Converging institutional expertise to model teaching and learning with emerging technologies

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Abstract

There is an increasing disjuncture between the use of technologies and the impact that this has on teaching and learning practice. This challenge is compounded by the lack of institutional preparedness to support emerging practices that harness transformative potential in higher education (HE). Most staff development initiatives have tended to focus on skills acquisition, which have often not translated into pedagogical change. In the previous two years (2011 and 2012), four higher education institutions (HEIs) in Cape Town, South Africa, convened a collaborative short course on 'Emerging Technologies for Improving Teaching and Learning', which was targeted at 43 educators at the four HEIs over the two years it was offered. The objective of the course was to empower educators from the four HEIs with pedagogical knowledge for teaching with emerging technologies by modelling authentic practices. The course provided a unique opportunity for academics to come together in a relaxed and supportive atmosphere to learn, discuss and benefit from valuable experiences of peers and expert facilitators from the four HEIs in our region regarding the use of technologies for improved teaching and learning. This article draws on the theory- based design framework for technology enhanced learning (TEL) to reflect on the two-year inter-institutional facilitation of a course aimed at empowering educators to teach with emerging technologies through modelling practice.

Introduction

There are fundamental challenges facing higher education (HE) globally and in South Africa in particular with respect to teaching with technologies (Bozalek, Ng'ambi and Gachago 2013). In this article we will focus particularly on emerging technologies (Ng'ambi and Bozalek 2013) as these are increasingly popular and ubiquitous among both students and educators. However, effective uses of these emerging technologies for teaching and learning remains a barrier and is a concern to many researchers in this field (Burnapp 2011; Sharpe, Beetham and De Freitas 2010; Bonk 2001; Graham, Cagiltay, Craner and Duffy 2000; Khoza 2011). Research has shown that unless sufficient support and training are given to lecturers regarding emerging technologies, uptake will remain on a superficial level, reinforcing passive, teacher-centred and didactic pedagogies (Bertolo 2008; Herrington et al. 2010; Veletsianos 2011). While most institutions report commendable growth in staff development initiatives, e.g. workshops and seminars with a particular

focus on the use of technologies in teaching and learning, there has been little effect on changing pedagogical practice and in assisting lecturers to acquire the necessary knowledge and skills for their own practice (Sharpe, Beetham and De Freitas 2010). Demonstrations of lecturers' innovative teaching practices involving technology are also scarce (Price and Kirkwood 2013). Our thesis is that modelling authentic pedagogical uses of emerging technologies in staff development programmes is likely to influence pedagogical practices in a positive way. This article explores the extent to which participants in a staff development programme implemented across four institutions of higher learning in the Western Cape on 'Emerging Technologies for Improving Teaching and Learning' were able to apply the practices we sought to model in their own teaching and how they perceived this particular approach to staff development.

The article is structured as follows: we first provide a background context to the inter-institutional pedagogical project, then describe our approach which de-emphasises teaching and foregrounds learning; secondly, we discuss the theory-based design framework which guided the study; thirdly we describe two iterations of the course – which we refer to as Case Study 1 implemented in 2011 and Case Study 2 in 2012. We further present an analysis of participants' responses to these two courses. Finally, we provide recommendations and conclude that the course was largely successful in modelling good pedagogical practice through collaborative design and delivery which culminated in a rich experience for both participants and facilitators.

Background
The South African HE environment is confronted with systemic educational challenges. Among these are financial and infrastructural constraints that hinder technology adoption (Van Biljon and Dembskey 2011). The general historical background of South African higher education institutions (HEIs) is still affected by apartheid legacies based on racial differentiation and this has reinforced siloed approaches to addressing educational challenges, further hampering technology adoption. Inter-institutional teaching (Ropp and Dickson 1999) is an approach with the potential to limit the effects of racial differentiation and the segmentation of teaching. Yusuf-Khalil et al. (2007) report on the benefits of collaborating on an online course for students and academics across five countries. More recently, a pedagogical project across two differently placed HEIs in the Western Cape (see Bozalek et al. 2010; Leibowitz et al. 2011; 2012) showed the powerful impact that inter-institutional and cross-disciplinary pedagogical projects can have on both students and educators. These initiatives provided the impetus for teaching and learning specialists from four institutions to convene a single course for educators drawn from these institutions on the use of emerging technologies for improving teaching and learning. The four institutions were the University of Cape Town (UCT), the University of the Western Cape (UWC), Cape Peninsula University of Technology (CPUT) and Stellenbosch University (SU), all situated in the Western Cape in South Africa.

