Pharmacy Education, 2013; 13 (1): 157– 161

The use of videos in blended learning to enhance students' learning in systems-based patient assessment with development of associated clinical skills: an Analysis

G. HITCH[1*], J. WILLIAMS[2], A. HERBLAND[2], J. BOWEN[1,3], S. JARDINE[2], P. POWER[2], G. VENSTONE[2]

[1]*Formerly of School of Pharmacy, University of Hertfordshire, College Lane Campus, Hatfield, Hertfordshire, AL10 9AB, UK.*

[2]*School of Health and Social Work, University of Hertfordshire, College Lane Campus, Hatfield, Hertfordshire, AL10 9AB, UK.*

[3]*Hamad Medical Corporation Ambulance Services, State of Qatar.*

Abstract

Background: Many healthcare programmes require students to learn practical skills that involve the physical assessment of patients. Videos of clinical skills can reinforce this learning .

Aim: To develop and evaluate the usefulness of video learning resources relating to clinical skills in patient assessment.

Method: Videos demonstrating approaches to patient assessment were developed to support third year pharmacy undergraduates (n=113) undertaking a module in Patient Assessment. These were evaluated as a learning resource, via a structured questionnaire and by weekly reflective diaries.

Results: Out of 85 (75%) respondents, 73% (n=62) viewed the videos as a positive supplement for learning and 79% (n=67) acknowledged these as an invaluable revision aid. Over 90% (n=77) found the videos extremely useful in the learning of communication skills.

Conclusion: Videos engage and enhance the student learning experience and may provide a sustainable resource for the support and training of teaching staff.

Keywords: *blended learning, clinical skills, patient assessment, pharmacy, videos.*

Introduction

Many undergraduate healthcare programmes require students to learn practical skills related to the physical assessment of patients. The MPharm programme at our University contains a third year module on patient assessment. The aims of the module include the safe assessment of patients in a community or primary care setting such that students are able to differentiate between those patients that can be treated at the point of contact from those that may need to be referred. This involves the use of appropriate technology and near patient testing procedures to inform diagnostic and referral decisions as well as documenting findings and communicating them effectively to both patients and members of the multi-disciplinary healthcare team. Students are required to develop a range of skills, such as taking a comprehensive patient history, or the assessment of various parameters such as heart rate, blood pressure and blood glucose measurement. Students must be able to perform these tasks competently as well as having an understanding of the fundamental principles involved. These skills may be achieved through traditional methods such as lectures and practical classes. However, timetable constraints often mean that these sessions can only be delivered once thus leaving students little time for practice or reflection on their learning needs.

Blended learning offers the opportunity to overcome some of the shortfalls in traditional teaching methods. Garrison and Vaughan (2008) define blended learning as " the thoughtful fusion of face-to-face and online learning experiences- a design approach whereby both types of learning are made better by the presence of the other" (p.5). It is noteworthy that more than 80% of all American universities offer blended learning classes (Arabasz & Baker, 2005) and research by Marquis (2004) has shown that more than 94% of British higher education institutions believe that this type of learning is more effective than traditional face-to-face learning. Evidence also suggests that being able to watch a task repeatedly results in enhanced student learning (Andrew, 2008; Grewal, 2009). With this in mind and taking into account the General Pharmaceutical Council's education standard 10.11 that **"**a curriculum should not be formulaic and should include a variety of learning methods appropriate to subject areas and learning outcomes to be achieved" (p.43), we devised a number of videos to support the teaching of patient assessment in the MPharm programme at our institution. These videos were designed to supplement lectures and practical classes and were made available on the University's e-learning platform such that students were able to engage with material both on and off campus. We then

*Correspondence: Dr. Geeta Hitch, *formerly of University of Hertfordshire, College Lane Campus, Hatfield, Hertfordshire, AL10 9AB, UK. Email: ghitch5@gmail.com*

ISSN 1447-2701 online

assessed the students' response to this learning resource through feedback questionnaires and reflective diaries.

Aim of this study

The aim of this study is to explore the impact and value of videos as a learning resource for a systems-based patient assessment module for 3rd year pharmacy undergraduates on the MPharm degree programme.

