

Few biomedical scientists could have missed the recent proliferation in online training programmes listed under CPD credit-rated activities within these pages. One of the first to appear was that offered by the BioMed Online Learning Consortium, and here Professor Patricia J Harvey provides an overview of the development of this innovative course.

Working together

The BioMed Online Learning Project

In this age of the knowledge economy, many have been captivated by the opportunities inherent in the internet to deliver learning, and a whole new 'eLearning industry' has emerged in the last few years that offers a wide range of products and services and an overwhelming mass of raw information. However, access to information does not constitute learning. For this to be achieved, students need to be encouraged to talk about what they are learning, write reflectively about it, relate it to past experiences, and apply it to their daily lives. Inevitably, this means taking a course.

The BioMed Online Learning Project started life in the late 1990s as a partnership between academic practitioners skilled in delivering high-quality training using web-based eLearning methods, and specialists and practitioners from the health sector with a firm grasp of the needs and skills gap in hospital and public health laboratories. Their goal was to create a suite of eLearning courses that would cater not only for the growing demand for continuing professional development (CPD) for registered personnel, but also provide supplementary training for registration for those holding non-approved degrees, and academic accreditation towards a professional Masters-level qualification.

The hope was to improve staff retention and to provide opportunities for career advancement for healthcare professionals. At another level, it would test whether or not eLearning methods could be used to train staff in busy hospital laboratories, and to highlight the problems that might arise.

eLearning courses

Several eLearning courses have sought to provide training by offering text or multimedia instruction, asking the student questions and providing automated feedback and new instructional material based on the

student's answers. However, in the absence of student-tutor contact, and the feedback that is vital to enhance intellectual commitment and encourage students to think about their own values and plans, these courses attract a high attrition rate. They also tend to be difficult to update.

Instead, the BioMed team decided to use the internet as a means of rapid global communication between online students and their tutors, while at the same time using it to point to online resources (libraries, journal articles, databases), computer-aided design packages, interactive web pages and so on, to support a structured learning approach to the materials supplied. The BioMed team would be able to use the internet to update course materials rapidly and, in so doing, allow students to respond to new developments in the field.

However, development of an online course of this nature is not a trivial undertaking; clearly, it would require significant inputs in both cost and time, and would also require contributions from a variety of different experts at different stages during its development. For example, apart from the need for web-page designers and subject matter experts, licences and copyright clearance might be required because materials would be published on the internet.

Courses would need to be evaluated to ensure that they met quality assurance and accreditation standards. Arrangements would need to be made to identify a web server on which the courses could be located and to ensure that both students and tutors could access the course materials. The courses would need to be maintained and updated regularly, particularly if they included links to other websites over which course designers might have no control. Registry support would be needed to enrol students and legal advice would be required on course ownership and copyright of materials.

Working together

Encouraged by publication of the *NHS Plan* in 2000, and, a year later, the new set of education and training goals for NHS staff groups in healthcare science, the partnership launched the BioMed Online Learning Consortium between 17 NHS Hospital Trusts, the Health Protection Agency and the University of Greenwich in 2001. It also invited representatives from the IBMS and Health Professions Council (HPC), as well as from the newly formed NHS University (NHSU) to serve as observers on the steering committee. A business plan secured the necessary funding from six workforce development confederations, as well as from the Health Protection Agency (HPA), and the challenge to develop and test a suite of online training modules for biomedical scientists was launched.

During 2002–2003 the partnership worked together to oversee the successful development and delivery of seven electronically delivered short courses (Table 1), together with a bespoke online training module for course authors. As few healthcare specialists have experience of online teaching, let alone course design, this course guided course authors on how to design for the online medium and helped them appreciate the problems of computer access as a student; recognise the level of frustration that is experienced when web links do not work; and experience the power of interaction between student and tutor.

All courses were subject to trials by workplace students employed by the NHS or HPA, and, in a pilot launch, three of the courses were delivered twice to workplace students. Courses were delivered wholly online, with a recommended – not compulsory – face-to-face workshop offered at the beginning and the end of each course.