An inter-institutional course as a disruptive practice

One of the challenges facing HEIs is an ongoing spiral of increased costs coupled with decreased government funding and increasing student resistance and incapacity to pay high tuition fees (Anderson and McGreal 2012). According to Anderson and McGreal, HEIs are under pressure to find innovative ways of using limited resources efficiently and effectively through exploring innovative ways of teaching to both widen access to education and to enhance students' learning experience. However, the challenge lies in uplifting the quality of teaching as a practice across disciplines at institutions (The Learning Technologies Collaborative 2010). While individual institutions have developed staff development strategies, these approaches are not usually packaged as a comprehensive unit delivered in the form of a course. The other important consideration for embarking on this project was to address some of the systemic inequities in the South African HE sector by working in an inter-institutional way, and in so doing to share resources and encourage a cross-pollination of ideas and collaborative relationships. This article reports on a course developed and delivered jointly by four HEIs aimed at enhancing the quality of teaching with emerging technologies at the participating institutions. This non-credit earning course was offered for two years to two cohorts (2011 and 2012 cohort) and was attended in total by 43 educators from participating institutions. The course was offered through the Cape Higher Education Consortium (CHEC) as part of a suite of teaching and learning short courses for academics across the four HEIs in Cape Town.

De-emphasising teaching, foregrounding learning

One of the approaches used in the course was to encourage the creation of learning communities at participating institutions. Given that facilitators were from the four institutions, participants were assigned a 'mentor' based at their institutions. The mentor's role was to provide support but also to facilitate institutional-based collaboration. Dabbagh (2005) remarks that learning communities have the potential to provide an environment that is both authentic and challenging and has as its foremost advantage the de-emphasis of teaching and the foregrounding of learning. By authentic learning we refer to the work of Jan Herrington and her colleagues in which they have developed nine elements of authentic learning. These elements are hinged around an ill-defined authentic task which is scaffolded, has real-world relevance and where multiple role models provide a number of different perspectives on the task at hand (Herrington et al. 2010).

The pressures of HE in terms of inequities across the system, limited teaching time, the soaring cost of education and diverse levels of student preparedness made it important to offer a programme that responds to some of these challenges and would be perceived as highly meaningful and easily adaptable to participants' teaching environments. The level of filtering for relevance of what they were learning was therefore high. The course was structured around authentic activities that encouraged participants to focus on their own context, own students and teaching challenges, thereby making learning 'meaningful and relevant to the learner's interests and goals' (Dabbagh 2005, 33). Saunders and Gale (2012, 856) caution that tools will only be used if they are perceived as useful by students or if they are designed to form part of the students' assessment. To ensure uptake, we incorporated both. Our goal

was to make learning experiential and to give participants opportunities to practise alternative ways of teaching and learning. A pre-course survey was used to gain a sense of what tools were already familiar to participants and which ones they perceived to be useful and needed to learn about.

Widening access through shared discipline or interest around tools

An increasing number of scholars have confirmed the pedagogical value of social networking (Konert et al. 2012). In their study on the role social networks play in learning environments with a particular focus on how social networks are used for knowledge sharing and students' support, Cadima, Ojeda and Monguet (2012, 301) observe that there was a 'significant association between closeness, centrality and performance'. Put simply, the concepts of closeness, centrality and performance mean that the higher the number of contacts an individual has and that the shorter the distance from one individual to all the other individuals in the community, the better his/her performance becomes. We inferred from this that bringing together educators from institutions located in close proximity to each other would leverage institutional staff development initiatives and enhance the teaching performance. We reduced the ratio of facilitators to participants by ensuring that at least two facilitators from each HEI (in total eight facilitators) were available to coach and scaffold approximately 22 participants per cohort. This also meant that there was a wide range of expertise available regardless of what institution one came from. Our assumption was that educators would widen access to counterparts based on either shared discipline or interest around tools. In addition to the physical proximity that we provided to participants, we made extensive use of social media applications to allow for ongoing communication and community building among participants beyond the face-to-face meetings.

