

Case Study

Final year eLearning Projects

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Subject area: Final year research projects, eLearning

This case study has been developed from data gathered through observations of the teaching component, interviews with the tutor, and a student focus group

Background

This case study reports on the practice of eLearning Projects (ELPs) offered for the last 5 or 6 years as a research project option for 30-40 final year students on a wide range of degree programmes in the Faculty of Life Sciences at the University of Manchester. Over their final year, students learn the skills associated with ELPs – how to plan, design and develop online resources for learning. They design and develop an e-learning resource – e.g. a virtual experiment, online tutorial or a problem based case history or scenario for a selected target group. A key feature of ELPs is that students determine an evaluation strategy, possibly related to a hypothesis based on the potential effectiveness of the resource, and design an ‘experiment’ to conduct this evaluation – e.g. on test/control groups, thereby gathering qualitative and quantitative feedback for analysis. Students submit a project report with a similar format to lab-based project students. The project counts for 30 credits and the assessment is linked to both the performance of students during their project (20%), as well as the resource they develop (20%) and their final report (60%).

Prior to developing their project resource the students undertake and submit a 10 credit literature review to provide scientific depth to their research. Further background and training is provided through a training course in project skills covering learning design and evaluation, the use of specialist software applications, questionnaire design, and aspects of elearning and educational theory. This is currently delivered via a series of two hour workshops in a computer-cluster, run twice-weekly over 14 weeks, led by the Course tutor and the elearning manager. The face-to-face taught component is complemented by supporting materials and online tasks in Blackboard that provide practise in skills and integrate peer support and interaction. This group interaction is intended to mimic the social interactions other project students may experience in the laboratory and helps the students form social networks for mutual support (Topping, 2005). Each student is allocated a project supervisor to provide academic advice and guidance on scientific content, and mark and provide feedback on their work. A small elearning team provides students with support for software applications.

Reasons for introducing this teaching method

In common with universities elsewhere, a significant minority of students are attracted by the opportunity to carry out research in a non-laboratory setting. ELPs were introduced to provide students with an interest in the communication of science and the application of technology to teaching and learning the opportunity to undertake an alternative form of project. ELPs are designed to enhance and demonstrate students’ problem solving and critical thinking skills (and those of their target audience) and aim to provide them with a similar and rigorous research experience to their laboratory counterparts. Experience has shown that marks for ELPs are comparable with those for other project types.

Lecturer Perspective

The tutor has a long-standing interest in engaging students in problem solving, enquiry and data handling, and the application of the scientific method, particularly regarding practical and project work. With funding from the University's CETL, the Centre for Excellence in Enquiry-Based Learning (CEEBL)¹, she sought to combine e-Learning and Enquiry-Based Learning (EBL) in ELPs. The ELP course framework is purposefully designed with an enquiry-driven focus based on the 'language of inquiry' model (Justice *et al.*, 2002) – with the aim of promoting flexible and student-directed learning, critical thinking and collaborative learning. In the early years the tutor observed a tendency for project students to focus on conveying maximum content via their resource and difficulty in concentrating on the learning design aim of stimulating enquiry in their target group of learners. This led her to modify the 'active-learning' training course, incorporating additional sessions to nurture students' creativity; students work in groups and are encouraged to experiment with a range of creativity tools to generate ideas for their learning designs (Wakeford, 2009). For the tutor the module is enjoyable and rewarding; students do well and many succeed in producing high quality learning resources which are adopted in the undergraduate curriculum.

Students' perspective

Students clearly felt they had benefitted from undertaking ELPs and identified several aspects of their design as superior to the laboratory projects undertaken by their peers. For example, the student peer-review and peer-support element in the online discussion environment "*helped improve critical analysis and evaluation skills*". Students used "*each other to get advice and feedback*" in class and via the discussion boards, and noted using the discussion boards because they found this valuable rather than simply because their contribution to them was assessed. They greatly appreciated the flexibility of ELPs and the ability to access materials remotely that allowed them to study at a time and place to suit them. This meant they spent more time on their projects and found it easier to fit their project work around other aspects of their study/ life: "[you] *can just sit down and do it when you want... online ... [making it] 'enjoyable... Do more as a result'*". While they valued the opportunity and independence of directing their project work students found the training course and workshop sessions "*really important*", helping them to plan and organise their work successfully. Students identified ELPs as enabling them to develop a range of technical, communication, learning design and self-management skills, e.g. they gained an "*understanding of how to effectively communicate*" and "*apply science in a way that stimulates*". Many also identified having developed knowledge of their scientific topic: 27/31 students (87%) strongly agreed or agreed that completing the literature review had helped in this respect. One student noted having chosen a topic thinking they knew it well; in reality they had identified gaps in their knowledge, "*fundamental gaps*", which they had plugged. Students expressed a sense of responsibility and desire to generate quality resources, which they saw positively as their legacy to future students; projects were "*more rewarding, having an impact on other people*". Students had actively chosen an ELP, viewing them as an opportunity to learn new skills rather than simply a way to escape the lab.

Issues

Students identified the project experience as having been enjoyable and valuable but intense. They expressed a preference for being able to select their final year project earlier i.e. in the second semester of their final year so that literature search and writing of the literature review could take place over the summer/prior to the final year of study. Such changes to the scheduling of projects in the Faculty of Life Sciences are already planned for the subsequent cohort of students. Gaining access to, and feedback from, target groups for evaluation of their resources (the data generation aspect of their research) had also proved challenging for some students.

¹ <http://www.campus.manchester.ac.uk/ceeb/>

It was felt this situation could best be improved via individual project supervisors, possibly with the participation (feedback) of other students being made compulsory; new guidelines for supervisors clarifying their responsibility for advising students regarding target group recruitment have been issued for next year.

Benefits

Students are able to pursue project work that is challenging, self-directed and of interest to them, they research a bioscience topic in depth and gain experience of communicating bioscience effectively by delivering information or concepts to a particular target audience. At the same time they develop a range of technical and transferable skills, which they recognise as enhancing their future employability – “*this is really useful... [I] can make a website for anything now... [project experience has] lots of applications*”. The quality of the e-resources produced by students is frequently high, as evidenced by the increasing number of these hosted by supervisors in their teaching materials; two students to date have had their work published in *Bioscience Horizons*² and a third has had an article published in *Anatomical Sciences Education*³. Examples of student projects are available online⁴. Many aspects of the design of ELPs have been used successfully in the development of the Education Project option also available to students locally.

Reflections

The ELP format provides a popular, valuable, intensive research project experience, enabling students to develop valuable technical and transferable skills. It could provide a rigorous and workable research project option for bioscience departments elsewhere. The only issue for other departments may be the availability of technical staff for the provision of student support. In addition to providing a valuable project experience for students, the generation of quality elearning resources for use in teaching represents a useful outcome for staff supervising the project students, and other students.

References

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² <http://biohorizons.oxfordjournals.org/>

³ <http://onlinelibrary.wiley.com/doi/10.1002/ase.214/abstract>

⁴ <http://www.ls.manchester.ac.uk/undergraduate/teachingandlearningresources/elearning/elearningprojects/>