

The provision of mobile centric services in Higher Educational Institutions: A case of lecturer readiness

Baldreck Chipangura
School of Computing, UNISA
South Africa

Judy van Biljon
School of Computing, UNISA
South Africa

Adele Botha
School of computing, UNISA/CSIR
South Africa

Abstract

In South Africa, the potential of mobile phones as tools that facilitates inclusive information access and interaction at Higher Educational Institutions (HEIs) has not been fully realized. A number of factors could be attributed to the slow growth and they include technological factors, economic factors and human factors. This study focuses on human factors as a source of slow growth in providing students with mobile centric services for information access and interaction. The human factors are the focus of this study because lecturers are critical in the provision of mobile centric services in HEI. Hence, the objective of this study is to investigate the factors that could affect the readiness of lecturers in providing mobile centric services that facilitate students' information access and interaction at HEIs in developing countries. The research was undertaken within the Open and Distance Learning (ODL) context in South Africa. Qualitative data was captured by interviewing fourteen lecturers and the data was analysed using the Framework for Qualitative Data Analysis. The findings of the study revealed that lecturers' readiness is affected by their technical skills in designing mobile phone content and services, workload, motivation and access to resources for designing mobile phone content and services. The contribution of this article is to identify the factors that affect the readiness of HEIs lecturers in providing mobile centric services.

Keywords

Mobile phone, information access, communication, interaction, readiness

Introduction

A number of ICT4D pilot projects reported in literature predicted that mobile phones would provide students with inclusive access to information in developing countries (van Rooyen, 2008; Makoe, 2010; Hodgkinson-Williams, & Ng'ambi, 2009; Ford, & Leinonen, 2009; Jantjies, & Joy, 2012). The predictions made by the projects have been partially realized and most students have turned mobile centric in their daily social lives (Goldstuck, 2010; Walton et al., 2012; Brown, & Czerniewicz, 2010; Donner, & Walton, 2013). As a consequence, students who reside in disadvantaged communities have been provided with opportunities for accessing and interacting with information, of which, in the past decade they were never expected to have such an opportunity (Otto, 2011). As mobile phones provide students with inclusive access and interaction to social information, the pressure is mounting at Higher Educational Institutions (HEIs) to provide similar access and interaction to learning resources. The challenge of slow growth in providing mobile phone services at HEIs has become a cause of concern as it could derail the opportunities presented by mobile phones as tools for inclusive information access and interaction. One challenge that has been identified as the cause is the lack of readiness of educators in providing students with mobile phone services for learning (Traxler, 2014; Gounder 2011; Isaacs, Vosloo, & West, 2012; Botha, Batchelor, Traxler, De Waard, & Herselman, 2012). In the same vein, Mori (2011) argued that the concept of digital inclusion demands that workers need to be continually trained on how to provide services through new technologies. Therefore, the provision of mobile centric services would be achieved if the lecturers as the critical human factors at HEIs are technically ready to provide students with the services.

Traxler (2014) argued that among many issues that need to be addressed, educator training takes center stage. Educators need training that prepares them to be ready to provide students with mobile centric services. Gounder (2011) pointed out that if the issue of educator training is not addressed with urgency, the impact of mobile phones in education is not going to be achieved. The lack of educator readiness in providing mobile centric services is a global problem and has been observed in Africa and Middle East countries (Isaacs et al., 2012). Suggestions on addressing this problem are emerging with Isaacs et al. (2012) advocating for training of educators on mobile phone content design, communication and academic administration. This is in line with Botha et al. (2012) who proposed for the implementation of a mobile learning curriculum, whose objective is to train and guide educators in designing mobile phone services for learning and administration.

Even though there is a general lack of readiness in providing mobile centric services globally, there are some projects that have been reported in Africa and Middle East (Isaacs et al., 2012), North American (Fritschi et al., 2012) and Europe (Dykes, & Knight 2012), which provide guidance on how to prepare educators for the provision of mobile centric services for teaching and learning. In Europe, Dykes and Knight (2012) reported on projects that demonstrated the integration of m-learning curriculum into educators' professional development courses. The philosophical approach used in Europe was to teach the educators by example with the hope that they would transfer the knowledge gained to teach their students. The curriculums were designed to teach the educators on how to incorporate mobile technologies into their curriculum, design lessons and mobile

learning activities, and to come up with strategies for communication and interaction. On the other hand, the North American curriculum trained educators to be critical with the ability to determine when the use of mobile phones adds value to student teaching (Fritschi et al., 2012).

