

Engaging Animal Health Professionals Online In Postgraduate Epidemiology Training

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Abstract

Online classrooms can provide epidemiology training to animal health professionals working in diverse locations and a variety of roles who require flexible postgraduate education directly applicable to their work contexts. This paper presents a model for student engagement in online training in epidemiology used in the Veterinary Public Health Management (VPHMgt) program at the University of Sydney. The model engages and supports students through four learning modalities to achieve specified learning objectives in a stimulating learning environment. High scores on student evaluations and positive facilitator responses provide evidence of the effectiveness of this model.

Introduction

Animal health professionals working in clinical, government and research settings are increasingly recognising their need for applied epidemiological knowledge and skills. Until recently, postgraduate training in epidemiology has been limited to degree programs requiring attendance on campus and courses or study groups organised by university, government or professional organisations. However, since 2003, four Masters programs¹ have emerged offering epidemiological training by distance education (that is, delivery of course material and assessment to students located off campus). One of these, the Veterinary Public Health Management (VPHMgt) Masters at the University of Sydney, offers 10 courses in veterinary epidemiology and economics² using online classrooms where both academic staff specialists and external experts facilitate structured learning activities.

Epidemiological training involves teaching key, sometimes abstract, epidemiological principles, providing exposure to epidemiological methods and equipping students with the ability to apply these to new and real-life situations. The emergence of technology to support online delivery presents educators in veterinary epidemiology with unique opportunities to integrate these training activities with more timely and frequent interaction between facilitators and students all within the online framework of a diverse, international student community. This paper presents a model for student engagement in on-line training in epidemiology developed for use in the VPHMgt Masters program.

Model for student engagement

The model, which was founded in the student-centred and aligned approach to teaching (Biggs, 2003), involves engaging and supporting students in collaborative activities, to gain the desired knowledge and skills (Figure 1). Each online epidemiology course in the VPHMgt program applies this model to ensure that students achieve the specified learning objectives.

Learning objectives are a critical component of the model, because they dictate the direction and quality of other course components. For each course these are set to direct students toward attainment of higher-order learning such as the ability to critically evaluate, integrate and synthesise concepts, and apply them to new contexts (Biggs & Collis, 1982). Attainment of this level of learning, which requires constructive interaction with a facilitator and peers in a supportive and relevant learning environment throughout a course, is achieved through four learning modalities:

- Self-led – Students work through content presented in a unit study guide, required readings, web resources and self assessment exercises

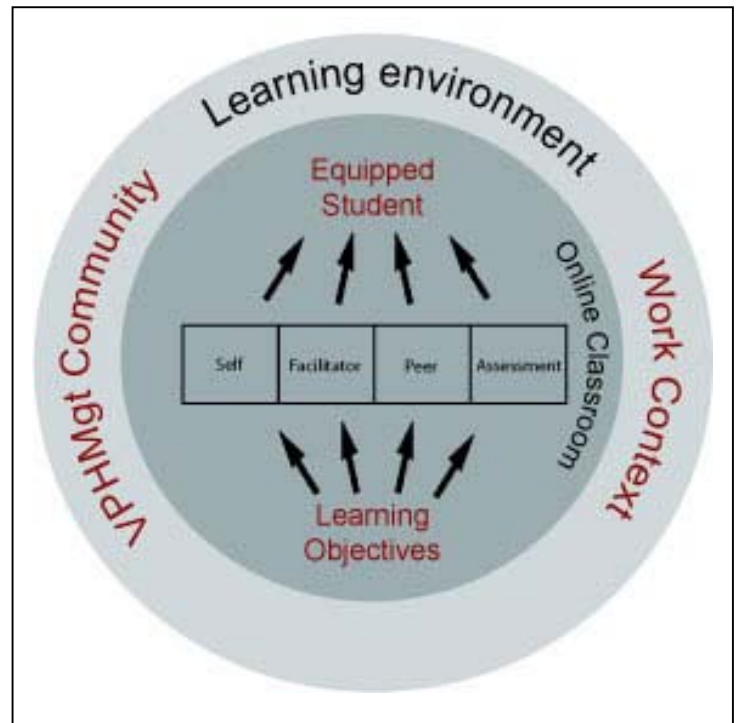
¹ Masters programs delivered by distance education that include compulsory epidemiology courses:

DVM/MPH at the University of Minnesota, VPHMgt at the University of Sydney, Veterinary Epidemiology and Public Health at the Royal Veterinary College and Professional Master of Science in Food Safety at Michigan State University.