De-emphasising tools and emphasising practice

From the outset, the facilitators took a deliberate decision to make the technologies 'invisible' and thus rather placed emphasis on pedagogically innovative practices. Tambouriset al. (2012) distinguish between *technologies* such as blogs, podcasts and wikis and the *practices* of blogging, podcasting, and writing collaboratively. Thus, according to Tambouris et al. (2012), teachers can use Web 2.0 tools in a teacher-centred way; for example, a teacher may create a blog to disseminate information to learners without allowing learners to comment. One of the objectives of the course was to model ways of teaching with emerging technologies in ways that de-emphasise tools and emphasise innovative practices in learner-centred approaches. We were mindful of the fact that realising this learning outcome was difficult, given the educators and institutional cultures. As Tambouris et al. (2012, 240) rightly observe, 'adopting Web 2.0 learning includes more or less radical changes in the relations between learners and teachers in terms of power and control over the learning processes and environments. Thus, new tensions and challenges arise.' What has to be borne in mind, however, with these endeavours, is that cross-institutional projects need to be supported on a policy and institutional level to make them sustainable (Bozalek et al. 2010).

Theory-based design framework for e-learning

In choosing a theoretical framework, we were mindful that in whatever we did in the course, either consciously or unconsciously, we were modelling transformative practice to participants. To this end, we drew substantially from Dabbagh's (2005) conceptualisation of the theory-based design framework as it captured our teaching approach – to foreground learning, widen access to shared disciplinary knowledge and emphasise practice over tools – very well. Ng'ambi and Lombe (2012, 190) provide a useful example of the difference between a tool and practice:

... some of the educational benefits accrued from using podcasts include facilitating the meaning making process, directing learning through facilitating question formulation, facilitating critical engagement with content and effective communication of ideas through students' reflection on peer's podcasts.

We therefore agree with Dabbagh (2005) that meaningful learning and interaction involves three interrelated iterative components: the pedagogical models (for example, modelling teaching with emerging technologies through knowledge building communities), the learning strategies (i.e. focus on the practice of blogging, podcasting, and writing collaboratively as opposed to merely creating an awareness of tools), and pedagogical tools (i.e. demonstrating affordances of technologies such as blogs, podcasts and wikis). Dabbagh (2005) contends that the increasing availability of technologies to both learners and educators is transforming both pedagogical and social practices. We inferred from Dabbagh (2005), who emphasises the importance of ascertaining the learning abilities and needs of participants, that there might have been participants on the course who were aware of new pedagogical and social practices shaped by use of emerging technologies that may have exceeded the facilitators' knowledge of these practices. To acknowledge this and make the best use of participants' abilities, we wanted to flatten the hierarchical structure between facilitators and participants by seeing knowledge as co-constructed. Accepting this view, we wanted to create a conducive learning space where participants could be free to share ideas as more knowledgeable others with peers and facilitators. This practice is being foregrounded in work on formative assessment such as that of Boud (2013) and Boud and Molloy (2013). This being a practice-based course, participants were encouraged to focus on their own practice in their respective disciplines, reflect on their students' learning needs, and develop practices they could apply with their students. This is consistent with authentic learning activities 'which engage the learner in a realistic and meaningful task that is relevant to the learner's interests and goals' (Dabbagh 2005, 33).

Case study method

The course was conceptualised in 2009 as part of the Cape Higher Education Consortium's (CHEC) initiative to design and develop short teaching and learning courses targeted at educators from the four HEIs in the Western Cape.

Teaching and learning specialists from the four institutions designed these courses collaboratively. There were two iterations of the course, hereafter described as Case Study 1 (2011: 20 participants) and 2 (2012: 21 participants).

Table 1 shows the number of participants from the four participating institutions.

Table 1: Course participants per institution and institutional Learning Management System

Institution	Case Study 1 2011	Case Study 2 2012	Total
UWC	8	8	16
CPUT	3	3	6
UCT	3	3	6
SU	6	7	13
Total	20	21	42

Case Study 2 was an improved version of Case Study 1, which is consistent with the methodology we used for our own research process, namely design-based research, which is used to investigate authentic learning processes (Herrington et al. 2010). The main improvements were based on participants' feedback gathered at the end of the 2011 module:

• Instead of focusing on institutional technologies, such as Learning Management Systems (LMS), which were not equally available at all four participating institutions, we structured Case Study 2 around emerging technologies, which are freely accessible to everyone.

