

Editorial: Emerging technologies and changing learning/teaching practices

This special issue is being published at a time when emerging technologies (ETs) have become ubiquitous, and many educators in higher education are trialling different ways of using these technologies to respond to varying teaching and learning challenges (see Sharples *et al*, 2012 for some examples of this). These challenges include concerns about the quality and outcomes of teaching and learning in a climate of decreasing resources with a simultaneous increase in massification and diversity of the student population. The widening of participation to a diverse group of students thus brings with it contextual constraints and concerns about social inclusion that require addressing physical and epistemological access (Burke, 2012; Hassan & Nussbaum, 2012; Morrow, 2009). Higher educators are being pressurised to ensure success and throughput of students, while their classes are increasing in size and resources are diminishing, which may unwittingly reinforce exclusion and inequities (Bozalek & Boughey, 2012; Iverson, 2007). In addition to these issues that need addressing, it has to be borne in mind that access to technology, though ubiquitous, will not necessarily bring about transformative pedagogical practices (Veletsianos, 2011). Bates and Sangrà (2011, p 4) are of the opinion that radical change is needed in the design and delivery of teaching if higher education institutions (HEIs) are to be “fit for purpose” for the 21st century. Our thesis is that fitness for purpose is an outcome of a careful balance between educational goals, learning outcomes, design of learning activities and appropriation of technologies to mediate the accomplishment of the task. This requires imaginative and creative use of ETs by both students and educators in order to bridge the current pedagogical expectations sandwiched between contextual constraints and concerns. This, of course, also presumes that we understand the meaning of ETs.

Although the construct ETs may not have a universally accepted meaning, there seems to be some degree of agreement that educators are appropriating ETs to effect teaching practice. However, there remains a great deal of uncertainty and confusion about the actual meaning of ETs (Siemens & Tittenberger, 2009; Veletsianos, 2010) that are being used in these pedagogical practices. Often ETs are discussed in academic fora such as conferences and colloquia in taken-for-granted ways, without any in-depth discussion about common understandings of the concept. Literature on a common understanding of ETs in the broader higher educational rather than disciplinary-specific context is also sparse (Veletsianos, 2010). In the 2012 Horizon Report, there is an acknowledgement that there is a need to educate academics to use ETs and that the focus should be on innovative pedagogies rather than the technologies themselves (Johnson *et al*, 2012). Siemens and Tittenberger (2009) subscribe to the view that technologies are not neutral but embody philosophies and ideologies in themselves, reflecting particular worldviews. They see technologies as having multiple affordances by which they mean the actual potential of specific technologies, such as the potential of social software to provide emergent learning paths through interaction with peers. On the other hand, writers such as Veletsianos (2010) take a different view, defining ETs as context-specific—what is emerging in one context or geographical location may not be emerging in another. According to Veletsianos (2010, p 3), ETs are “tools, concepts, innovations, and advancements utilised in diverse educational settings to serve varied education-related purposes.” This means that ETs is a very broad concept that can incorporate theories and concepts in addition to tools. Furthermore, Veletsianos (2010) sees ETs as rapidly changing and

evolving organisms that go through hype cycles and transcend academic disciplinary boundaries. ETs are also not necessarily new technologies—for example, online gaming, virtual learning environments (VLE) and Twitter have been around for some time but may still be considered emerging in HEIs depending on how they are appropriated. Veletsianos also views ETs as those technologies that are not quite yet understood and that are as yet under-researched but that have the potential for transformative educational practice (Veletsianos, 2011). Accepting Veletsiano's loose definition of ETs serves as a useful point of departure in exploring some of the observable effects of appropriating these technologies.

Some of the consequences for the improvement of higher education pedagogy through the use of ETs include the rise in personal learning environments (Martindale & Dowdy, 2010), a decrease in reliance on institutionally regulated learning environments (Lee & McLoughlin, 2010), the need for more integration of formal with informal learning (Dabbagh & Kitsantas, 2012); life-wide together with lifelong learning (Barnett, 2010; Jackson, 2010, 2011) and a demand from students to take more control of their learning (Johnson, Levine, Smith & Stone, 2010). While these are desirable educational outcomes, the realisation of these outcomes requires careful design of learning tasks (Herrington, Reeves & Oliver, 2010). For example, an increasing number of scholars have confirmed the pedagogical value of social networking (Konert *et al.*, 2012; Rambe, 2012), but this does not mean all educational uses of social networking is transformative and will enhance student learning. Johnston *et al.* (2013) report that current students spend most of their free time on the Internet, particularly on social network sites, and whereby creating an alternative “teaching space” for educators but pedagogical use of such students' personal spaces requires careful learning designs.

