

## COMMENTARY

# It appeared to be a good idea at the time but . . . A few steps closer to understanding how technology can enhance teaching and learning in medical education

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I think most medical educators now accept that e-learning is here to stay but there are still nagging doubts about how it can be used in the most effective way to enhance teaching and learning (Baldwin et al. 2011). Creating an e-learning resource, whether it is a podcast, virtual patient or an online module, initially appears to be a simple task but the reality is that even the most carefully designed resource may not be used by the learner, and if it is used, it may not be used in the intended way. This is not only very frustrating to all concerned but can also prove to be extremely costly, both in wasted time and effort but also in financial terms. The collection of articles in the current issue of *Medical Teacher* offers some essential and highly practical advice to all educators who want to ensure that the development and implementation of e-learning resources is done in the most effective and efficient way. Carefully following this advice is also likely to be the most cost-effective approach, and this is increasingly of concern to everyone in the present economic climate (Walsh 2010).

Several articles in this special issue highlight the importance of using a systematic process in the development of a wide variety of e-learning resources (Adams et al. 2011; Harden et al., in press; McGee & Kanter 2011). This process may initially appear to be obvious and cumbersome but often the most basic aspects are either forgotten or ignored. Ellaway and Davies (2011) emphasise the necessity to apply well-known multimedia design principles so that the essential cognitive processes required for learning can be activated. This view is supported by Dror (2011) who recommends 'brain friendly' design to optimise learning by achieving correct mental representations that will be remembered and applied in practice. The clear message is that effective learning cannot be guaranteed but without careful design it is less likely to happen.

Harden et al. (in press) and also McGee and Kanter (2011) describe the need to evaluate a prototype for any e-learning resource so that the resource can be refined and further developed. This is an essential step that in my experience is often ignored yet it is the first opportunity for the hopes and expectations of the developer to be challenged by the face of reality. Understanding both the usefulness and usability of an

e-learning resource by the intended user can be a salutary experience for the developer. The perceived usefulness considers the extent to which the needs of the learner are met by the resource, and includes factors such as the nature of the educational content, but it is intertwined with the usability of the resource, which considers factors such as how easily the content can be accessed by learner (Sandars & Lafferty 2010). How often do we become frustrated and give up when we cannot find how to navigate from one screen to another or the font is too small to read on screen? These experiences are often not shared with other developers and a journal article that clearly describes why a particular e-learning approach was not effective can be as informative to the medical educator as one that was highly effective. Another approach to shortening the development cycle is to collaboratively develop e-learning resources, such as that described in this issue by Berman et al. (2011) for the development of virtual patients.

Widespread implementation of an e-learning resource is the time when the developer can become highly frustrated by how learners actually use, or more often, not use the resource as expected. Despite carefully following a systematic process in the development of the resource, their well-intentioned efforts are surprisingly not realised. Why should this be the case? My personal experience across both undergraduate medical education and continuing medical education is that we do not fully appreciate the learners at which we target our e-learning offerings. All learners will make strategic choices about how and when they go about the process of learning. Several recent studies have explored the learner's perspective on e-learning. High use of online continuing medical education is often determined by the pressures of home and work, with some learners who deeply engage with the learning content but others who only want a superficial approach (Sandars et al. 2010).

The present generation of undergraduate learners rarely see e-learning as a separate entity or special activity (JISC 2010). Each learner will create their own unique approach to learning that integrates a variety of preferred and commonly used personal technologies, such as mobile devices and social networking sites, with institutionally provided technologies, such as virtual learning environments. This integration allows

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learners increased choice about what and how they learn, as well as where and when they learn. Three studies in this issue describe the current reality of implementing e-learning in undergraduate medical education. The study by Khogali et al. (2011) found that individual learners made variable use of the available resources. Interactive multimedia presentations and quizzes were considered to be useful for their learning but they made little use of the discussion boards. This is not to say that these learners did not collaborate online and I suspect that most of them had active discussions on their favourite social network sites, such as Facebook, and that they were also using their latest mobile phone with web browsing functionality. It would also have been interesting to see whether this group of learners were actively seeking new information from the internet and creating their own personalised learning that integrated the learning content provided by the course with information directly related to their own self-identified learning needs. Grant et al. (2011) noted that many learners were highly self-directed in their approach to learning and that they used a variety of resources to meet their needs, as well as prioritising the conflicting demands on their time. Halbert et al. (2011) also found that the learners who made high use of e-learning had an active, global and intuitive learning style.

An important question for all medical educators is how can the collection of articles in this special issue of *Medical Teacher* inform future practice? The article by Ellaway (2011) provides some direction by suggesting that e-learning is now in a more mature consolidation phase and that our attention for future research and development should move towards a deeper understanding of the essence of using technology to enhance teaching and learning. One clear and resounding message from the literature is also that effective e-learning requires a successful alignment of a wide range of factors, including the needs of the learner, the available technology, the educational approach to ensure that learning occurs and the context in which the proposed resource will be implemented (Zaharias & Poylymenakou 2009).

My own belief is that we must increase our understanding of how all learners approach their personal journey to create their own unique learning experience and that we can only achieve this understanding through the examination of our own personal philosophy about the nature of teaching and learning. We have to accept that learners will adapt whatever e-learning resource that we provide to their own personal circumstances, whether it is their preferred style of learning, their use of a favourite technology or to fit in with the competing pressures within their lives. The simple fact is that not all learners will use all of the e-learning resources all the time and for all their learning. This realisation may be hard for many medical educators to accept and even harder to make a response. My first suggestion for the future is that we continue to strive for the provision of high quality e-learning resources that have a real impact on learning and that we also make greater use of a systematic process in their development and implementation, allowing sharing of our hard-earned experiences between medical educators. My second suggestion is that we also begin to provide increasing opportunities for learner generated contexts (Luckin 2006). These are not alternative approaches to teaching and learning but are

complementary to existing approaches. Each learner creates their own personalised learning experience by integrating a wide variety of learning resources created by institutions, such as podcasts and blogs, with the vast range of resources that are freely available from the internet. In addition, learners can create their own resources that can be shared with others, such as on YouTube, or to develop online communities for collaborative learning. This approach to creating a richer and deeper personalised learning experience requires a more 'hands-off' approach by the medical educator but it also requires new competences to be developed by both the educator and the learner (Sandars 2009).

There are no easy answers to ensure that technology can reach its future potential to effectively and efficiently enhance teaching and learning in medical education. However, perhaps, we can follow the approach of our undergraduate learners and begin to actively collaborate and share our experiences through online networks of medical educators. We know it makes sense!

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## Notes on Contributor

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