

PHYSICAL VERSUS VIRTUAL PRESENCE: ISSUES FOR MEDICAL AND VETERINARY MEDICAL EDUCATION

Introduction and Discipline Specific Context

There has been much debate regarding "embodiment" and on-line learning in education in general.

Traditionally face to face teaching has been the norm in medical and veterinary medical education. This is historical, with both disciplines developing over hundreds of years and adopting an apprenticeship model.

However, with the development of medical education units in the UK since the mid 1980s modern educational teaching methods have in turn modernised medical curricula. These modern methods have welcomed new technologies. The need for more doctors has led to both an increase in medical student numbers at existing medical schools, but also to the opening of new medical schools which have embraced new teaching methods such as problem based learning (PBL). Such schools have rapidly adapted to new technologies as they develop brand new curricula, often for postgraduate students, some of which rely on a significant component of flexible learning. Veterinary medical education as a discipline in its own right tends to lag behind medical education as an inevitable consequence of significantly smaller numbers and associated smaller resources. Nevertheless, there is an increasing recognition of the importance of engaging with topical issues in education in general in order to enhance curricula and optimize the learning experience for students. By virtue of the many similar issues faced by both disciplines, there is much 'common ground' when considering both the utilization and potential impact of e-learning technologies.

A Brief History of E-learning in Medical and Veterinary Medical Education

Initially engagement of the medical and veterinary medical educational communities with e-learning resulted in the development of standalone resources to support learning which in time developed to include audio and video to enhance the 'realism' of the given resource. In veterinary medicine many such resources were originally developed under the auspices of CLIVE (Computer Aided Learning in Veterinary Education¹), a consortium of the 6 United Kingdom veterinary schools. These types of programmes correspond to the first and second generation technologies as defined by Garrison and Anderson² who acknowledge the high cost and skill required to generate such resources. In recent years, there has been increasing focus on the development of Virtual Learning Environments (VLEs) and Managed Learning Environments (MLEs). Using the JISC definitions³, we refer to a VLE as a system with 'components in which learners and tutors participate in "online" interactions of various kinds, including online learning' and MLEs as 'the whole range of information systems and processes of a college (including its VLE if it has one) that contribute directly, or indirectly, to learning and the management of that learning'. Although there are limitations to the type of schema proposed by Garrison and Anderson, their third generation acknowledges the ability that such environments have to facilitate asynchronous and synchronous interactions and thus promote 'constructivist learning'. Most medical and veterinary schools now either use 'off the shelf' VLEs or are active in creating and developing their own customised MLE to more specific requirements; for example the Edinburgh Electronic Medical Curriculum, EEMeC⁴. A further relevant example in medicine is that of Network learning environments (NLE) which are web-based, database driven solutions developed by a consortium of universities led by Newcastle Upon Tyne, including the universities of Nottingham, Durham and Sheffield. The Sheffield experience is described in Roberts⁵ and describes a model for e-learning in undergraduate medical education with the emphasis on supporting and managing the curriculum.

Other political agendas have highlighted the need to develop e-learning. Increasing medical student numbers at a time when the European working time directive is leading to a reduction in doctors hours means that student teaching time is being eroded. Veterinary student numbers are also increasing due both to demands from society and the drive to optimize resources in schools which have traditionally been small and resource-intensive. In this climate, e-learning has been seen as "the solution" to such problems. However, others

have criticized this approach suggesting it represents "Education on the cheap", and that distance learning can only ever be second best to face to face teaching. In this essay we will explore both sides of the argument with reference to medical and veterinary medical education.

The Physical, The Virtual and 'Competence'

In his 2001 paper 'How far is Distance Learning from Education?' Hubert Dreyfus⁶ divides learning into different hierarchical categories according to his thoughts on how students learn through instruction. He describes the various stages of: novice, advanced beginner, competence, proficiency, expertise, mastery and practical wisdom, in a model, similar to Miller's pyramid⁷.

Dreyfus argues that students learning through the internet get 'stuck' at the level of competence because of its limitation regarding embodiment. He argues that 'Only emotional, involved, embodied human beings can become proficient and expert and only they can become masters'. In contrast however, in his paper in response, Burbules asks the question 'why is competence not adequate?'⁸. This terminology is highly relevant and interesting with regards to professional courses such as medicine and veterinary medicine, where the current trend is towards attaining competence. For many years a medical or veterinary degree was seen as conferring "mastery" in that chosen field, such that newly qualified doctors and vets were assumed fully trained in all aspects of their profession. However there has been a recent radical shift away from this paradigm. In both fields the undergraduate degree is now seen as the first step of a continuum of life-long learning. For instance in veterinary medicine the emphasis is moving towards 'omnipotential' graduates rather than 'omnicompetent' graduates given the ever increasing knowledge available in all species and the fact that it is now considered that a newly qualified veterinary graduate could not possibly be 'competent' across all species. Similarly in Medicine, the newly qualified doctor is seen as having gained basic skills with mastery increasingly envisaged as a postgraduate issue and only achievable by those doctors who have completed postgraduate training and are fully accredited.