² Veterinary epidemiology 1, Veterinary epidemiology 2, Animal health economics, Data analysis for policy making, Animal health data management, Wildlife epidemiology, Aquatic animal epidemiology, Risk analysis, Surveillance preparedness & response, Diagnostic tests

- Facilitator-led – Student understanding of content is clarified, confirmed, challenged and extended through participation in online learning activities designed by the facilitator
- Peer-led – Student understanding of content is improved through collaboration with peers in the online learning activities
- Assessment-led – Student achievement of learning objectives is assessed by completion of authentic assessment tasks individually and in virtual teams online.

Figure 1
Diagrammatic representation of the model for student engagement used in the VPHMgt program



The Online Classroom

The facilitator-led and peer-led learning modalities involve student participation in the course online classroom, enabling collaborative learning that is facilitated by specialists who provide expertise and support. Initial student engagement is accomplished through presentation of a relevant and challenging learning activity in the online classroom and stipulating that contribution to the online class is a course requirement and marks will be allocated on the quality of student contributions. Continued student participation is dependent on the enthusiasm stimulated by the learning activity and responses from the facilitator to guide and extend learning.

Online learning activities provide a unique opportunity for using disparate ideas to build upon a theme or topic. Students, equipped with core knowledge gained from course readings and exercises and primed by issues in their work, enter the online class to read the activity and then contribute either immediately or later to a discussion that refines and extends their understanding. This asynchronous forum permits students to revise content, research and reflect throughout the discussion and thus promotes a more comprehensive and thoughtful coverage of a topic than might be achieved in face-to-face teaching. This collaborative environment encourages peer teaching, which builds a community of practice (CoP) where groups of people informally share expertise and passion for a joint task (Wenger and Snyder, 2000). This CoP, distinctive because it is global and interaction is largely remote, extends beyond the duration of studies in VPHMgt program and supports the notion that epidemiological knowledge and activity is a team effort (Sfard, 1998).

The assessment-led learning modality extends collaborative learning online by requiring students to complete some assessment tasks in teams by distance and across geographical and time zones. These team tasks are authentic and develop skills and knowledge required in the workplace (Herrington & Oliver, 2000). Additionally, tasks are innovative and promote development of problem solving and teamwork skills, equip students with epidemiological and generic skills essential to effective response to disease outbreaks and management of veterinary public health issues. Individual assessments, while similarly designed to be authentic, also ensure individuals demonstrate achievement of learning objectives.

Learning environment

VPHMgt students complete the requirements for their epidemiology courses within a learning environment that consists of their work contexts and the online VPHMgt community. In VPHMgt courses, student learning is promoted by active participation online where 'knowing what' and knowing how' are integrated within the learning environment (Allan, Otta & Hoffman, 2004; Spector, 2000).

Students recognise the benefits of this ‘situated’ learning (Henning, 2000) and can directly apply their learning and draw upon the multiple perspectives presented online to real-life work. This is exemplified in an unsolicited comment from a student: *Whatever new skill I learn, I can put into practice immediately and share my experiences with my fellow students and lecturers - what a pleasant arrangement.*

The VPHMgt program builds knowledge ‘containers’ – study guides, discussions, a community of practice – to which students can return to retrieve knowledge. Such knowledge ‘containers’ are useful in any learning environment but are particularly pertinent in VPHMgt program. Research in educational psychology has strongly suggested that humans will externalise as much information as possible, which is particularly obvious in the use of software to store and manipulate data in epidemiology and economics (Allen et al, 2004). The VPHMgt program’s knowledge containers (and assessment approaches) encourage students to draw on this knowledge, enhancing their individual and collective ability to perform as epidemiology students and practitioners.

Effectiveness of the model

Student success in gaining the desired learning from VPHMgt epidemiology courses is evident from student grades (across 8 courses delivered in 2005 the average percentage of students with distinction/high distinction grades was 52%) and student course evaluations (the average mean score for overall satisfaction with a course was 4.24 out of 5 (range 3.5 to 4.7) for 8 courses in 2005).

Teaching in epidemiology courses, according to student evaluation, continues to improve as learning resources are refined and facilitators gain online teaching experience. The average mean score for good teaching was 3.7 out of 5 (range 3.5 to 3.9) for 2 courses in 2003, 3.8 (3.3 to 4.4) for 8 courses in 2004 and 4.2 (3.9 to 4.7) for 8 courses in 2005. Facilitators also report satisfaction particularly with ‘mentoring young professionals and shaping their professional careers’ (Facilitator pers comm).

Conclusion

The challenge of delivering postgraduate epidemiology training online to animal health professionals requires new thinking about teaching and learning in these disciplines. Using an integrated model for student engagement in online courses fosters collaborative, situated learning and is considered by students and facilitators to be effective.

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