# VIRTUAL LEARNING ENVIRONMENTS

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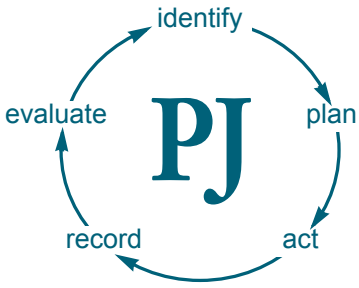
*This article highlights the main advantages and disadvantages of virtual learning environments and suggests some steps to create one*




## identify gaps in your knowledge

1. What are virtual learning environments?
2. What advantages and disadvantages does online learning offer?
3. What facilities are available for tutors and learners in virtual learning environments ?

This article relates to the teaching competency in the Royal Pharmaceutical Society's syllabus for academic pharmacy (see "Medicines, ethics and practice — a guide for pharmacists", number 26, July 2002, p107). You should consider how it will be of value to your practice.

Many tools have been developed to exploit the benefits of the internet or intranet, including packages called virtual learning spaces or virtual learning environments (VLE),[1,2] that can support face-to-face classes or even deliver entire courses online. Popular commercial software currently used to build a variety of different VLEs for higher education in the United Kingdom includes Blackboard (www.blackboard.com/) and WebCT (www.webct.com/). Typically, these web-based products provide a set of tools that allow instructors to upload learning material and put in place various communication links and feedback resources in a customised format. Figure 1 shows a supportive VLE set up relatively quickly using WebCT.

### WHAT VLEs CAN BE USED FOR

***Information dissemination*** There are many ways in which VLEs can be used to deliver or enrich a course. Often, the best approach is to start simply and gradually develop the VLE. For example, initially you may wish to use a VLE only as a quick and easy way to distribute course material and information. Building a simple VLE does not require commercial software but with some initial coaching, such products do make the process relatively painless for even the least adept IT user. In addition, they comfortably accept material in almost any format that the student can then view, download or print. Using a VLE, handouts or background information, images or video-clips and links to useful alternative websites can all be quickly and effectively circulated through the teaching group.


*Figure 1: A VLE prepared using WebCT*

***Enhancing communication networks*** Discussion boards, chat rooms and e-mail can all form part of virtual environments. Communication in chat-rooms where students can talk to each other virtually and tutors can add input and advice when required, can prove a good mechanism for peer support. Tutors can also participate and provide e-tutorials by agreeing set times in which they will be available in the chat room to discuss any issues or problems. Discussion or bulletin boards can be useful in addressing frequently asked questions; students can post their query on the board where the whole group can view it, and peers or tutors can then respond to this. The advantage of this set-up is that users can contribute to these discussions at any time suitable to them thereby enhancing flexibility.

In addition, designated groups of students can access a group page to upload and share files as well as communicate with each other. To facilitate course-work submission, "drop boxes" can be used to upload completed course material. Individual student webpages can also facilitate student-student interaction by helping to put names to faces in a group that does not meet regularly.

Despite all these benefits, personal experience of VLEs used in the Aston pharmacy course suggests that little use is made of these tools and students prefer to communicate by e-mail or have a face-to-face discussion. While e-mail correspondence can improve accessibility of staff to students in many instances and can be helpful in addressing some straightforward issues or arranging meetings, using e-correspondence can remove the personal quality of advice and support and many learners may not like such impassive contact. Indeed, a study by Schutte[3] investigating the application of virtual learning in higher education reported that students using virtual learning seemed more frustrated, this stemming from the inability to ask tutors questions in a face-to-face environment. However, the author also noted that this frustration might have resulted in more involvement between peers, who formulated study groups to "pick up the slack of not having a real classroom".

***Providing practice and feedback*** VLEs can be used to provide examination practice. Both Blackboard and WebCT programmes allow you to create a database of self-assessment questions that generates quizzes and provides student and tutor feedback. Such quizzes can have open access or only be made available at a set time for examinations. VLEs can also be used to provide general practice and feedback for students, for example, online tutorials or videos that end with a self-assessment quiz and that focus on areas where students would appreciate further practice can be added. Alternatives to standard quizzes, such as crosswords and image-building, where diagrams or flow-charts can be organised and labelled, can add variety and increase student motivation and participation and are now available in many VLE programmes.

