



## An investigation into the use of emerging technologies to transform teaching and learning across differently positioned higher education institutions in South Africa<sup>2</sup>

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This paper reports on a project which was initiated in 2011 and which aims to learn more about emerging technologies in higher education in South Africa and their potential impact on enhancing learning in an inequitable educational landscape. This newly developed research project includes a team of researchers across eight differently placed South African HEIs and one international NGO (see footnote 1 for researchers in the team and their institutional affiliations). The paper elaborates on emerging technologies, the South African context, provides an overview of the rationale for the project and describes the research design for the project.

**Keywords:** Emerging Technologies, South African HEIs, transforming teaching and learning,

### Introduction

This paper reports on a project which focuses specifically on *emerging technologies* which are being used in South African Higher Education to improve teaching and learning. Emerging technologies are defined as those technologies which are 'likely to have a large impact on teaching, learning, or creative inquiry on college and university campuses within the next five years' (Johnson et al. 2011, p.3). or those technologies which are on the rise (Johnson & Adams, 2011). According to The Technology Outlook for UK Tertiary Education 2011-

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2016 Report by the New Media Consortium and JISC support centres in the UK, mobiles are likely to become used in mainstream educational settings globally, with cloud computing also becoming prevalent in the next year and game-based learning coming into prominence in the next two to three years. All three of these technologies are seen to have the potential to disrupt what is current teaching and learning practice in higher education institutions (HEIs).

### **Contextualisation of the project**

The question of how to make higher education more inclusive has been a central concern internationally over the past two decades (Drakich, Taylor & Bankier, 1995). South African post-apartheid policy documents on education reflect this same concern, embracing values such as democracy, openness and a human rights approach to education (Department of Education, 2001). Despite these policy intentions, however, the South African higher education landscape is still affected by the historical inequities of past policies, and many students and Higher Education Institutions (HEIs), particularly the Historically Disadvantaged Institutions (HDIs) are affected by scarce resources, poverty and students' inadequate preparation for higher education as a result of inequities in the general education system in South Africa (MacDonald, 2006, Scott, Yeld & Hendry, 2009). Higher educators world-wide also tend to fall back on outmoded transmission practices in their teaching, which are out of sync with the informal learning experiences of students (Ramsden, 2011). Emerging technologies, if used appropriately, have been shown to enhance communication and critical thinking skills, develop lifelong learning behaviour and facilitate student engagement in ways that promote a deeper understanding of coursework (Henard, 2009). In addition to improving teaching and learning practices, providing access to the vast resources that are freely available online may benefit students who lack access to traditional forms of content e.g. textbooks.

This study is intended to contribute to a national understanding of what emerging technologies might contribute to the quality of teaching and learning in South Africa. More particularly this study focuses on how emerging technologies can be used for transforming teaching and learning interactions and paradigms in a diversity of Higher Education contexts, including resource-scarce situations.

### **Emerging technologies and social inclusion**

Emerging technologies can be used in innovative ways to address issues of inequity and social exclusion. These emerging technologies could be used to create seamless and safe embedded interactive learning spaces across diverse contexts (Davidson & Goldberg, 2009; DeViney & Lewis, 2006; Hakkarainen, 2009; Henschke, 2010; Looi, 2010; Sharples et. al., 2007; Traxler, 2009).

Traxler (2009) observes that less privileged individuals are able to access information of their choice using their own devices without needing to accept constraints and conditions historically imposed on them. The use of their own devices or ubiquitous technologies has the potential to improve educators' interaction with learners, learners interaction with content, and learners interaction with peers. Leveraging technologies that are available to people with emerging social practices enabled by technologies thus have the potential to bring about qualitative outcomes to education. The affordances of such integration are the blending of informal with formal learning. To the extent that blended learning could be viewed as empowering learners by widening access to education, the integration of blended and mobile learning has the potential to both widen access and enhance the learning experience. According to Van 'T Hooft (2009), mobility expands learning across space and time and opens many opportunities for learning that is neither sequential nor consistent.

Podcasts, blogs and e-books have been shown to be useful in resource-constrained contexts. Podcasts are seen as particularly useful because of their relative low cost and ease of use - Salmon and Nie (2008, p.3) refer to this as 'a high-value, low cost approach'. This is useful for students who come from impoverished

backgrounds and who are not able to afford sophisticated electronic equipment. Many students however, do have access to mobile phones which also function as MP3 players. Salmon & Nie (2008, p. 5) have noted that the 'human and personal features of voices can convey to listener's a richer understanding'. Ng'ambi (2008; 2009) has noted how podcasts have been effective particularly for expansive learning with second-language students.