Competencies have become essential in both Medicine and Veterinary Medicine. In Veterinary medicine the major accrediting body, the Royal College of Veterinary Surgeons (RCVS) requires curricula to match up with specified 'day 1 competencies'. Similarly in Medicine, recent General Medical Council (GMC) documents have set standards expected of the newly qualified doctor, and achieving set "competencies" are integral to this process. These competencies however could not be achieved without a significant component of 'physical presence'. Both disciplines are defined by their need to teach and assess clinical skills. Traditionally the apprenticeship model has been used in medicine and veterinary medicine. In both fields clinical skills are a complex mix of knowledge, bedside skills and attitudes/communication skills, which require, and cannot be learned without physical presence. In Veterinary Medicine, seeing a real case will allow the student to handle the animal, interact with the client and perform basic procedures in 'real time'. In medicine, bedside teaching, where the student is observed taking a clinical history and examining a patient under supervision is a strong stimulus to deep learning and stimulate elaboration. Nevertheless, this fact does not detract from the argument that e-learning can achieve relevant learning for those at undergraduate level, where competence rather than mastery is demanded. Thus even if distance learning cannot be the sole vehicle whereby the student reaches the higher levels of learning as described by Dreyfus, it may still be harnessed to help deliver and assess certain skills and knowledge at earlier stages. In this way, e-learning can be used to augment the tried and tested methods of 'bedside' teaching and the client/patient interactions central to both disciplines rather than replacing these traditional teaching methods which by definition are dominated by "physical presence". One such way in which distance learning is currently being utilized is in the generation of 'e-case studies'.

The Pros and Cons of Using E-Case Studies - A synchronous E-discussion

On-line chat: the aims and logistics

In order to further consider e-case studies we arranged an on-line chat through WebCT. On another level, this also allowed us further experience of synchronous discussions and to

consider in retrospect how these may be incorporated into e-case studies.

A mutually accessible chat room was arranged although initially Helen experienced problems gaining access to this site from a work PC connected to the NHS system, however these were overcome by accessing the system from home. We were hoping that our discussion would be logged, so that we could print out the transcript to add as an appendix for the assignment. We have subsequently discovered that the chat was not logged, and therefore there is no record. We have therefore included a short summary of our discussions below.

On-line chat: The pros and cons of e-case studies

The aim of our on-line chat was to discuss the pros and cons of e-case studies. On the positive side e-cases exploit the flexible nature of e-learning. This was felt to be particularly useful when matching outcomes to learning objectives in areas where there are limited places for all students to experience a particular aspect of the course. For instance in the Respiratory medicine Module the cystic fibrosis Unit is situated at the Western General. Thus students at the Royal Infirmary only gain limited experience of clinical CF. It would therefore be possible for Royal students to cover these aspects of the course through e-cases. In veterinary medicine this is also relevant as regards avoiding exposing students to potentially hazardous pathogens. We discussed the teaching of practical skills and communication skills and concluded that in both disciplines a virtual presence was necessary for "mastery". However we discussed that e-cases may augment the learning in these areas, and might be useful in demonstrating the general approach, thus more in line with Burbules rather than Dreyfus as previously discussed. For instance communicating with relatives / clients is a difficult area, and one in which students get little exposure. The use of on-line case studies, similar to those used by the Edinburgh social work department use this format to good effect⁹.

We then looked at the cons of e-case studies. We discussed issues of confidentiality, which are more applicable to medicine currently, but which were also beginning to be highlighted in veterinary medicine too. Our concerns surrounded the implications of using real case histories with x-rays and other clinically sensitive data, which are currently use in small group teaching sessions. Even if this data is anonymised, the access of such data through the web may be seen as breaching confidentiality. The main problem would appear to be in the policing and surveillance of sensitive material, made widely available on the web. Our search regarding information on confidentiality had been unsuccessful, but led us on to information, and further discussion about surveillance of on-line courses. We read with interest the capabilities of on-line surveillance with the development of software packages which can analyse individual student contributions to discussion boards, chat rooms and downloads of course material¹⁰. In this way student "participation" can be monitored in a virtual rather than physical way.