The readiness of educators in providing mobile centric services that facilitate students' access and interaction is known as e-readiness (Machado, 2007), and has been defined as, "the ability of HEIs and the capacity of institutional stakeholders (managers, key ICT persons, teachers and students) to generate e-Learning opportunities by facilitating computer-based technologies" (Machado, 2007:74). The definition of e-readiness points out that one of the important measures of e-readiness is the capacity of stakeholders in providing electronic resources. Human resources readiness has been identified as an important dimension among numerous models for assessing the e-readiness of various organizations (Machado, 2007; Aydın, & Tasci 2005; Rosenberg 2001; Darab, & Montazer 2011). This study is concerned with the readiness of the lecturers in providing students with mobile phone services in HEIs. Hence, the objective of this research is to investigate the factors that affect the readiness of lecturers in providing mobile centric services that facilitate students' information access and interaction at HEIs in developing countries. The research question that guided this research was: *What are the factors that affect the readiness of lecturers in providing mobile centric services that facilitate students' information access and interaction at HEIs?*

Research Methodology

This section presents the research philosophy, research strategy, and the techniques that were used to collect and to analyse the data.

Research philosophy

The underlying philosophical assumption of this study is interpretivism and "its ontological position suggests that people's understanding, interpretation, experiences and interaction are meaningful properties of social reality" (Mason, 2002:63). This could be achieved through qualitative interviews. Kvale and Steinar (1996) argued that through conversations other people can get to understand the lives of other people, their experiences, feelings, and how they see the world that they live in. In this study, it is important to understand the perceptions of lecturers on the factors that affect their readiness in providing students with mobile centric services for information access and interaction at HEIs. The following section discusses participants sampling.

Participants

Fourteen lecturers from the School of Computing at an ODL university in South Africa participated in the interviews between October and December 2013. The demographic ratios of the interviewed participants were six females and nine males. Their ages ranged from twenty-eight years to sixty years. The proportions and the job ranks of the interviewed participants were five lecturers, six senior lecturers and three professors.

The lecturers who participated in the interviews were sampled using maximal variation sampling technique. Maximal variation sampling is a subset of purposeful sampling (Patton 1980). Purposeful sampling is a technique where researchers intentionally select

participants who have experienced the central phenomenon or the key concepts being explored (Creswell, & Plano, 2011). Maximal variation sampling aims at recording different occurrences within a small sample to be studied extensively (Rubin, & Babbie, 2008). The following section discusses data collection.

Data collection

The participants were invited to participate in the interviews through emails and in person. Most of the interviews took place in the offices of the lecturers except three interviews, which took place at a Computer Science and Information Systems conference in September 2013. All the participants signed consent forms and the interviews were audio recorded and later transcribed.

A script with seven open ended questions guided the interviews and all the participants responded to the same questions. The design of the interview questions were based on the Conceptual Framework for the Provision of Mobile Centric Information Access and Interaction at HEIs (Chipangura, 2013). This study reports on the findings of the seven open ended interview question. The interview questions were:

- Do you think you are ready to provide students with mobile phone services that facilitate information access and interaction?
- Is there anything that may be stopping you from providing the mobile phone services?
- Do you have the technical skills required to provide mobile phone services?
- Do you have interest in providing mobile phone services?
- Do you have some disposable time for providing mobile phone services?
- How is the management supporting the provision of mobile phone services at the university?
- Are there any resources that are provided by the university that facilitate you with the provision of mobile phone services?

The following section discusses the data analysis method used in this research.

Data analysis method

This study used the Framework Analysis method (Ritchie, & Spencer, 1994) to analyse the data and structure the results. The advantage of the Framework Analysis method is that it is inductive and has systematic stages of analysing the data. The stages are familiarization, identifying a thematic framework, indexing, charting, mapping and interpretation. The following sections present the results that came from the lecturer interview analysis.

Results

This section presents the data analysis results of the lecturer interviews data set. The objective of the data analysis was to investigate the factors that could affect the readiness of lecturers when providing mobile centric services that facilitate students' access and interaction. The data analysis results revealed six main themes of factors and they are lecturer training, competency, motivation, workload, leadership and resources awareness. Table 1 at the end of this section summarizes the results and the following sections present the results.