• Participants complained about unclear course information, instructions and guidance in Case Study 1 and for Case Study 2 the course outline was rewritten and streamlined and facilitators aimed to give as much coordinated
feedback as possible.

• Through the use of emerging technologies, such as Facebook groups and
Instant Messaging tools, communication was improved and participants experienced 24/7 support. We also tried to reduce feedback times through, for example, weekly blog reflections.

• In Case Study 2 we also ensured that presentation time by facilitators was kept to a minimum to allow for extended discussion and interactive engagement from participants.

Assignments were streamlined and were all structured to work towards completion of the final assignment, the development of a prototypical learning intervention using emerging technologies, which participants started to design from the first workshop.

We explored a number of emerging technologies and tools in this course. Both the introduction and use of the tools were driven by pedagogical practice as opposed to merely focusing on the tool (see Table 2). This was consistent with the theory-based design approach adopted in the course. It was envisaged that our adherence to the three interrelated iterative components of the theory (i.e. the pedagogical models, the learning strategies and pedagogical tools) would provide an effective modelling approach for teaching with emerging technologies. Figure 1 provides an overview of this process.
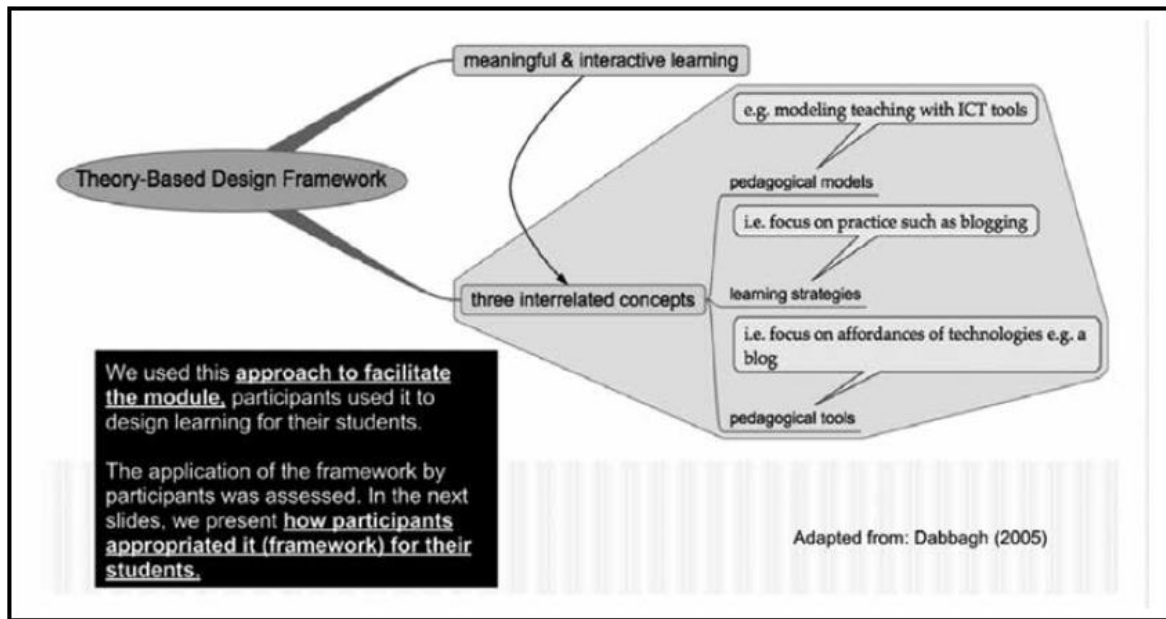

Figure 1: Theory-based Design Framework as applied in this project (adapted from Dabbagh 2005)

Table 2: Integration of tools within our theoretical framework (Source: Ng'ambi & Bozalek 2013).