Methods

The module team produced 23 videos demonstrating approaches to patient assessment including the application of clinical skills and the use of diagnostic equipment. Each of these was scripted so each element of the assessment was covered in detail. The final recorded videos included the following clinical and communication subject areas: use of clinical equipment for example, use of stethoscope in cardiac or respiratory assessment, use of a sphygmomanometer for measurement of blood pressure, use of the peak flow meter for measuring peak expiratory flow volume; anthropometric measurements such as height and weight used in calculating the body mass index for weight management clinics; demonstration of practical invasive techniques for example, measurements of blood glucose and cholesterol; and a scenario of patient history taking in order to enhance communication skills of the students. The filming of the videos took place over two days and these were then reviewed to identify areas requiring further filming prior to final editing before being made available via the video streaming server on the University's own virtual learning platform.

Students were asked to view these videos as an adjunct to the practical sessions and their views on the usefulness of the resource were evaluated by a questionnaire and weekly reflective diaries prepared by the students.

Data collection via questionnaires:

The questionnaire consisted of nine stemmed questions comprising demographic information, students' preferred methods of learning, usefulness of videos as a learning resource, and finally suggestions for other areas where videos might be used effectively to support learning. Students were asked to respond as appropriate on a five-point Likert scale (strongly agree to strongly disagree).

Examples of questions included were as follows: (VR refers to video recordings)

- VRs enhanced my understanding of the lecture content.
- VRs provided a revision aid to the Objective Structured Clinical and Practical Examinations (OSCPE)
- VRs stimulated my interest in the topic.
- VRs were boring & time consuming to watch.
- VRs served as a strong link between theory & practice teaching.
- VRs were extremely useful in my learning of communication skills.

Data collection via weekly reflective diaries:

Students were asked to complete a reflective diary each week. A standard template based upon the model described by Gibbs (1988) was used and comprised the following questions:

1. Evaluation of reflection on learning -What have I learned? How is it benefiting my practice?
2. Reflection on practice: Why was the event important? How did you feel? What went well? What went badly? What might you do different next time?
3. Action: What action, if any, will you take as a result of this learning?
4. Feedback: Did you receive any feedback?

Students were required to reflect on lectures/practicals each week for eight weeks on the topics covered and to submit an online weekly diary via the University's own virtual learning platform.

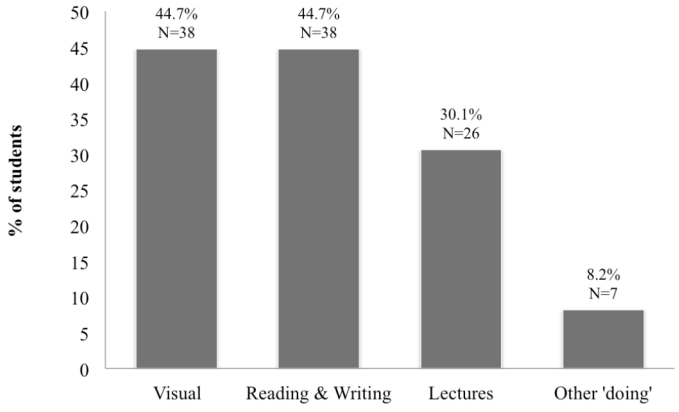
Results

Data collection via questionnaire:

Of the 85 respondents, 75% (n=64) were females and 25% (n=21) were males. Nearly 80% (n=68) of the students were within the 21 to 26 year age range.

Students' preferred methods of learning were varied (Figure 1)**.** Some 45% (n=38) expressed a preference for learning via visual display of learning material. These respondents also preferred learning via reading and writing. Overall, 31% (n=26) of respondents preferred lectures as the sole form of curriculum delivery and 8% (n=7) of respondents preferred the 'hands on' only approach to learning.

Figure 1: Students' preferred methods of learning



When respondents were asked whether VRs should be used in everyday teaching and learning, the majority (69%) responded positively (combined "strongly agree" and agree"), very few responded negatively (combined "strongly disagree" and "disagree") or were uncertain (Figure 2). Students were also asked for their views on the applicability of VRs to other subjects in the curriculum. These data are given in Table I and summarised as either positive, negative or uncertain responses in Figure 3. It is evident that all of the students viewed VRs as

Figure 2: Students' views on use of VRs in everyday teaching & learning.