Lecturer training

The results showed that most of the lecturer participants need training on how to provide students with mobile phone services that facilitate information access and interaction. Lecturer training is an important factor because the provision of mobile centric services at HEIs is still new and has never been implemented at a large scale before. The lecturers indicated that they need training on content design, communication, and interaction. In this regard participant P5 said,

“With things like simulation, you really need training. I know that there was once podcasting training, a few colleagues attended it, one of them is [lecturer’s name], like how to pose, articulate and i am not sure if other lecturers had time for that.”

Even though the lecturer participants indicated that they needed training on how to provide mobile phone services, there were lecturers who indicated that they taught themselves how to provide mobile services to students and they were already doing so. In this regard lecturer participant P6 said,

“.....That is the only thing that i attended where people specifically discussed how they used tablet PCs and some even demonstrated how they use them for teaching. I was excited by that. Otherwise, from the formal university trainings that I attended nothing of that sort was discussed.”

Contrary to the general consensus that the lecturers needed training, a few of the lecturers indicated that they were not eager to learn how to provide students with mobile services. The participants indicated that they were aware that the university has the capacity to offer such trainings because it is already offering e-learning trainings to lecturers but where not interested. Participant P11 said,

“I know there are trainings like Pathfinder, VLEs, it’s only me being lazy or not looking for trainings for designing online material for mobile phones or something like that. I know that they fully support the online delivery.”

This section established that most of the lecturer participants seem not to be ready to provide students with mobile phone services as they required training. There were also some lecturers who indicated that they were not interested in providing students with mobile phone services.

Technical expertise

The results showed that most of the lecturer participants (78%) perceived themselves as not having the necessary skills that enable them to provide students with mobile centric services that facilitate information access and interaction. Due to the perceived lack of skills, the lecturers said that they would prefer to approach the provision of mobile phone services as part of a team. Lecturer participants P5 and P6 argued that such a team should include competent specialist assigned to specific tasks. The specialist may include the lecturers as content providers, curriculum designers as instructional designers and IT specialist as mobile applications designer. In this regard, lecturer participant P11 pointed out that the university has Open Educational Resources (OER) specialists and they should help with identifying resources for the provision of mobile phone content and services.

Participant P11 said,

“There are OER experts who are helping people to design for online learning, i think they can help with designing for mobile access.”

In trying to determine the knowledge and skills that the lecturer participants currently possess, it came out that some of the lecturer participants were already using their knowledge in providing students with mobile phone resources. Lecturer participants P5, P7 and P10 confirmed that they provide students with podcast/vodcasts they create themselves or which they get from OER. The participants also reported that they use discussion forums for interaction and SMS for communication. Participant P5 said, "I incorporate mobile tools, not in the design stage of my learning study material but in the process of delivering learning content. I use mobile phones as a notice board, making students aware of what is on the LMS, or on discussion forums. It helps with quick interactions because it alerts students even when in a club that they have new learning material on the LMS, for example lecture slides."

Since all the participants were lecturers, they confirmed that they were competent in curriculum and instructional design and they would not expect to have difficulties in designing mobile phone content and services if they receive some training. Lecturer participant P1 said, "Lecturers would not have troubles in designing for mobile information access and interaction because they would still develop study material the same way they are doing for online learning."

This section established that the lecturer participants perceived themselves as not competent enough to provide students with mobile phone services. The lecturers would need help from specialist such as IT specialist, and Educational technologist.

Motivation

The results showed that some of the lecturer participants were interested in providing students with mobile centric services that facilitate information access and interaction and some were not. The interested lecturer participants P6, P9, P11 and P14 expressed that even though they have not started providing mobile phone content and services, they were willing to research and learn on how to do that. The lecturer participants indicated that they have interest in attending training on how to design mobile phone content and services. The lecturers were keen to learn because they intended to research on mobile phone technology in learning. Lecturer participant P6 reported that some lecturers formed a focus group that is interested on the use of mobile tools in learning. Lecturer participant P6 said, "Lecturers who are interested in mobile phone information access and interaction formed an informal group to look at that and I attended one of them and found it interesting. I was excited by that."

Lecturer participants P5 and P10 indicated that their motivation for providing students with mobile phone content and services was as a result of sympathy for students who primarily access information through mobile phones when at home. Lecturer participant P5 indicated that he innovatively incorporate mobile phone tools in the delivery stage of the study material.