Pedagogical model	Learning strategy	Pedagogical tool
Modelling authentic pedagogical uses of emerging technologies	Information sharing, collaboration, communication and formal reflection	Blog www.checet.blogspot.com
	Facilitate informal communication, community building, discussions, informal reflection and sharing of information	Facebook group www.facebook.com/groups/checet2012
	Facilitate group discussions or simple mailing lists	Google newsgroups checet-practitioners@googlegroups.com
	Share documents and collaboratively work on documents online, Google Forms as online survey tool	Google docs http://docs.google.com
	communicate and chat online with a group of people, for sharing applications and documents and record meetings. Formative feedback on assignments.	Adobe connect http://meeting.uct.ac.za/checet/
	Audio record and share recordings with a commenting functionality	Soundcloud www.soundcloud.com
	Online collaboration to improve an existing repository of emerging technologies	Wikispaces http://checit.wikispaces.com
	Follow people in a field of research and access invaluable pointers to current articles, blog posts, videos, conferences or just people's opinion on their field of expertise, back channel for participants' feedback during face to face presentations	Twitter www.twitter.com hashtag #checet
	Create and share online tutorials for various tools	Vodcasts and screencasts created with Camstudio and shared on Facebook group and blog

Data were collected from course surveys and reflective blog posts from participants of both cohorts. Extracts from participants' evaluation, obtained at the end of the modules, were analysed using thematic analysis to uncover constructs as espoused in the theory-based design framework. Participants gave informed consent and ethical clearance was sought from one of the participating institutions to conduct the study.

Analysis of results

In the following section we present examples of how participants responded to our modelling of authentic pedagogical practices and then discuss participants' learning experience based on their feedback and reflection.

Effect of modelling authentic pedagogical practices on participants

In one of the questions of the post-course survey, participants were asked to comment on how they planned to use what they learned in their teaching and how they envisaged such use would improve the quality of students' learning. The following extracts and tables show how selected participants linked the technology that they found most useful to an effective teaching and learning practice for their specific context. These answers exemplify how these participants took up our attempts to model best practice:Extract : *I will use the Wikispaces site that I have created as well as vodcasts or screencasts. I think that it will increase student engagement with the course content and enhance their core skills – academic literacy, computer literacy and time management.*

This extract is an example of how this lecturer foregrounded his pedagogical intention to increase student engagement while de-emphasising technology.

Pedagogical model	Learning Strategy	Pedagogical tool
Improved student engagement, academic literacy, computer literacy and time management	Participative creation of course content, development of additional study resources	wikis, vodcasts or screencasts

Extract 2: *I could already see the improved conceptualisation of the logic of research methodology when I have used concept maps the past two weeks and students could now understand even quicker than the different groups that I have gathered data from over the past four years of teaching it.*

This extract shows how this lecturer's use of technology was informed by a need to scaffold students' understanding of research methods and the use of concept maps to support the learning process.

Pedagogical model	Learning Strategy	Pedagogical tool
Improved understanding and conceptualisation of content	Creation of additional study resources	Concept maps

Extract 3: *I will continue to investigate the efficacy of using Facebook. My main focus at the moment is to improve communication between the students and I, and also to use it as an informal method of supporting my students in the upcoming exams. Students are also seeing the value of using this medium.*

Here, the choice of Facebook was again driven by a pedagogical need to improve communication and support for students in preparing for examination.

Pedagogical model	Learning Strategy	Pedagogical tool
Enhanced informal communication and support among lecturers and students	Informal communication and support in Facebook group	Social networking (Facebook)

Extract 4: *Blogging: facilitates a much deeper and broader engagement with my students, will help me lure them into thinking more deeply about theory in relation to daily life, to make connections between topical events and the classroom*

This quote is another useful example demonstrating an emphasis on the practice of blogging rather than on the blogging tool.

Pedagogical model	Learning Strategy	Pedagogical tool
Improved reflection, connection between academic and social content	Reflection and discussions on course blog	Blogs

Extract 5: *I will be using the prototype I've designed (Wiki). I envisage that this will; – increase student engagement, – enhance collaboration, – improve digital literacy …*

This extract exemplifies a need for task design which allowed the use of a wiki to achieve multiple learning outcomes.

Table 3: Pedagogical model	Table 4: Learning Strategy	Table 5: Pedagogical tool
Increased student engagement, collaboration and digital literacy skills	Collaborative writing	Wiki

Extract 6: *Poll Everywhere quick quizzes in class to increase attention span and make lectures more active. Anonymous use encourages shy/unconfident students. Online quizzes – although I'm going to bombard our management with suggestions to make the tool more user-friendly.*

A need to create a safe space for interaction in a traditional lecture was instrumental in this lecturer's choice of tool. This suggests a focus on learning and less emphasis on the technology.