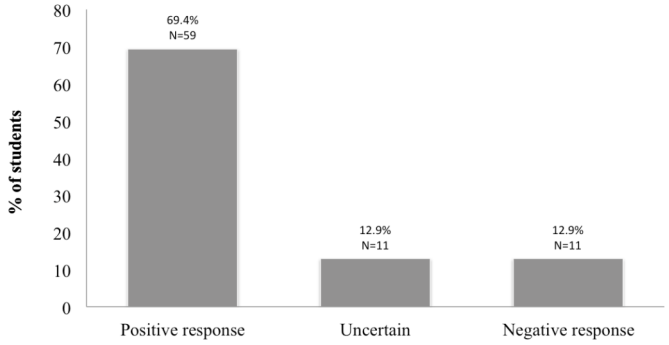
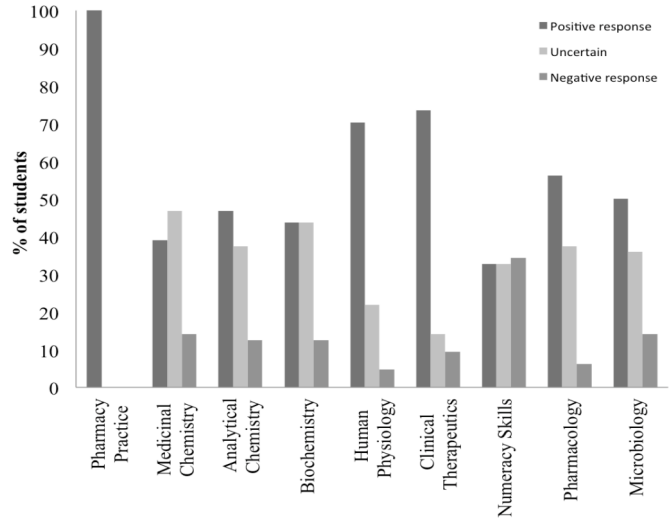


Table I: Students' responses to the areas in the pharmacy undergraduate degree where students would prefer to see VRs implemented as part of teaching and learning.

Subject areas:	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
	% Respondents				
Pharmacy Practice	75% (N=64)	25% (N=21)	0	0	0
Medicinal Chemistry	7.8 (N=7)	31.3 (N=27)	46.9 (N=40)	12.5 (N=11)	1.6 (N=1)
Analytical Chemistry	18.8 (N=16)	28.1 (N=24)	37.5 (N=32)	12.5 (N=11)	0
Biochemistry	15.6 (N=13)	28.1 (N=24)	43.8 (N=37)	9.4 (N=8)	3.1 (N=3)
Human Physiology	25 (N=21)	45.3 (N=39)	21.9 (N=19)	4.7 (N=4)	0
Clinical Therapeutics	40.6 (N=35)	32.8 (N=28)	14.1 (N=12)	9.4 (N=8)	0
Numeracy Skills	18.8 (N=16)	14.1 (N=12)	32.8 (N=28)	25 (N=21)	9.4 (N=8)
Pharmacology	32.8 (N=28)	23.4 (N=20)	37.5 (N=32)	6.3 (N=5)	0
Microbiology	25 (N=21)	25 (N=21)	35.9 (N=31)	4.7 (N=4)	9.38 (N=8)

Figure 3: Areas in pharmacy undergraduate degree course where students would prefer to see VRs implemented as part of teaching and learning material.



a useful tool in teaching pharmacy practice. Not dissimilar results were found with human physiology and clinical therapeutics. This is probably the result of prior experience of the use of this medium in these subjects. There was more uncertainty in the other subject areas but very few negative responses. Again, prior experience, or lack of in these cases, is likely to be a determining factor. Interestingly, the positive, negative and uncertain responses were essentially the same for the teaching of numerical skills. It would appear that students view this subject as one that is best taught in a more traditional fashion perhaps supported by worked examples available on-line. Students were also asked to provide more specific examples of concepts or tasks related to these subjects that might benefit from being supported by VRs. Students identified a number of topics which are listed in Table II. Whether these are related to how difficult students perceive them to be or is an indication of how they are currently taught remains to be established.