There were some lecturer participants who had negative attitudes because they were of the opinion that the provision of mobile phone services to students would add extra work on their workload. Lecturer participant P8 said, "For me, if I deliver the content whether they use a personal computer or a tablet, or a mobile phone, it doesn't concern my business; I can't cater for all 3 of those."

Lecturer participant P3 said,

“Before you go ahead, let me say that I am not interested because I have something else to do as well, I am not just sitting the whole day, you know that, so if I say I don’t have interest, it’s because I don’t think the time is right.”

There were some lecturer participants who felt that they could not do anything extra that is not supported by the policy. Participant P6 said,

“If you do something beyond the given standards at the university, you must make sure that every student should have access to that, otherwise you will be accused of unfair practice. I stick to the given standards; there is nothing that I specifically design for mobile phones’ access and interaction.”

This section established that some lecturers are interested and some are not. The motivated lecturers are eager to learn and they have been putting effort in teaching themselves how to provide mobile phone services. Lecturers who are not interested think that providing students with mobile phone services would add extra work to them.

Workload

Majority of the lecturer participants pointed out that they had a huge workload that discourages them from providing students with mobile phones services. Lecturer participants P1, P2, P3, P5, P6, P9, P10, P11 and 12 reported that apart from tuition duties, lecturers were expected to perform other duties such as community engagement and academic citizenship. Non-academic duties leave lecturers with not enough time to properly perform their teaching duties. In this regard, lecturer participant P1 said, “It would be a problem if the university expects the lecturers to do everything; we do not have time on our side. Other than tuition, lecturers are expected to do research, community engagements and academic citizenship. They cannot do everything, they can’t.”

Lecturer participant P1 seemed to imply that when the university engages in a project for providing mobile phone content and services, it should clearly specify the duties of the interested stakeholders. In this case, some of the stakeholders includes IT specialist, educational technologist, and instructional designers. In this regard, participant P2 said, “The assumption is that lecturers should only focus on tuition matters and should not be responsible for how students would access information, they can do that in several ways, including mobile devices. It is the responsibility of the IT department to provide an LMS that can format data for mobile access.”

Notably, there is evidence in this study that teaching large classes at the university increases the workload of the lecturers. As a consequence, lecturers would be left with little time to research and experiment with new teaching technologies. In this regard, Participant P7 reported that she manages a large class of up to 1500 students alone and due to time demand, she just do minimum work. Participant P7 said, “I am totally alone for 1500 students, I am lecturing, and designing for next year and I am on my own. I have to keep up with technology; there is something that I have to give up.”

This section established that if the lecturers are overloaded with work and have big job descriptions, they end up doing minimum work in everything. Work overload was found to discourage lecturers from being innovative in their teaching especially with experimenting

with new technologies.

Leadership

The lecturer participants could not directly respond to the question with respect to support from management but gave views on what they thought the management should do. The lecturer participants were of the view that academic management should have interest and knowledge of the merits of providing students with mobile phone services. They recommended that leadership ought to be implemented through promoting mobile phone services, motivating lecturers, managing lecturer workload, providing infrastructure, policies and implementation strategy. Lecturer participant P11 said, "Lecturers should get incentives for using mobile phone platform and also give them resources to be on a mobile platform. Right now i can't be using my own cell phone and data, which is very expensive to get hold of students."

These findings indicate that successful provision of mobile phone services at HEIs depends on visionary academic leadership. The participants expected management to provide lecturers with resources, motivation and manage their workload towards making time for mobile centric development.

Awareness

The results of this study showed that some of the lecturer participants were aware and some not aware of mobile phone resources provided by the university. Lecturer participants P5 and P9 admitted that they were not aware of any resources that could assist with designing mobile phone content and services. The lecturer participants indicated that it is difficult to know all the functionalities of the Learning Management System (LMS) used at the university but were interested in exploring it further. In contrast, lecturer participant P3 expressed no interest in providing mobile phone services, and would not put effort in finding available resources for that.

Lecturer participants P1, P2, P6, P10 and P11 were aware of the SMS service and had used the service for communicating with students more than once. Lecturer participants P10 and P11 observed that it would be difficult for the lecturers to know some of the available mobile phone resources because they are not well marketed. Lecture participant P11 said,

" I am not sure of their name. I know there is a department that is in the fourth floor of TVW building, which gives such services, but the only problem is that these people are not really out there to market themselves so that they can give such services. You have to look for such services yourself."

