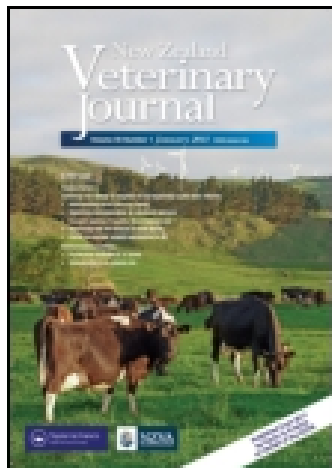


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Veterinary education in a connected world

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Guest Editorial

Veterinary education in a connected world

There is no doubt that life is changing in our connected, digital world. In an age of information, new technologies bring the world's knowledge to our fingertips. We are more connected than ever to others around the world, socially, culturally and economically. What we can do and how we can do it is changing. Even our cats now play with apps. Recently the press and social media have been abuzz with talk of “disruptive”, “revolutionary” or “game-changing” effects of technology on higher education (Hallagher and Garrett 2013). Some talk of a bright new future, and others predict doom and the collapse of universities everywhere. Still others are sceptical that anything much will change at all. The sceptics have a good point, as the fundamental ideas about how best to help learning have been around a long time without significant upheaval from technology. However, developments in online learning and simulation technology are providing new ways to apply these teaching fundamentals in veterinary education.

Online learning is now ubiquitous in both face-to-face and distance courses. The online classroom is used to communicate with students and to provide course materials that they can access wherever they are. It can also be used to provide a variety of media content such as images and video, and exercises, scenario-based simulations and tests. Frequently, online discussion is used to support face-to-face and distance teaching. Discussing things online has advantages in giving students time to reflect and give more considered responses than they are able to in a face-to-face situation (Meyer 2003). Accessing online learning is becoming easier and easier for students from home or work or even while in the lecture theatre. More teachers are designing lectures that involve the audience answering polls or quiz questions or contributing comments using their computers, tablets or mobile phones (Plant 2007; Doucet *et al.* 2009; Rush *et al.* 2010). For distance students, communicating and collaborating gives a sense of belonging that is motivating and supportive (Xiaojing *et al.* 2007).

The idea of whole courses being delivered online is not new at Massey University, New Zealand's only university with a veterinary faculty, with its long history of distance education. Now worldwide attention has focussed on online courses because of massive open online courses (MOOC). Even though there has only been one MOOC in veterinary science so far, this new phenomenon is causing change indirectly. MOOC are online courses that are free and available to anyone, whatever their education level. They are offered by very prestigious universities with substantial financial input that enables high-quality production (Hallagher and Garrett 2013). There has been spectacular interest in MOOC with courses typically attracting 50,000 participants (Jordan 2013). This is why they are termed as “massive”. The number of MOOC available is growing quickly and they span a wide range of subjects (Hallagher and Garrett 2013). More and more universities are signing up with MOOC providers to

create courses. MOOC have provoked a lot of valuable discussion at conferences and in social media about what constitutes good online teaching (Daniel 2012). Lessons are being learned about how best to support online learning from studying the huge datasets that such massive courses generate (Shum 2012). MOOC are also providing impetus for developing business models that can encourage and sustain open sharing of educational resources into the future. Organisations like UNESCO have advocated for some time that all educational materials produced with public funding should be freely available (Anonymous 2012). As the financial and intellectual property issues are ironed out, the amount of open resources available and their quality and sophistication will no doubt grow.

Massive open online courses are highlighting an age-old problem. Lectures and textbooks are very efficient ways to transmit large amounts of information and can be scaled so that large numbers of learners can be economically taught. However, we know that knowledge can't just be poured into students (Biggs and Tang 2007). Techniques that involve the student actively, and provide individual feedback are more beneficial. These include collaborative group activities such as problem-based learning where the strengths of the group increase the learning of all (Kirschner *et al.* 2009). These types of activities depend on having reasonably small groups of learners and personal interaction between students and with teachers. Most MOOC, however, are based on a series of short online lectures, supplemented with examples, exercises and quizzes (Hallagher and Garrett 2013). There is little or no personal interaction from lecturers, and feedback is either automated or provided by students on the course who mark each other's assessments. Lectures and textbooks do have their place as learning resources, as do MOOC. The trick is to integrate them with either a face-to-face or an online curriculum that incorporates human-to-human interaction. Having freely available, high-quality resources could free up time for teachers. Instead of duplicating and reproducing content, teachers could be interacting with students, facilitating learning and providing feedback, either online or face-to-face. With content available online, face-to-face time could be reserved for discussion and group activities rather than lectures.

Developments in simulation technology are also exciting. Simulations are ideal for learning because experiences can be controlled, stopped and started to allow for discussion and analysis and repeated practice of difficult steps (Scalese and Issenberg 2005). They increase the opportunities for practice for students at the same time as reducing animal use and removing risks of harm to the student, animal and other people. While they won't ever fully replace real-life learning opportunities, simulations help prepare students to take full advantage of practical opportunities when they do arise.

There are a range of types of simulations available (Valliyate *et al.* 2012). On computers, students can practice communication with clients, assessment of clinical information and decision making in online virtual scenarios situated in veterinary hospitals, farms, or even simulated disaster sites. They can manipulate 3D images and watch animations to visualise anatomy and physiological

processes. Video streaming technology lets them remotely observe real procedures, allowing, for example, a surgeon's eye view without interfering with the procedure. New technologies are also bringing simulations to the field in hand-held devices like mobile phones. Real maps and images can be incorporated with location awareness software. Group activities with mobile devices can involve individuals in different roles while out in the field. For example, a group simulation could model disease spread and response (Rosenbaum *et al.* 2007). Mannequins simulate animals for learning a variety of procedures from simple suturing to neutering, orthopaedic surgery and anaesthesia. They are increasingly sophisticated and realistic, mimicking physiological responses to drugs and manipulations (Valliyate *et al.* 2012). A new type of simulator uses "haptic" technology to simulate the feeling of veterinary procedures such as rectal palpation in the cow and horse and abdominal palpation in dogs and cats (Baillie 2007). Haptics are now starting to be incorporated into mobile phones and gaming devices. Combined with 3D virtual world simulation technology, haptics might one day allow a multisensory experience for practicing veterinary skills.

Veterinary schools already collaborate in teaching, but the growth in connectedness and open educational resources is going to make widespread collaboration and innovation easier. The curriculum of the future could be a shared global one, with each veterinary school contributing according to its strengths and teachers providing context, local emphasis and insightful guidance. Online learning brings opportunities to connect veterinary students from across the world to give them a global perspective. It gives access to lifelong learning from the workplace and home. It provides a way of connecting groups of people, in all sorts of places, with digital learning materials and online simulations and, most importantly, with teachers and each other.

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