Tambouris *et al.* (2012) distinguish between technologies such as blogs, podcasts and wikis from *practices* of blogging, podcasting, and writing collaboratively, implying that educators need to focus on the practice rather than on the tools. According to Tambouris *et al.* (2012), despite the affordances of Web 2.0, it is possible for teachers to use these tools in a teacher-centred way, for example a teacher may create a blog to disseminate information to learners without allowing learners to comment. In South Africa, a project sponsored by the National Research Foundation (NRF) researched the use of ETs among educators at 22 South African HEIs and found that some educators used learning management systems or VLE to transform pedagogy through learner-centric activities whereas others used it to entrench their teacher-centred approaches (Ng'ambi, Gachago, Ivala, Bozalek & Watters, 2012). This suggests that use of ETs among educators may require guidelines if they are to transform pedagogical practice, a point with which Bates and Sangrà (2011) and Ng'ambi *et al.* (2012) concur after researching technology for transforming teaching and learning in a number of HEIs across Europe and South Africa. Mere use of ETs may not guarantee that the desired impact on student learning experience is necessarily happening. Thus the relationship between use of ETs and changing learning/teaching practice is non-trivial and not one to be taken for granted. Dabbagh (2005) commends that meaningful learning and interaction, in a theory-based framework, involve three interrelated iterative components: the pedagogical models (eg, modelling teaching with ETs through knowledge building communities), the learning strategies (ie, focus on the practice of blogging, podcasting and writing collaboratively as opposed to merely creating an awareness of tools) and pedagogical tools (ie, demonstrating affordances of technologies such as blogs, podcasts and wikis). Dabbagh (2005) contends that the increasing availability of technologies is creating new possibilities for using technologies, and as a consequence new pedagogical practices and social practices are continuously being transformed. Ng'ambi, Bozalek and Gachago (2013) provide a framework for using ETs to transform learning/teaching (see Table 1):

There is no doubt that changes in teaching and learning environments are increasingly being impacted by uses of ETs. However, the extent to which the uses of ETs contribute to effectiveness

Table 1: Depicts the use of ET tools using the theory-design framework

<i>Pedagogical model</i>	<i>Learning strategy</i>	<i>Pedagogical tool (examples)</i>
Modelling authentic pedagogical uses of emerging technologies	<p>Information sharing, collaboration, communication and formal reflection</p> <p>Facilitation of informal communication, community building, discussions, informal reflection and sharing of information</p> <p>Facilitation of group discussions or simple mailing lists</p> <p>Sharing of documents and collaboratively working on documents online, collection of online feedback</p> <p>Communicating and chatting online with a group of people, for sharing applications and documents and recording meetings; formative feedback on assignments</p> <p>Audio recording and sharing recording with a commenting functionality</p> <p>Online collaboration to improve an existing repository of emerging technologies</p> <p>Following people in a field of research and access invaluable pointers to current articles, blog posts, videos, conferences or just peoples' opinion on their field of expertise, back channel for participants feedback during face-to-face presentations</p> <p>Creation and sharing online tutorials for various tools</p>	<p>Blog http://www.checet.blogspot.com</p> <p>Facebook group http://www.facebook.com/groups/checet2012</p> <p>Google newsgroups checet-practitioners@googlegroups.com</p> <p>Google docs http://docs.google.com</p> <p>Adobe connect http://meeting.uct.ac.za/checet/</p> <p>Soundcloud http://www.soundcloud.com</p> <p>Wikispaces http://checit.wikispaces.com</p> <p>Twitter http://www.twitter.com/hashtag #checet</p> <p>Vodcasts and Screencasts created with Camstudio and shared on Facebook group and blog</p>

and or outcomes of teaching and learning remain unexplored. Thus this special issue is a response to this unexplored terrain of knowledge regarding the conceptualisation of ETs and their appropriation for transformed teaching and learning.

In the last 5 years, we have witnessed uses of ETs spanning different disciplines and contexts. Although this issue is not an exhaustive account of innovative uses of ETs, it provides an interesting cross-section of uses that would be of interest to both practitioners and researchers. We envisage that ETs will become a key research area in the field of educational technology in the next 5 years. Some of the key themes likely to shape research include the following:

- Assumptions and beliefs underpinning effective uses of ETs
- Understanding institution-wide adoption and use of ETs in higher education
- Comparative studies of uses of ETs in resource-rich and resource-poor learning environments
- Institutional responses to ETs for teaching and learning
- Gender and uses of ETs in innovative practices
- Use of ETs for advancement of research
- Changing practices through uses of ETs—change dynamics and tensions regarding management approaches
- Off-campus uses of ETs to enhance teaching and learning processes
- ETs in blended programmes
- Uses of ETs in staff development
- Role of ETs in community engagement
- Interfacing ETs with open educational resources

This special edition focuses on how ETs are being used to transform teaching and learning practices in higher education, which may lead to qualitative outcomes in education. We therefore invited the submission of papers for this special issue, which were located at the intersection of ETs, teaching/learning challenges and emergent practices with the view to highlighting some of the uses of ETs that are both innovative and transformative of learning/teaching practice. We hope that the collection of papers in this edition will inspire innovation, creativity and transformative practices among both educators and researchers of educational technology across disciplinary boundaries and institutional constraints.

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