This section established that mobile phone resources awareness was affected by lecturers' ignorance of technological advancements, negative attitude or the resources were not marketed to the lecturers.

Discussion

This research investigated the factors that affect the readiness of lectures when providing students with inclusive mobile centric services that facilitate information access and interaction. The context of the study is higher educational institutions (HEIs) in developing countries. The factors that affect the readiness of lecturers were identified as *lecturer*

training, competency, motivation, workload, leadership and resource awareness. Table 1 recaps the results of this study.

Factors that affect readiness	Findings
Training	Lecturers are not ready to provide mobile centric services.
Technical expertise	Lecturers have no expert knowledge in programming, designing curriculum for mobile phone content and identifying mobile applications that facilitate interaction with students. Lecturers would need expert support from IT specialist, educational technologist and curriculum designers.
Motivation	Motivated lecturers are eager to learn and research on the provision of mobile centric services. Lecturers' negative attitudes were due to the assumption that that providing mobile centric services would increase their workload. Lecturers could be motivated by teaching them the benefits of providing mobile centric services and giving them incentives.
Workload	Lecturers are overloaded with work and that discourages them from providing mobile centric services. The workload prevents lecturers from learning and experimenting with new technologies for teaching and learning.
Leadership	University management is expected to prioritise the provision of mobile centric services at the university by providing resources, motivating lecturers and marketing the services.
Awareness	Some lecturers are aware of mobile centric resources and others are not. Lecturers' awareness is affected by ignorance of technological advancements and negative attitude.

Table 1: Factors that affect the provision of mobile centric services

This study found that lecturers need training on how to provide mobile centric services that facilitate students' information access and interaction at HEIs. Certainly, this is a challenge in developing countries and if lecturers are not properly trained, they would find it difficult to provide mobile centric services. This finding supports Steyn (2011) who posits that development should start at individual level, and then it escalates to social development and it would translate into economic development. Failing to provide mobile centric services at HEIs would jeopardize the opportunities presented by mobile phones as tools that can provide universal access to information especially in education. Furthermore, the UNESCO's 2015 goal of reaching the disadvantaged and vulnerable in education would be threatened (UNESCO, 2008) because mobile phones are the only accessible information access tools for disadvantaged communities.

Learning from the UNESCO series of publications (Isaacs et al., 2012; Fritschi et al., 2012; Dykes, & Knight, 2012), educators should be trained on how to provide mobile phone services when they are still at educational training colleges, otherwise training could be provided through professional development courses. As suggested by Botha et al. (2012), the training for the provision of mobile phone services should be integrated into the educators' training curriculum. If the lecturers are trained, the chances would be high that they would provide mobile phone services to their students when teaching.

The insights gained in this research indicated that lecturers do not perceive themselves as competent to provide mobile centric services. The participants perceived themselves as not having the necessary skills because they regarded the provision of mobile phone services as their individual responsibility. The provision of mobile phone services at HEIs is a big task and it is advisable that the implementation be done as team work. The members of the team could include specialist such as IT specialist, Educational technologist, Curriculum designers and Lecturers. The specialist would provide the lecturers with the

necessary support when providing students with services for mobile phone access and interaction.

This study identified motivation of lecturers as a factor that could affect the provision of mobile phone services, which is also true in previous studies in m-learning (Gloria, & Abimbade, 2013; Ekamayake, & Wishart, 2011; Ozdamli, & Uzunboylu, 2014; Cheon et al., 2012). Motivation is concerned with factors that stimulate the desire and energy of lecturers to commit in providing students with mobile centric services. Lecturers would become motivated if the provision of mobile centric is enjoyable (Davis et al., 1992), valuable and they can associate the activity with their teaching goals (Chiu, & Wang, 2008). In order to motivate lecturers in providing mobile phones services, it is advisable that the university advocates for the provision of mobile centric services. The advocacy may include lecturer training, providing technical support and awarding lecturers for good work.

The workload of lecturers was identified as a factor that could affect the readiness of lecturers in providing mobile centric services. There is high likely wood that if the workload of the lecturers is not well managed they would resist providing students with mobile phone services that facilitate information access and interaction for learning. This is in line with previous research which found that lecturers could resist m-learning because they see the preparation of m-learning material as extra workload, which is time consuming (Mohamad, 2012; Sridharan, 2013). The issue of workload is evident in pilot studies that were reported in literature where the researchers were the only human resources supporting the projects (van Rooyen, 2008; Makoe, 2010; Ng'ambi, 2006; Rambe, & Bere, 2013). Rambe and Bere (2013) reported that they had to sacrifice long hours interacting with students otherwise the projects were going to fail.