Blogs have also been successfully used in education to enhance and deepen learning and develop writing capabilities (Williamson, 2006). Quinn et al. (2007) point out that it is the connectivity between the writer and the reader that distinguishes blogs from ordinary paper based journaling practices, bringing the social aspects into learning. The ease and immediacy of the comment function on blogging could encourage the regularity and timeous feedback responses on the part of lecturers, tutors, supervisors and or peers.

E-books which are texts that are made available in electronic format on computers or handheld devices, have also been used in the South African Higher Education sector in a pilot project initiated by the International Association of Digital Publications (IADP) Affordable Access Project, a United Kingdom-based not-for-profit NGO. The main vision of this project has been to improve the education and effectiveness of students who will work in poor communities, particularly in rural areas including agricultural workers, nurses, social workers, teachers and doctors through providing affordable access to digital publications in the form of e-books. The aim of the IADP project has been to enhance education and address issues of poverty through providing affordable and convenient access to high quality, relevant content using digital technology. E-books are regarded as useful in that they are portable and mobile and do not occupy large amounts of space. For students who have to study in multiple environments they are accessible as long as hand held devices or desktop or laptop computers are available. However, in order to be used in a beneficial way, e-books need to be integrated into the curriculum and teaching and learning strategies (Kukulska-Hulme, 2005).

## **Research Design**

This study follows a mixed-methods approach (Creswell, 2002), which includes quantitative and qualitative methods. It is envisioned that there will be two phases to the study - a national survey on the use of emerging technologies to improve teaching and learning in South African HEIs and a series of case studies on innovative teaching and learning practices in the eight HEIs that are part of the research team. The project is funded by the National Research Fund in South Africa.

### **Overarching question**

How could qualitative outcomes in education be realised by using emerging technologies to transform teaching and learning interactions and paradigms across higher education institutions in South Africa?

### **The sub-questions**

In what ways are emerging technologies used in innovative pedagogical practices to transform teaching and learning across South African HEIs?

What can be learnt from an in-depth examination of case studies of innovative practice in a sample of HEIs in which these emergent technologies are being used?

What are the conscious and tacit theoretical assumptions guiding higher educators' teaching and learning practices?

What models of innovative theory and practice can be developed from the identification of transformative teaching and learning interactions and paradigms across the HEIs?

Data Collection Methods.

#### Phase 1 Survey of teaching and learning interactions using ICTs in SA HEIs

The survey has involved designing and prototyping a scoping questionnaire prior to administering this to academics in all HEIs in South Africa to establish current practices regarding emergent technologies to enhance teaching and learning. The online questionnaire comprises of closed and open ended questions. The objective of the survey will be to establish the contexts and conditions that frame current practices of use of emerging technologies within South Africans HEIs.

An online questionnaire was sent to lecturers at HEIs in South Africa who identify themselves as engaged in innovative pedagogical practices using emerging ICTs. The following questions were addressed in the online questionnaire to participants who self-identify as using emerging ICTs to enhance their teaching and learning practices:

The main qualitative questions were - What is the most innovative pedagogical practice that you used recently using ICTs (in the last two years)? What prompted you to initiate or use this pedagogical practice? (own motivation, addressing a specific problem; Please describe your teaching context in which you used this practice (level of programme, discipline, size of class, students' characteristics)? Which technology/tool did you use? Please describe? How did you come to use this specific technology? (eg heard from colleagues, from workshops, from students, from international conferences) ;What impact did it have on your teaching and the learning of your students? Did you use other technologies?

This survey will answer sub-question 1: In what ways are emerging technologies used in innovative pedagogical practices to transform teaching and learning across South African HEIs?

#### Phase 2: Institutional Case Studies

The team of co-investigators, collaborators and students would conduct in-depth case studies (at least one from each of the participating 7 institutions) of innovative pedagogical practices using emergent technologies to enhance teaching and learning in South African higher education, with particular emphasis on those that would be useful and affordable in resource scarce contexts.

These case studies will be used to answer the second and third research sub- questions: What can be learnt from an in-depth examination of case studies of innovative practice in a sample of HEIs in which these emergent technologies are being used? and What are the conscious and tacit theoretical assumptions guiding higher educators' teaching and learning practices?

Progress of the project thus far

The team has administered the questionnaire to HEIs and is in the process of analysing the data. The next phase of data collection will be case studies at the eight institutions involved in the study which will be started in 2012. There will be PhD students who will be pursuing their own projects using emerging technologies as case studies at these various institutions.

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