Courses were validated by the University of Greenwich in 2003 and accredited

subsequently by the IBMS. They now provide successful students with 30 credits at Master's level (currently, a full professional Master's programme in biomedical sciences comprises 120 taught credits, together with a practical project of 60 credits) and 100 IBMS CPD credits in the 'Vocational' category, together with an additional 25 credits in the 'Personal' category when supported by a reflective learning log. An IBMS CPD Diploma is awarded on completion of two modules, each accompanied by a reflective learning log.

Online advantages

Properly implemented online courses offer a number of advantages for healthcare professionals:

- They encourage active learning through online debate, and facilitate collaboration on projects in an information-rich, tool-rich environment
- They encourage reflective practice and allow students to share ideas and respond to each other's reactions at a distance
- They enhance written communication skills
- Students are given the opportunity to learn new ICT skills and are encouraged to think with them later in the workplace.

BioMed Online Learning courses are now offered on a regular basis. Each course is supported by an instructional team comprising a tutor with specialist subject knowledge in the course they are tutoring; the product manager, who liaises with those in the student's workplace environment and university technical support office to troubleshoot technical issues as they arise; the administration manager, who enrolls and registers students with the university central support offices, liaises with workplace managers and online tutors, and also takes on the role of personal tutor to provide additional encouragement and support; and the academic coordinator, to monitor quality on behalf of the university.

New course titles in the pipeline for 2005 include: The Role of a Quality Manager; Gene Structure and Function; Automation and robotics; Management of Healthcare-Associated Infection; and Training Trainers. For more information, go to www.gre.ac.uk/online.

Partnership has played a key role in the success of the BioMed Online Learning Project. In the early days, with few precedents in place for developing online courses, the BioMed Online Learning Consortium needed to gather information and experiment with ideas. Working together has meant that problems have been shared and the responsibility for the outcomes has been a joint one.

The remainder of this article represent individuals' views of and experiences with the BioMed Online Learning Project.

Table 1. BioMed online learning courses (12-week duration, 40–60 hours learning).

• Quality Systems Management
• Point-of-Care Testing
• Healthcare-Associated Infection
• Lung Disease
• Renal Disease
• Diagnosis of Breast Cancer
• Analysis of Nucleic Acids
• Online Course Design for Course Authors

The Managers' Tales

Online learning offers many positive aspects for staff who would like to continue learning, or return to it, without the long-term commitment and effort required of a Masters' degree. For me, the benefits of this approach are legion.

It is unobtrusive as very little input is required of laboratory management. It is relevant CPD activity, and generous in terms of the credits on offer. It is clearly motivational as an unusual amount of interest has been generated among my staff, and it is a good way of returning to learning at one's own pace.

The department also benefits from links forged with other learners, which brings new ideas and approaches, and a broad range of knowledge. Contacts made during online learning will invariably persist beyond the end of each course, and can enable laboratories to build up a 'user group' of colleagues with similar approaches, equipment and problems.

Currently, the courses are free of charge, thanks to financial support from the North East London Workforce Development Confederation, which has championed the BioMed Online Learning project on behalf of the London workforce development confederations. If this ceases, however, cost could be a drawback with the level of interest currently being generated and only limited funds available.

Tim Stephens, Harold Wood Hospital, Romford, Essex

Current Clinical Pathology Accreditation (CPA) assessments pose a new challenge to already overworked staff in laboratories. The NHS is traditionally poor at equipping staff with the right tools to do the job when they take on more responsibilities or different roles. Reliance is often placed on experience and finding the right books to gain necessary knowledge. I recommended the BioMed Online Learning course to our departmental quality manager after having searched for quality management courses on the web and found very few.

From the learning outcomes specified on the website, it seemed that the BioMed course would fulfil a number of important criteria for the department (eg providing a

framework for improving the quality system being developed at the time, and a greater understanding of CPA requirements).