Table II: Suggestions by students for video recordings in various subject areas.

Subject	Videos recommended /suggested
Pharmacokinetics	Solubility of drugs within the human body; Examples of Pk calculations
Pathophysiology of disease states and conditions	Hypertension; Asthma; Diabetes; Infectious diseases
Dispensing	1) Law and ethics aspects of different types of prescriptions e.g. Controlled drugs (CDs), Methadone dispensing 2) Stages in dispensing where frequent dispensing errors occur 3) How to dispense different types of prescriptions e.g. register of CDs, private prescriptions. 4) Preparation of extemporaneous compounds.
Chemistry	Use of HPLC, NMR spectrophotometers.
Pharmacology	Plotting log dose curves; Sympathetic/ parasympathetic nervous system- drug receptor interactions.
Clinical pharmacy	Simulated ward rounds of case studies depicting different disease states
Microbiology	Aseptic techniques; serial dilutions; plating of cultures; mechanisms of actions of antimicrobials

Data collection via weekly reflective diaries:

One of the main reasons that the videos were developed was to increase student engagement with the teaching material prior to practical classes and subsequently for use as an adjunct to revision. This form of learning also enabled a cognitive presence as students were asked to fill out reflective diaries and reflect on their experiences for each session on a weekly basis. Excerpts from students' reflective diaries shown here corroborate the positive feedback received via the questionnaires. Reflection of the work carried out both during the practical classes and before and after the classes where students had used videos as adjunct material was well received as shown below.

Student 1:

- *"I also have to say that I found the tutorial videos online a huge help when studying for the OSCPEs, it was great to be able to see first and the correct ways to address the patient and the correct assessment techniques to use."*

Student 2:

- *"My initial thought of this assessment was a daunting one, as the exam date got closer I felt it was time to read through my lecture notes and once again watch the example videos made available via Studynet. These were extremely useful and reminded me not to use jargon and stay professional at all times."*

Student 3:

- *"As preparation for this task I reviewed all the notes I had made and the slides that were provided to us repeatedly to make sure I understood the theory behind these patient assessments. I viewed the videos again and found these to be very useful as they gave me a good idea of how these assessments are carried out and a useful preparation step I took was to practice these skills on peers, family, and friends."*

Discussion:

A majority (75%) of the student feedback was largely positive. The resources supported what they learnt in the practical sessions and because it was readily available through the intranet they could view the videos at anytime. This was important if they missed anything during the session, were unable to attend, or perhaps lacked the confidence to ask questions in the session itself. It also allowed them to prepare for forthcoming practical sessions and to practice in their own time.

Of the feedback received for the Patient Assessment module, the use of case studies to improve students' communication skills through the use of video recordings and playback of student-led scenarios was identified as the next resource to add to the existing bank of videos, so that students can observe and improve their skills by reflecting and identifying 'visually' their weaker areas. The aim is to devise a set of four to five role play scenarios which include pharmacists' interactions with and their role in identification of patients with mental health issues and/or learning disabilities. This was requested by the students and a majority of them felt this would be a useful addition to the module's learning resources.

Students' recommendations for the use of VRs in various subject areas were extremely valuable as this information identified areas which students most probably find difficult to engage with within their current mode of delivery via lectures. From the students' viewpoints, having 24 hour access to the videos meant they could visit the learning material when it suited them and they could use them more effectively to identify and address their individual learning needs. As a teaching resource, the videos were also useful for lecturers as they could recommend a validated, visual dimension to reinforce students' learning. In addition, the videos are sustainable in that they are cost-effective to produce, an engaging form of learning for the students and easily transferable across various modules within different disciplines. Students' independent learning is supported by this approach through provision of unrestricted access to resources to facilitate effective pre-session preparation. The added advantage of producing 'home-grown' videos is that specific learning material directed towards achieving specific learning outcomes can be addressed. Videos are also cheap to produce and created a positive working environment for the whole team both during and after production. Other advantages included bridging the gap between theory and practice and reinforcing the material learned in practical sessions.