On-line chat: the process

Reflecting on our experience of synchronous communication, we still feel that the use of a chat room was useful, despite the problems described above. The synchronous aspect of live chat was useful when preparing the assignment, and helped us feel more of a "team". We were able to discuss our thoughts in a more immediate way, compared to our previous e-mail discussions. The use of synchronous communication aided collaboration. This point is illustrated by McInerney and Roberts¹¹ who point out that it is important to appreciate the social context of learners, he explains:

"Development of On-line self can help alleviate isolation and create on-line community which may assist the learning process"

In the context of preparing a collaborative essay, the synchronous communication aids this feeling of "community".


Although synchronous communication is more immediate than asynchronous, we did discover a slight time delay in our responses during the chat session. Interestingly this meant that we both made the same summary points at the end independently! The loss of the record of the session had the effect of making us feel that work had been 'lost'; clearly this would not be

an issue in a face to face discussion and emphasizes the involvement of a 'third party' (i.e. the computer/ technology) in synchronous discussions. If this third party then fails to respond as envisaged in a session intended to be recorded (regardless of whether the problem is operator error or technology breakdown) then there is a feeling of loss of control on behalf of the participants.

E-case studies


Keeping the pros and cons highlighted above in mind, we will now focus in more detail on the types of e-case studies which are currently being used. They are attracting much attention with developers currently in view of the trend towards more student and case centered learning. There are several examples available, the more recent and generally accepted as being 'better' aim to draw the student into the case and increase the realism by having interactions which mimic those that would happen in a clinical situation. The majority of these examples exist as 'standalone' reusable learning objects often used as revision aids and for consolidation purposes. In addition, there are also resources available to support the learning of communication skills. Examples of such resources are shown in more detail in Box 1.

Box 1
Current examples of e-case studies for use in veterinary medical education
The Emergency Case Simulator



The emergency case simulator shown above is an interactive resource produced by the Royal Veterinary College's eMedia unit. The focus is on 'true life' emergencies that presented to the authors and are similar to those which will be met in first opinion practice. The options along the bottom represent the ability to select procedures and diagnostic tests as appropriate with resulting success monitored on the Status panel.

Veterinary Defence Society Communication Skills Resource



The VDS resource uses video to engage students with a consultation and illustrate key issues regarding communication skills.

The e-case study 'the emergency case simulator' is relatively straightforward in that the student considers the information and evidence available then makes a 'clinical' judgment about the relevant intervention. Thus the basic concept is to replicate a 'real-life' scenario using the computer as a delivery mechanism. More complex models such as the case study 'George' embedded in EEMEC allow staged delivery of information building in tasks and assessments as the case develops.

If we consider how e-case studies match with real life case studies in terms of their ability to support the 'competencies' discussed earlier, this highlights that such resources can be useful in terms of knowledge and decision making skills (see table below). They are of limited use regarding professional attributes and not useful for teaching practical skills other than for demonstrating procedures. These limitations therefore require that such e-case studies are embedded within a larger blended programme which ensures that the requisite competencies can be covered. Building in asynchronous and synchronous discussion elements into such studies could however begin to address some aspects of the professional competencies such as team working and collaborative learning.

	Knowledge	Skills		Professional Attributes
		Decision Making	Practical	
E-case studies	+	+		Limited
Clinical cases	+	+	+	+

Conclusions

Medical and Veterinary Medical Education require a blended learning environment with 'physical presence' a vital component of that blend. Use of case studies however provides an ideal opportunity for a parallel rich e-learning experience. Currently most resources are standalone revision aids consistent with the description by Garrison and Anderson of level 2 technologies. Even the best graphics and associated embedded quizzes may not actually 'enhance' the learning experience greatly in terms of promoting an environment where students can begin to construct their own knowledge based on information from a variety of sources i.e. in the way they will be required to when working as a professional in a clinical environment. Thus suggested aims for future e-case study development should be to focus on enhancing case realism e.g. by delivering information in a staged manner so the case 'builds up' over a period of weeks. An example of this type of e-case study is seen in the interactive case reports published in the British Medical Journal¹². These case studies are interactive, and the clinical case unfolds over a period of weeks. The benefits of this type of format were discussed in the accompanying editorial¹³ emphasising the potential learning value of such cases for example in terms of the generation of diverse responses and discussions. Building in asynchronous and synchronous discussion facilities in parallel with case studies may be useful in terms of creating a sense of community and developing the cases such that they become an integral part of the programme. Clearly, as with many other aspects of e learning development, this has resourcing implications in terms of e-moderating and monitoring. Accepting such implications however, there is much to look forward to in medical and veterinary medical education as we seek to support our disciplines with the relevant e-learning strategies to provide an optimal blend of the 'physical' and the 'virtual'.

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