The insights gained in this study indicate that the readiness of lecturers in providing mobile phones depends on the academic leadership of the university. Given the compelling relevance of providing students with mobile centric access to services, it is advisable that academic leadership prioritise the provision of mobile phone services. This could be achieved by promoting the product, motivating lecturers, providing infrastructure, policies and implementation strategy. These findings support the work of (Searson et al., 2011; Hinostrroza, & Brun, 2012).

Experiences gained from this case study have shown that even though the university has some resources for the provision of mobile phone services there were lecturers who were not aware of their existence. It was established that lack of awareness could be as a result of ignorance of technological advancement, negative attitude or lack of interest by the lecturers.

Limitations of the study

This study is limited by the small sample of lecturer participants who took part in this study. All the lecturers were from the School of Computing at an ODL university in South Africa. The technological aptitude of Computer Science lecturers could be different from the rest of other lecturers from different faculties at the university and could have influenced the identified factors. Hence, more research is needed to generalise this finding. The study

could be extended to the whole university or other universities, creating room for identifying other factors that could affect the readiness of lecturers in providing mobile centric services that facilitate students' access and interaction in HEIs in developing countries. Even though some of the lecturer participants in this study indicated that they have some experience with providing mobile phone services, some were never exposed to such services. Hence, future research should also focus on the insights of the lecturers after they have been exposed to the provision of mobile phone services first.

Conclusion

This study investigated human factors that affect the provision of mobile centric services in HEIs with particular focus on the readiness of lecturers. This study identified the factors that affect the readiness of lecturers in providing mobile centric services as lecturer's training, technical expertise, motivation, workload, leadership, and resources awareness. Some of the factors have been identified in previous research and they include lecturer training, competency and motivation (Traxler, 2014; Grounder, 2011; Isaacs at al., 2012). Hence, this study adds workload, resources awareness and leadership as factors that could affect the readiness of lecturers when providing inclusive and sustainable mobile centric services at HIEs in developing countries.

References

- AYDIN, C.H. & TASCI, D., (2005). Measuring readiness for e-learning: reflections from an emerging country. *Educational Technology and Society*, **8**(4), pp. 244-257.
- BROWN, C. & CZERNIEWICZ, L., (2010). Debunking the 'digital native': beyond digital apartheid, towards digital democracy. *Journal of Computer Assisted Learning*, **26**(5), pp. 357-369.
- BROWN, T., (2003). The role of m-learning in the future of e-learning in Africa, *21st ICDE World Conference*. Retrieved from http://www.tml.tkk.fi/Opinnot/T_2003, on 5 May 2014.
- BUTGEREIT, L., (2007). Math on MXit: using MXit as a medium for mathematics education, *Meraka INNOVATE Conference for Educators*, 18-20 April 2007, CSIR Meraka, pp. 1-13.
- CHEON, J., LEE, S., CROOKS, S.M. & SONG, J., (2012). An investigation of mobile learning readiness in higher education based on the theory of planned behavior. *Computers & Education*, **59**(3), pp. 1054-1064.
- Chipangura, B. (2013). Categorizing the provision of mobile centric information access and interaction for higher educational institutions. In Proceedings of the South African Institute for Computer Scientists and Information Technologists Conference (pp. 101-110). ACM.
- CHIU, C.& WANG, E.T., (2008). Understanding Web-based learning continuance intention: The role of subjective task value. *Information & Management*, **45**(3), pp. 194-201.
- CRESWELL, J.W. & PLANO, V.L., (2011). *Designing and Conducting Mixed Methods Research*. 2rd Edition edn. London, United Kingdom: Sage.