Table 6: Pedagogical model	**Table 7:** Learning Strategy	**Table 8:** Pedagogical tool
Increased attention span, self-assessment and feedback	Use of self-assessment / MCQs / backchannel in and outside classroom	Poll Everywhere, online quizzes

Evaluation of participants' learning experience

In evaluating participants' learning experience, we asked them how they experienced the teaching approach used to scaffold their learning in the course and the extent to which the course focused on practice over technological tools. Our approach was to create an environment where educators could learn without feeling that they were being taught, and we did not want technology to drive pedagogical practice. Achieving the correct balance was difficult but we seem to have succeeded in empowering educators to share their practice. This is well captured in the following comment:

For me it was a firsthand experience using a network-communication environment. I found it greatly engaging and there were so many valuable comments made online that really helped to shape my assignment ... which, I believe would not all have been forthcoming in a face-to-face session. I think it is really about there being a very different vibe when online ... if that makes sense ... it was exciting, new and I felt far less restricted to give comments ... strange, because I'm by no means a shy person ... it almost allows you to change your persona ...

While not mentioning the tool, the participant emphasises the benefit of the specific practice which offered opportunities for open feedback and dialogue. Given this positive experience, it can be inferred that the participant is more likely to want to create a similar learning experience for his/her students (Herrington et al. 2010).

The use of the theory-based design model allowed participants to step back and think about their own practice, and this resulted in deep reflective learning:

I had never really spent so much time reflecting on my teaching and what I'm doing in the lecture room. It was a great and sometimes a sobering experience. I just did not find the blogs too helpful to write the assignment.

The above statement also shows that the participant saw the need to ensure a tight alignment between the pedagogical tools, such as blogs, the learning strategy of writing an assignment and the pedagogical model. Implied in '… I just did not find the blogs too helpful to write the assignment …' is that the pedagogical model could not be achieved by use of the said learning strategy and chosen tool. The use of the theory-based design model for designing the entire course also forced facilitators to think carefully about the coherence of the course and its logical sequence of delivery as noted:

I loved how you guys designed the structure of the entire course … how each exercise led to next and eventually each exercise combining into a finished tool combined with a thought out assignment … excellent. Although I did not notice this on the first day … it eventually was like a little adventure ride :

The participant's experience is consistent with Dabbagh's (2005) claim about meaningful learning as involving three interrelated iterative components which require to be knitted such that the learner gains a seamless experience.

One of the comments that best summed up the experiences of participants, which were highly enthusiastic regarding the course, was captured here: 'Hard to believe this course is over. Relief (it's been HARD work) and really sad (it has been EXCELLENT, so many new ideas, people). Wondering what happens now ….'

Notwithstanding the positive outcome of the course, some frustrations were also noted, in particular with the theoretical underpinning of the course. One participant reported, for example, on what he/she believed were misplaced assumptions that facilitators had about participants' appreciation and interest in the concept of pedagogy:

I did not like the focus on the first day on pedagogy and the use of jargon … not having previously been exposed to pedagogy (despite 15 years of teaching) I found this put me off a lot. There seemed to be an assumption we knew what this was and what the principles were, etc.

The above comment suggests that facilitators had to carefully manage tensions between the theories of learning, the language of talking about learning, and jargon such as 'pedagogy.' It was for this reason that teaching had to be de-emphasised and learning foregrounded. The consequence was a shift in practice from teaching to facilitating learning.

