Chapter 58
Teaching Through Mobile Technology:
A Reflection From High School Studies in South Africa

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ABSTRACT

The use of mobile technology to support teaching and learning in schools, has extended technology learning tools in schools across different socio economic divides. There have been various studies throughout the world which reflect the improvement of such technology in schools. In this chapter we reflect on a series of studies conducted in developing countries with focus on Jantjies and Joy (2012, 2013, 2014, 2015) studies. The studies were conducted in schools with the objective of providing teachers and learners with multilingual mobile learning content specifically designed to support teaching and learning in their science and mathematics classrooms and beyond. This chapter provides a culmination of lessons learnt from all studies reflecting on the journey of mobile learning in schools across South Africa. The use of mobile technology to support teaching and learning in schools, has extended technology learning tools in schools across different socio economic divides. There have been various studies throughout the world which reflect the improvement of such technology in schools. In this chapter we reflect on a series of studies conducted in developing countries. The studies were conducted in schools with the objective of providing teachers and learners with multilingual mobile learning content specifically designed to support teaching and learning in their science and mathematics classrooms and beyond. This chapter provides a culmination of lessons learnt from all studies reflecting on the journey of mobile learning in schools across South Africa.

INTRODUCTION

This chapter presents two mobile learning studies conducted in mathematics and science classrooms in South Africa. The study looks at how mobile technology was used to support the process of teaching and learning in these subject areas, whilst considering the language barriers and the context.

The premise of these studies was motivated by the annual increase of mobile phone access and Internet access (ITU, 2015), and the use of mobile phones as learning platforms in situations where other e-learning platforms are not easily accessible. While research studies have advanced our knowledge about the platforms used to support teaching and learning, such as tablet devices in many schools, the instructional design and implementation challenges relating to mobile learning across different countries and contexts still require further research (Jaffer, Ng'ambi & Czerniewicz, 2007; UNESCO, 2012a; UNESCO, 2012b).

There is thus a need for different scenarios of mobile learning use in schools to provide various views of how we can improve mobile led design and instruction. In recognising that use of technology in schools depends on the teachers and learners, this chapter also presents the skills and contextual offerings which influence the use of mobile devices in the schools being studied. Research has highlighted the various challenges that teachers face when unable to integrate technology into their teaching process. This could be as a result of many factors, such as lack of ICT skills and support infrastructure (Bitner and Bitner, 2002; Roth, 2014), and there is thus a need to reflect on studies in different contexts.

The development of mobile learning to support high school/K12 education has seen various advancements across the world. In this chapter we provide a reflection on studies conducted in several schools with the objective of supporting teaching and learning in science and mathematics classrooms. In each study mobile applications were developed with education experts and teachers and the applications were used to support learning inside and outside the classroom learning context. Furthermore, learners were provided with mobile phones loaded with airtime/data which allowed them to access the learning content on their phones. The teachers would then provide various tasks which required the use of this technology when learning inside and outside the classroom. The content was also presented in multiple South African languages, as suggested by the multilingual context of the studies.

The chapter presents the challenges in the study and lessons learnt from conducting mobile learning research in a developing country context. While some of the lessons are context specific, such as the multilingual nature of the country, there are various elements of the research which resonate with the use of education technology to support teaching and learning across the world. These reflections can thus benefit teachers and researchers on how to best to develop and use mobile driven instructional design in schools.

MOBILE LEARNING IN SOUTH AFRICA

One of the earliest mobile learning project in South Africa was the MELFA project which was aimed at providing building construction workers with training content through voice recorded multilingual learning content (MELFA, 2009).

Dr Maths was later developed by a South African research institution, CSIR, which aimed to provide a real time tutoring platform for mathematics. In conjunction with a local university, learners in high

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