- DAVIS, F.D., BAGOZZI, R.P. & WARSHAW, P.R., (1992). Extrinsic and intrinsic motivation to use computers in the workplace¹. *Journal of Applied Social Psychology*, **22**(14), pp. 1111-1132.
- DARAB, B. & MONTAZER, G.A., (2011). An eclectic model for assessing e-learning readiness in the Iranian universities. *Computers & Education*, **56**(3), pp. 900-910.
- DONNER, J. & WALTON, M., (2013). Your phone has internet-why are you at a library PC? Re-imagining public access in the mobile internet era. *Human-Computer Interaction-INTERACT 2013*. Springer, pp. 347-364.
- DYKES, G. & KNIGHT, H., (2012). *Mobile Learning for Teachers in Europe: Exploring the Potential of Mobile Technologies to Support Teachers and Improve Practice*, UNESCO 2012. Retrieved from <http://unesdoc.unesco.org/images/0021/002161/216167e.pdf>, on 5 May 2014.
- EKAMAYAKE, Y. & WISHART, J., (2011). Investigating the possibility of using mobile phones for science Teaching and Learning: is it a viable option for Srilanka. *International Journal for Cross-Disciplinary Subjects in Education (IJCDSE)*, **2**(2), pp. 372-380.
- FORD, M. & BOTHA, A., (2009). MobiLED: mobile-led and leading via mobile, Retrieved from <http://hdl.handle.net/10204/3560>, on 14 May 2014.
- FORD, M. & BOTHA, A., (2007). MobilED—an accessible mobile learning platform for Africa, *IST-Africa 2007 Conference, Maputo Mozambique 2007*, IST-Africa 2007, pp. 9-11.
- FORD, M. & LEINONEN, T., (2009). MobilED—a mobile tools and services platform for formal and informal learning pp195, in *Mobile Learning: Transforming the Delivery of Education and Training*, *Mobile Learning*, edited by Ally, AU Press, Athabasca.
- FRITSCHI, J., WOLF, M.A., NAKASHIMA, D., GALLOWAY MCLEAN, K., THULSTRUP, H., RAMOS CASTILLO, A., RUBIS, J., ISAACS, S. & ENGIDA, T., (2012). Mobile learning for teachers in North America: exploring the potential of mobile technologies to support teachers and improve practice, UNESCO 2012. Retrieved from <http://unesdoc.unesco.org/images/0021/002160/216081e.pdf>, on 14 May 2014.
- GLORIA, A. & ABIMBADE, O., (2013). Teachers' Awareness and Readiness for Using Mobile Phones as Support and Tutorial tool in Teaching, *Society for Information Technology & Teacher Education International Conference 2013*, pp. 3718-3724.
- GOLDSTUCK, A., (2010). The mobile internet pinned down. *World Wide Worx Blog*, Retrieved from <http://www.worldwideworx.com/the-mobile-internet-pinned-down/>, on 14 May 2014.
- GREGSON, J. & JORDAAN, D., (2009). Exploring the challenges and opportunities of m-learning within an international distance education programme. *Mobile Learning*, , pp. 215.

- HINOSTROZA, J.E. & BRUN, M., (2012). ICT IN EDUCATION POLICY AND PRACTICE IN CHILE: DOES IT CORRELATE? *Fourth IEA International Research Conference (IRC 2010)*. Retrieved from http://www.iea.nl/fileadmin/user_upload/IRC/IRC_2010/Papers/IRC2010_Hinostroza_Brun.pdf, on 14 May 2014.
- ISAACS, S., VOSLOO, S. & WEST, M., (2012). Mobile learning for teachers in Africa and the Middle East: exploring the potential of mobile technologies to support teachers and improve practice, UNESCO 2012. Retrieved from <http://unesdoc.unesco.org/images/0021/002163/216358e.pdf>, on 14 May 2014.
- JANTJIES, M. & JOY, M., (2012). Multilingual Mobile Learning-A Case Study of Four South African High Schools, *1th World Conference on Mobile and Contextual Learning (mLearn 2012)*, 16-18 Oct 2012, mLearn, pp. 1-4.
- KVALE, S., (1996). *InterViews. An introduction to qualitative research writing*, Sage Publishers, Thousand Oaks.
- MACHADO, C., (2007). Developing an e-readiness model for higher education institutions: results of a focus group study. *British journal of educational technology*, **38**(1), pp. 72-82.
- MAKOE, M., (2010). Exploring the potential for Mxit- a cellphone instant messaging system in supporting distance learners. *The Journal of Open, Distance and e-Learning*, **25**(3), pp. 251-257.
- MASON, J., (2002). *Qualitative researching*. SAGE Publications Limited.
- MATTHEE, M. & LIEBENBERG, J., (2007). Mathematics on the move: Supporting mathematics learners through mobile technology in South Africa, *2007 MLearn Conference*. Retrieved from http://www.mlearn2007.org/files/mLearn_2007_Conference_Proceedings.pdf 2007, on 14 May 2014.
- MOHAMAD, M., (2012). ISSUES and challenges in implementing mobile learning in malaysian schools, In, *6th International Technology, Education and Development Conference* , Valencia de Alcántara, ES, 05 - 07 Mar 2012.
- MORI, C.K., (2010). 'Digital Inclusion': Are We All Talking about the Same Thing, in *ICTs and Sustainable Solutions for the Digital Divide: Theory and Perspectives*, edited by Steyn and Johanson , IGI global, pp. 45-64.
- NG'AMBI, D., (2006). Collaborative Questioning: A case of Short Message Services (SMS) for knowledge sharing, *Advanced Learning Technologies, 2006. Sixth International Conference on 2006*, IEEE, pp. 350-351.
- OGUNLEYE, S., BOTHA, A., FORD, M., TOLMAY, J. & KRAUSE, C., (2009). Igloo: mobile learning system to facilitate and support learners and educators, Retrieved from <http://hdl.handle.net/10204/3974>, on 14 May 2014.

