institutional policies are adequate to govern the utilisation of social media in pedagogy.

The relatively small number of 129 participants is a limitation to the generalisation of this study. Furthermore, the students were all third-year IS students from an ODL university in South Africa. The technical aptitude and mobile devices owned by such students could be different from the rest of the student population at the university. However, as noted, the selection means that the ICT challenges experienced by these students would likely apply to all other students. The policies analysed in this study were from the same ODL university. However, the findings on matching student readiness with policies are generalisable. Despite the identified limitations, the study contributed to the understanding of mobile-centric readiness of students and institutional policies.

## CONCLUSION

This study investigated mobile-centric readiness of a HEI by considering institutional policy support against the case of IS students' readiness at an ODL university in South Africa. Any policy needs to be evaluated in context and that is the value of having considered the policies against the students' mobile-centric readiness. The contribution of the paper lies in identifying the potential mismatches between institutional policies for supporting students in using mobile-centric services and student readiness.

The findings indicate that students' mobile-centric readiness is affected by device ownership, features present on the device and knowledge of using the features. Despite being generally supportive of mobile-centric access, some inadequacies were observed in how institutional policies support the provision of mobile-centric services at the university. For example, when a student does not have a mobile phone or a student has a basic phone with minimum functionality, the BYOD policy has the potential for information access discrimination. Furthermore, the policies do not address the issue of training students on how to use mobile phones as information access tools. Without the required knowledge of mobile phone features, students will not be able to access and interact with the HEI resources. Based on the findings of this study, we recommend that HEIs provide policies supported by best practice frameworks that guide the provision of mobile-centric services. The policies are recommended to at least address issues of infrastructure, resources, mobile technology integration, technical training and support for using mobile-centric information and communication technology.

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