As a manager responsible for recommending training, online study was something that I had no previous experience of and it posed a number of challenges. The NHS IT network with its firewalls was a hurdle that needed to be overcome at an early stage, and persuading the IT department to allow access to the online course was resolved by highlighting the fact that BioMed Online Learning courses were not just for biomedical scientists but were also for nursing staff and other healthcare professionals.

New ground rules for online learning had to be set. Online courses offer study-time flexibility, but support from the department was required to ensure that time off for study was given. I also needed to consider the fact that staff may not have done university-based study for some time and that I might need to provide a framework that encouraged and supported the necessary self-study that was going to be required. Management of time for study / work without compromising on-going laboratory targets was essential. Online learning required dedication by the student and regular review back in the workplace, particularly to assess motivational needs.

Although as expensive as a traditional MSc if taken to completion, many staff do not wish or need to do a full MSc. The online modules provide relevant, accredited short courses that fulfil CPD requirements and provide the tools required for the job. The learning outcomes of the course significantly helped preparation for Clinical Pathology Accreditation (CPA) assessment and the laboratory improvements occurred at a faster rate than would have occurred without the training. Real-time experience helped the student progress through the course and the cascade of learning helped the whole laboratory during preparations for the CPA visit.

Danya Cohen, Hammersmith Hospital, London

I was in the first cohort of students taking the BioMed online module in quality management. I chose this module as we had an impending CPA assessment arranged for one of the laboratories at the Royal Marsden Hospital (RMH) and this would be our first visit under the new standards. I needed to ensure my knowledge and training in audit and quality management were up to the task of meeting the new standards.

In order to achieve simplification and standardisation, I aimed to produce documents applicable to all areas of pathology. In addition, my quality manager (elect) took the course at the same time so we were able to provide mutual support. The course was offered free of charge as a result of generous support from the North East London Workforce Development

Confederation (NELWDC) to the BioMed Online Learning Consortium, although finance was not a particular issue. Subsequently, another member of the RMH pathology quality management committee has taken the course.

As a student, I found the course quite demanding: there was a lot of work to get done quickly to meet tight deadlines. Additionally, there was the time needed to join online discussions and comment upon other students' work. However, the content of the course was just what I needed and it reinforced previous training and consolidated areas where I felt weaker. I used the assignments to produce live documents ready for the CPA assessment, which were all viewed very positively on the day. I gained an IBMS CPD Diploma from this course and also credits that can be used to build a professional MSc. The range of modules offered could produce a very interesting and relevant professional MSc without having to commit to a continuous course of study over two years.

As a manager, there are obvious advantages to online study. Obviously, students remain in work, so staffing levels are protected. It is also useful for staff to be able to interact with colleagues elsewhere, without having to go to another site, and the diversity of hospitals and institutions represented means that there is very broad experience to be shared. The in-course word processing software does not include a spell-checking tool, so students must take care over spelling and punctuation, which, to my mind, is important.

The course provides much background material that can be used by other staff at their leisure, and also links to many useful websites. I would recommend online learning packages both to students and to laboratory managers. However, the student must be very motivated and needs to be supported and encouraged to get all assignments done on time. For some hospitals there may be a funding issue: RMH provides a generous study leave budget but the course is around £700, which may seem expensive. I'm planning to do the POCT module next...
Sue Alexander, Royal Marsden Hospital, London

The Students' Tales

The CPA inspection for my laboratory (microbiology) was scheduled for June last year. I had been in post as quality manager for six months and really felt the need for guidance. The BioMed Online Learning Quality Systems Management course was due to start and I was fortunate to receive funding from Hammersmith Hospital NHS Trust and secured a place.

From the very beginning, the course was relevant to my new role and to the procedures I was putting in place together and the documentation required. The Quality Policy, which was an early assignment, was immediately implemented in my laboratory. For a later assignment, we had to perform

different types of audit and so had the opportunity to explore the evidence required to meet the CPA standards. A useful concept learned was that although CPA provides audit templates, it is important to adapt these for the particular needs of the laboratory, and we were encouraged to do this.