Recommendations

The findings presented in the above section were the basis for a model for the pedagogy of emerging technologies for meaningful learning (see Figure 2).
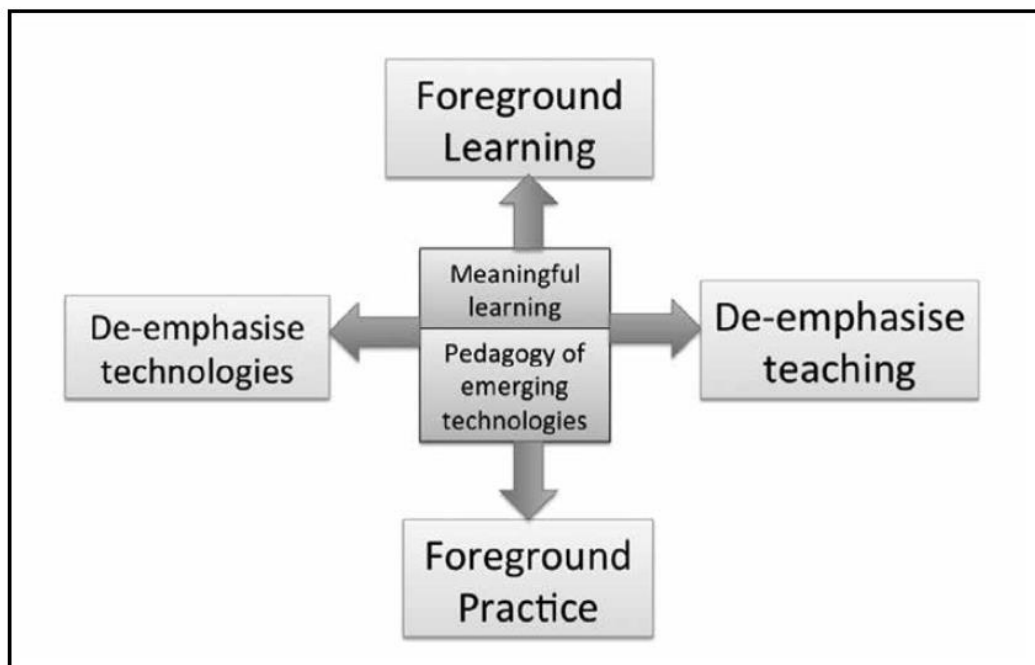
Figure 2: A pedagogical model for teaching with emerging technologies for meaningful learning outcomes

In the above model, any use of emerging technologies requires a balance between learning, teaching, technologies and practice if it has to yield meaningful learning outcomes. If, on one axis, for example, learning and practice are explicitly foregrounded, then teaching and technologies are to be de-emphasised. On another axis, when technologies and teaching are foregrounded, then learning and practice are implicitly de-emphasised.

Conclusion

The article has reported on a two-year study of facilitating an inter-institutional course aimed at empowering educators to teach with emerging technologies. The objective of the course was to facilitate and model possible good practice for teaching with emerging technologies. The primary premise of the course was to model authentic pedagogical uses of emerging technologies and therefore the course itself served as an example of pedagogical design. The facilitators were teaching and learning experts drawn from the target institutions were participants worked. The article has shown how Dabbagh's (2005) conception of meaningful learning and interaction that involves three interrelated iterative components was implemented in the design of the course and taken up by participants in how they hoped to teach with emerging technologies. Findings showed that participants may have learnt how to emphasise learning practices rather than technological tools and this was evidenced in their final presentations where they had to provide a theoretical argument for their pedagogical model, their learning strategies and the tools they adopted, evaluating the whole process. Their evaluations of the course also show that they acquired a more nuanced understanding and engagement with the way technologies and practices are interlinked. However, some participants' responses indicated that the focus on pedagogy, if

not made accessible, can feel foreign and alienate educators who are not exposed to this discourse in their daily work. Participants embraced the move from institutional technologies such as LMSs, to emerging, mainly cloud-based, technologies, which allowed for more immediate informal communication and support and facilitated community building.

One of the key lessons things we have learnt from this experience is the need to have a dedicated facilitator to respond quickly to queries, upload materials and comment on student submissions. Furthermore, negotiating the curriculum design and collaborating with colleagues from four HEIs is a time intensive process. It took many meetings and months of intensive discussion to reach consensus about what should be included in the course, how the course should be delivered and the best way forward on the most appropriate pedagogical strategies. It is perhaps to be expected that possible intellectual tensions could develop, considering there were eight academics from different contexts coming together to co-construct a course for the first time. It is thus important to stay mindful of the goal of fostering collegiality and expansive knowledge sharing community. This sharing included encouraging participants to present at local conferences, such as HELTSA,[1] where a group of participants and facilitators organised a symposium on the use of emerging technologies in HE.

Further research is needed about how educators who attended this short course are able to use what they learnt about the facilitation of a module and the extent to which the course influenced participants' own practice.

Note
1   http://www.emergingicts.blogspot.com/2013/01/heltasa-2012.html

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