- OTTO, L., (2011). Bringing development to Africa: How the mobile phone industry is helping. *Consultancy Africa Intelligence*, **2**.
- OZDAMLI, F. & UZUNBOYLU, H., (2014). M-learning adequacy and perceptions of students and teachers in secondary schools. *British Journal of Educational Technology*, Wiley Online Library, Retrieved from, <http://onlinelibrary.wiley.com/doi/10.1111/bjet.12136/pdf>, on 14 May 2014.
- PATTON, M.Q., (1980). *Qualitative Evaluation methods*. 2nd edn. Beverly Hills London: Sage Publications.
- RAMBE, P. & BERE, A., (2013). Using mobile instant messaging to leverage learner participation and transform pedagogy at a South African University of Technology. *British Journal of Educational Technology*, **44**(4), pp. 544-561.
- RENKEN, J. & HEEKS, R., (2013). Conceptualising ICT4D project champions, *Proceedings of the Sixth International Conference on Information and Communications Technologies and Development: Notes-Volume 2 2013*, ACM, pp. 128-131.
- RITCHIE, J. & SPENCER, L., (1994). Qualitative data analysis for applied policy research. In A. Bryman & R.G. Burgess (Eds.), *Analyzing qualitative data* (pp. 173-194).
- ROSENBERG, M.J., (2001). *E-learning: Strategies for delivering knowledge in the digital age*. New York: McGraw-Hill.
- RUBIN, A. & BABBIE, E.R., (2008). *Research methods for social work*. Thomson Brooks/Cole.
- SEARSON, M., LAFERRIERE, T. & NIKOLOV, R., (2011). Barriers to Successful Implementation of Technology Integration in Educational Settings. *Communication présentée au EduSumMIT, Paris*. Récupéré de: Retrieved from <http://edusummit.nl/res2011/calltoaction2011/briefpapers2011>, on 14 May 2014
School Net South Africa 2011, Retrieved from http://www.schoolnet.org.za/reports/1108_nokia.pdf, on 14 May 2014.
- SRIDHARAN, V., (2013). An Analysis of Socio-Technical Factors in Implementing Mobile Learning Solution at an Educational Institution: A Case Study of Mid-Tier MBA College in India. *QScience Proceedings*, (12th World Conference on Mobile and Contextual Learning [mLearn 2013]).
- STEYN, J., (2011). Paradigm shift required for ICT4D. *ICTs and Sustainable Solutions for the Digital Divide: Theory and Perspectives*, edited by Steyn and Johanson, IGI global, **19**.
- UNESCO, E. (2007). Global Monitoring Report 2008: Education for All by 2015. Will We Make It, Retrieved from <http://unesdoc.unesco.org/images/0015/001548/154820e.pdf>, on 14 May 2014.

VAN ROOYEN, A., (2008). Integrating mobile technology into a distance education accounting module, *Proceedings of the 3rd International Conference on e-Learning 2008*, Academic Conferences Limited, pp. 475.

WALTON, M., MARSDEN, G., HABREITER, S. & ALLEN, S., 2012. Degrees of sharing: Proximate media sharing and messaging by young people in Khayelitsha, *Proceedings of the 14th international conference on Human-computer interaction with mobile devices and services 2012*, ACM, pp. 403-412.