Although I had some experience of tutoring at a distance, I had never been a 'student' on a distance-learning course. The induction day familiarised me with the online nature of the course – the activities, the discussion postings and the chat rooms – as well as providing an opportunity to meet each other face to face. Subsequently, the structure was easy to follow and submitting assignments via the internet was straightforward.

From the start, the workload was high and demanding of time. This made it important to keep to the timetable and meet the deadlines, although I frequently questioned the estimated five hours per week of study! As the course progressed and the assessments became more complex, I felt there was little time for consolidation and reflection. However, some months after the end of the course, the course materials and my assignments continue to provide the framework for my work.

Finally, contact with other students made the course enjoyable and discussions with them was one of the highlights of the exercise.

Susan V Want, Hammersmith Hospital, London

I was in the third cohort of students taking the BioMed Online Learning course in Quality Systems Management. I had little quality management experience when I recently took up my post, but was keen to learn as much as I could. A Google search for 'quality systems management' + 'course' returned a hit for the BioMed Online Learning website, where I obtained plentiful information about the course outline and student comments.

I had no previous experience of distance learning, and few preconceptions about online courses. Fancying myself as something of an IT guru, I was not put off by the requirement for IT literacy. I hoped the course would inform me about quality management in general, relate to CPA standards and pathology laboratories, and show me the practicalities of audit and user surveys. The course met all these expectations, and although the assignments were demanding of time and effort, they yielded results (eg audits) that could be applied immediately in my workplace.

I found that basic IT skills were required for the course, and the online chat tool, which was used for prescheduled chatroom sessions, required each student to locate their IT security manager (someone every quality manager should already know) for NHS Trust firewall settings to be modified. Support from the BioMed IT specialist, as well as from the tutor and course

administrator, was always prompt and helpful.

The format of the course allowed me to fit study and course participation around my other commitments, but I would advise anyone considering a course of this type to arrange access to the website from both home and work. If you do this, however, it is necessary to employ a robust system (eg rewritable CDs) for transferring files from one computer to another to ensure that course assignments are synchronised.

In summary, I found the course to be of high quality, convenient, applicable and I would have no hesitation in using an online course to obtain training again.
Gary Cheung, King's College Hospital, London

The Tutors' Tales

One thing I find interesting and encouraging, having run the course four times, is the way that the students bond and work together. Although they have met at most only once, for an afternoon's workshop, they begin to come together as they work through the course. They share work experiences and learning experiences, so that they help each other to learn and, in a sense, teach themselves as a group. They will tell the others in the group how things are done in their workplace, and the lessons that they have learned at work. They will also share resources such as websites, articles and textbooks that they have found useful for their coursework. In this way, the course becomes a framework on which the students work together and build their learning of the subject. Importantly, the learning is from the students' current experiences and from up-to-date resources.

Alan Munday, online tutor for Point-of-Care Testing

Tutoring online was a new experience for me, and one that I would recommend to others. It is particularly rewarding because students learn how to contribute to the course via discussions and presentations, thereby increasing the quality of the course. Individual and encouraging online messages from the tutor are helpful and reassuring for students. Prompt evaluation and feedback of submitted assignments lets the student progress through the course at a steady pace, and students who may require further assistance are identified at an early stage. In addition, students who would not normally contribute in a classroom situation find that they are able to express their ideas more easily because of the close tutor/student interaction that is developed in this written medium.

Dorothy MacKenzie, online tutor for Healthcare-Associated Infection

The Diagnosis of Breast Cancer course has been run twice. The use of two online tutors appears to work well and allows us to develop a good online relationship with our students, whom we may not meet in person. 'Real-

time' chat sessions with the students via the internet offer many benefits. They allow us to provide advice and information in a timely way to meet the students' needs, as well as to generally 'have a chat' with the students and pick up any problems as the course progresses. The sessions also benefit the students in getting to know each other, which encourages them to help and work together through the course, and it alleviates any feelings of isolation. Students are encouraged to participate fully in discussing learning methods and useful websites/papers etc in a discussion forum. As the students do a large part of their research for the course content on the internet, we often find they are fully up to date on the subject. They appear to be good at dismissing sites that may not contain accurate information. All students so far have been very motivated and have been a pleasure to tutor through the course.