***Computer-assisted assessment*** With growing undergraduate numbers computer-assisted assessment (CAA) can dramatically cut down an academic's marking time. Most VLE packages have provision for

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**TABLE 1: ADVANTAGES AND DISADVANTAGES OF USING VLES**

| Advantages of VLEs | Disadvantages of VLEs |
|---|---|
| Learning can be delivered at any time to almost any IT accessible place | Off campus access can be slow and expensive |
| Learning material can take a variety of forms (eg, text, graphics, audio, video) | A VLE can become a "dumping ground" for material not designed for online delivery |
| Learning material can be updated easily | Learning material can become outdated |
| Student-student and student-tutor interactions can be stimulated | Online support must be planned carefully to avoid tutor overload |
| Problem-based learning can be easily incorporated and automated responsive feedback can be provided | Both tutors and students may need training on the administration and running of the VLE |
| VLEs can account for a learner-centred delivery strategy that can take into account different learning styles | Increased learning expectations — often an initially simple VLE is expected to become more sophisticated and this requires more tutor administration |

tests to be available with automated marking and immediate feedback. The course tutor can specify when the students can undertake a test and the number of times they can access it.

There is now an assortment of questions that can be used in CAA, but these are generally objective test questions, for example:

- Select an answer from a set of choices, eg, true/false, etc
- Select an area of the screen (a "graphic hotspot") — in this form of question the correct area of a diagram should be selected by "clicking" on it
- Give short numeric or text responses (one or two words)

Computerised marking can be considered appropriate with such questions because no judgement has to be made about the correctness of the answer. In addition, a question bank can be created, with questions being randomly chosen to provide a unique combination of questions for each assessment. Although objective test questions are more frequently used in CAA, subjective testing does exist for some forms of course work[4] and research continues in the use of computerised assessment of student essays. Because this will require subjective judgement, the feasibility of such systems must be questioned. However, one useful application of computer assessment of student essays is in the detection of "cut and paste" plagiarism. This form of plagiarism, where text is lifted from internet sources, is a rapidly growing problem. There are various software programmes available to download (eg, www.plagiserve.com/sample.htm and www.canexus.com/eve) that can detect matches between parts of text and internet sources. However, the simplest tool for detecting this form of copying is to use a search engine such as Google to search for matches to a suspect phrase or sentence. To detect plagiarism from published articles, suspicious text or key words can also be checked against MEDLINE abstracts or online journal databases such as www.ScienceDirect.com

Alternative outlets for online plagiarism are the so called "paper mills" (eg, www.cheathouse.com and www.geniuspapers.com). These sites can provide "a database of thousands upon thousands of term papers, book reports and essays" for an access fee. Although none of the sites I visited recently offered a significant "export" into pharmacy courses, many do offer, for an additional fee, a customised essay service tailored to your requirements.

***Student management*** VLEs can also be used to keep records of student performance in quizzes and assessments, track progress or simply record how often a particular area of a site is accessed.

## CONCLUSIONS

VLEs can provide flexible resources that effectively deliver or enrich learning experiences to an audience with a wide variety of learning requirements. Students are given the freedom to learn where, when and how they want and active learning can be encouraged. Table 1 gives advantages and disadvantages of VLEs. Basic systems can be easily incorporated into most courses and many require only modest IT skills. However caution should be applied; sometimes instructor enthusiasm and ever increasing student expectations can result in a high maintenance VLE that requires more time and effort than originally foreseen. Furthermore the lack of face-to-face interaction and student social contact, should be considered and, for most, a combination of traditional and virtual learning may be the best approach.

When first setting up a VLE there are several issues you may wish to consider: initially you must identify if your VLE will support or deliver a course. The latter will demand a far higher level of input and complexity and therefore it may be better to start with a simpler set-up that provides support to an established traditional course. This can include the typical features: diary, calendar, course material, communications (eg, e-mail, bulletin board) and self-assessments, all of which can be put in place relatively quickly. It is also important to consider what you want your VLE to provide. Time should not be spent duplicating information by adding material already available to the students elsewhere because this will have limited learner use. Ideally, there should be a mixture of preprepared content and online learning activities.

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## action : practice points

1. Visit the Learning and Teaching support site (www.ltsn.ac.uk), which reports case studies on the development and implementation of virtual learning spaces.
2. Try to use an online learning site (eg, http://medlib.med.utah.edu/WebPath/TUTORIAL/TUTORIAL.html#1 or http://education.jlab.org/ ). What advantages and disadvantages did you find?
3. Read about future developments in VLEs by visiting the site in Reference 2. How do you think higher education will be accessed in 10 years?

## evaluate

How could your learning have been more effective?
What will you do now and how will this be achieved?

## REFERENCES

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