In relation to use of videos in particular, other authors have also recognised that this form of blended learning resource has a potential application in constructivist learning (Shewbridge & Berge, 2004; Jonassen *et al*, 1999). For instance, the constructivist teacher's perspective would be to design the learning activities to be student-centred, with an active, constructive and co-operative sense of learning (Jonassen *et al*, 1999). The approach should also be authentic and intentional. If Bostock's (1998) three constructivist principles for using technology in learning are considered, the first two principles of *"active knowledge construction - making sense not just accumulating objective knowledge"* and that of "*indexed knowledge -linked to its future use; applied to realistic, relevant problems, contextualised, anchored and usable"* (p.225), were positively linked into our use of videos for delivery of adjunct visual material in learning and reinforcing of skills already learnt. In part the VRs also led to "*collaborative learning*" (Bostock's third principle) as students engaged in social negotiation of meaning, shared perspectives, testing ideas in practice and enhancing their practical clinical skills. An extension of the constructivist model is the cognitive processing of information based on the model of memory. Cognitive learning presumes that the learner's attention can be both focused and selective. Instructional videos can therefore be one of the determining factors in the learner's own pace of learning. The videos for this module are purely instructional, but not interactive, and this is an area the team intend to develop by including further directional narrative explaining additional aspects of patient assessment.

Limitations of this study

Our study has limitations in that this evaluation was carried out on only one cohort of students and in only one subject area. It would be interesting to compare the effectiveness of VRs as an adjunct to lectures in future cohorts of students and also in different subjects as suggested in Table II**.** Additionally consideration could be given to the impact, if any, of gender and age in the preference of using information technologies as a learning tool.

In conclusion, our research demonstrates students do benefit from and enjoy blended learning. VRs are a flexible aid to revision and enhance self-directed learning, allowing unlimited access with the added advantage of updating/ reviewing knowledge as and when required. Blended learning in general has become an indispensable tool for lifelong learning as well as integrating many areas of curriculum delivery into one educational training environment. Blended learning approaches, such as those described here, can improve students' overall learning experiences by engaging them in a relevant, innovative and interactive manner and clearly have a role in future developments in education and training for healthcare professionals.

References

Andrew, M. (2008) "Student evaluation of video podcasts to augment live lectures in Pharmaceutical Microbiology", *3rd International Blended Learning Conference*, Hatfield, 18 – 19th June, 2008.

Arabasz, P. & Baker, M.B. (2003) *Evolving campus support models for e-learning courses*. Educause Center for Applied Research (online). Available at: http://www.educause.edu/ir/library/pdf/ecar_so/ers/ERS0303/EKF0303.pdf. Accessed: August 2012.

Bostock, S.J. (1998) Constructivism in Mass Higher Education: a Case Study. *British Journal of Educational Technology,* **29**(3), 225-240.

Future pharmacists: Standards for the initial education and training of pharmacists. General Pharmaceutical Council (online). Available at: www.gphc.info/aboutthegphc/standardsandpolicy/index.aspx. Accessed: August 2012.

Garrison D.R. & Vaughan, N.D. (2008) Blended Learning in Higher Education. San Francisco. J Wiley & Sons.

Gibbs, G. (1988) Learning by doing: A guide to teaching and learning methods: FEU.

Grewal, S. (2009) "Developing the use of video sharing websites in the education of medical students in gastroenterology", *eLearning in Health: working together to enhance learning Conference*. University of Warwick, Coventry, UK, 16-17th July, 2009.

Jonassen, D.H, Peck, K.L. & Wilson, B.G. (1999) Learning with technology: a constructivist perspective. Upper Saddle River, NJ: Merrill.

Marquis, C. (2004) WebCT Survey Discovers A Blend of Online Learning and Classroom-Based Teaching Is The Most Effective Form Of Learning Today, WebCT.com (online). Available at: http://www.webct.com/service/ViewContent?contentID=19295938. Accessed: August 2012.

Shewbridge, W. & Berge, Z.L. (2004) The role of theory and technology in learning video production: the challenge of change. *International Journal on E-Learning,* **3**, 31–39.