Gillian Donald/Dr Steve Humphreys, online tutors for Breast Cancer

I have been a tutor for the Quality Management Systems module twice and found the second time around more straightforward than the first. The time commitment as a tutor is substantial and it exceeded the number of hours I originally anticipated. Most of my work for the course is done at night or at weekends. The deadlines for submitting work are short, which means that one has to keep up with grading work and provide feedback quickly – this helps to keep students motivated, and is particularly important in the early weeks of the course. The students I have tutored are keen and their hard work is evident from the standard of work submitted. Some students are more active than others and tutors can monitor students' activities to see how much effort they put into the course. The level of contribution varies, as some students submit more discussion postings or attend more chat sessions than others. I have enjoyed being a tutor and feel satisfied that I have contributed to this new and modern method of learning.

Kurt K Djemal, online tutor for Quality Management Systems

The Administration Manager's Tale

Although the BioMed Online Learning modules are delivered remotely, it is amazing how well you can get to know the students as

individuals. We invite all students to attend a half-day introductory workshop, to learn how to navigate their module and have the opportunity to meet the BioMed team, their online tutors and fellow students face-to-face. However, with many students from overseas and the far reaches of the UK, the modules are designed to work just as well when a student cannot attend the introductory session.

My relationship with the students can be crucial when resolving any difficulties that they may encounter. It is important for students to have someone 'outside' the module who can be used as a point of contact or who can liaise between the student and their tutor when a problem arises due to illness, a broken modem or whatever else it might be.

Each student has a different motivation for taking an online module and so each has different goals to meet. For some, the module covers a particular area of expertise that they need for their career, while others need to find an interesting course at the appropriate level to fulfil their CPD requirements. Some students wish to

complete the Professional Masters in Biomedical Science (four Online Learning modules plus a work-based project). The BioMed Online Learning modules are an ideal way for students to experience studying at Master's level before committing to a full MSc. Finally, some students just love to study new things and find these online modules a great way to continue their studies while working full time.

Our aim is to support all students so that they complete their module successfully, meet their individual goals, and have some fun along the way.

Cathy Ronan, Administration Manager, BioMed Online Learning

Professor Patricia J Harvey is Professor of Protein Biochemistry at the University of Greenwich. If you are interested in participating as a student in trials of these courses, or would like to become a partner of the Consortium or an author of a course, please contact Cathy Ronan (email c.e.ronan@gre.ac.uk).

BIOMED ONLINE LEARNING CONSORTIUM
Addenbrooke's Hospital, a Cambridge University Hospitals NHS Foundation Trust
Central Manchester and Manchester Children's University Hospitals NHS Trust
Great Ormond Street Hospital for Children NHS Trust, London
Guy's and St Thomas' NHS Foundation Trust
Hammersmith Hospitals NHS Trust, London
Health Protection Agency
King's College Hospital NHS Trust, Denmark Hill, London
Lewisham Hospital NHS Trust, Lewisham, London
Maidstone and Tunbridge Wells NHS Trust, Kent
Medway NHS Trust Maritime Hospital, Gillingham, Kent
North East London Workforce Development Confederation
Queen Elizabeth Hospital NHS Trust, London
Queen Mary's Sidcup NHS Trust, Sidcup
Royal Brompton Hospital and Harefield NHS Trust, London
Royal Free Hampstead NHS Trust, London
South Manchester University Hospitals NHS Trust,
St Mary's NHS Trust, London
St Bartholomew's and the Royal London NHS Trust
University College London Hospitals NHS Trust
University of Greenwich