# E-learning practice

## Case Study

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<th>Case study title</th>
<th>Aspects of pollution in Europe: An e-learning package</th>
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<tr>
<td>Author’s name</td>
<td>Georges Dussart</td>
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<td>School / Department</td>
<td>Faculty of Business and Sciences</td>
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<td>Institution</td>
<td>Canterbury Christ Church University</td>
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<td><strong>Background</strong></td>
<td>Canterbury Christ Church university was recently granted university status but has had degree awarding powers for many years. The university was founded as a teacher training institution and the importance of pedagogy permeates all the faculties of the university, including the Faculty of Business and Sciences. The development of creative teaching methods is central to the ethos of the biosciences team who take a keen interest in the development of such methods. The e-learning described below was developed in 2002 and currently forms part of our Level 3 curriculum and is delivered in the second semester. The course is popular and numbers are growing. Currently the class size is 30. The material was designed to be applicable at MSc level, but has yet to be used for this purpose.</td>
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<td><strong>The challenge</strong></td>
<td>The challenge was to produce an e-learning package in English which could be used remotely or proximally by undergraduate BSc and MSc students. We receive ERASMUS students from abroad who want to study pollution biology in the UK but who, because of various other commitments would not be able to attend all timetabled sessions. For example, they may be timetabled for English language classes which clash with bioscience classes. We also wanted the package to work for our students abroad. For example, a host university might not be able to provide courses which exactly matched our degree curriculum. Therefore, with an appropriate learning package and with the agreement of the host university, our students could work on the package under guidance but at a foreign university. There is a problem of obtaining practical skills in an e-learning based course of study. We wanted to find a partial solution to this issue.</td>
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| **Intended outcome(s)**   | The objectives were to produce an e-learning package which:-  
  • was flexible enough to be used at undergraduate and post-graduate level  
  • could be used with minimal supervision  
  • included both formative and summative assessment  
  • could be easily updated  
  • was easy to navigate and use  
  • needed minimal external literature support  
  • was based on the research expertise of the contributors  
  • could be adapted for (i) independent- (ii) face-to face |

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1 This template is based on one developed for the JISC Effective Practice with e-learning project (http://www.elearning.ac.uk/news_folder/innoprac).
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<th>Established practice</th>
<th>The plan</th>
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| We had already produced an e-learning package on biodiversity conservation which had the following disadvantages, identified through staff and student evaluations:-  
(i) It was prepared via an Authorware package which needed specialised knowledge for its production. It was therefore difficult to update.  
(ii) It used extensive pop-ups which, according to students, impeded their learning. They preferred to follow routes via hyperlinks (this was in the early days of e-learning).  
(iii) The structure was too complicated. It was difficult for the user to get a conceptual map of the package. Indeed, preparing such a map was the subject of the first tutorial and the associated homework. If the structure had been intrinsically clear, this concept mapping would have been unnecessary.  
| The plan was to identify the structure of the discipline (pollution biology) and then try to take a novel approach so that our e-learning package did not merely repeat the structure of many of the excellent texts in the field. Although we wanted the package to exist as an integrated whole, we did not want to discourage students from consulting the mainstream literature. Thus, instead of going through the various kinds of pollution effects (....of toxic metals, heat, sewage etc), we concentrated on the phases of pollution and the way polluting materials could move through phases, exerting biological effects as they moved.  
(ii) As the instigator, coordinator and major author, I wanted the package to be easy to navigate and therefore used a combination of (i) a userguide and (ii) a hyperlinked index page (called a contents page in the package). The essential, most-used feature of the userguide is a hyperlinked teaching and activities timetable; the userguide also includes a general introduction to the package, and an overview of the structure. Unlike the previous biodiversity package, it is not necessary to understand the conceptual map of the package to use it effectively.  
(iii) As for the previous biodiversity package, on the grounds that students might not have easy access to library resources, in order to allow the e-learning package to be used independently, we included primary literature as 'Support documents'. These could be used in different ways, depending on whether the package was being used at under- or post-graduate level. Some of the support documents described the personal research of the contributing writers.  
(iv) In order to ensure that the work burden was not too high for students and to give them fast turn-around on homework assignments, we took the view that instead of having a few, large assignments, there would be many, small assignments, the latter being typically 100 words long. We took this approach because if you are tutoring a student who is doing such a package rather than following a taught course, you do not want to receive an large piece of work for marking. Also, not all assignments are marked. However, students are required to keep a logbook to show that the assignments have been done.  
(v) We carefully identified what learning outcomes we wanted the students to achieve from practical work within the context of pollution biology at Level 3 (for example:- ability to design and execute an experiment, use taxonomic keys to species level, apply multivariate statistical techniques to the data so obtained etc). The subject lends itself to independent working. Open-ended assessed practicals were part of the programme. Students had to design... |
execute experiments based around (among others) the following topics:-(i) a quantitative investigation of fungal colonisation of fruit, (ii) the effect of acid on plant community development on buffered and un-buffered soils, (iii) r and K concepts or Grimes triangle as models of weed colonisation of disturbed land (iv) comparative investigation of heat island effects in settlements of different size, (v) estimation of antifoulant used on boat hulls in a marina and its implications for imposex. Although there is a timetable, students manage these tasks independently.

Division of work

I called and managed several planning meetings in which we identified the overall approach and then delegated writing responsibilities. As a widely experience pollution biologist, I wrote about 60 per cent of the materials. Most writers wrote in Word and, as Editor, I then translated their documents into HTML using Dreamweaver. Although I could have used Frontpage, it introduced too much extraneous code and it was easier to translate and update directly in html. The module was trialled with students and staff and then revised before its full inception.

The e-learning advantage

There are a number of advantages:

(i) I support this course with tutorials and log books, and assess the students’ work in the form of multiple small assignments. There is a fast turn-round which means I can easily see if students are not keeping up and help them with any problems. In evaluations students are enthusiastic about the small assignments and fast turn-round. They prefer this to the alternative.

(ii) The assignments are submitted by email. They can therefore be easily electronically monitored and cycled through the system. There are few issues of plagiarism from the web since the small assignments relate to particular, focussed issues in the module. The possibility of copying from each other is a perennial one in teaching, and is not limited to e-based learning.

(iii) My face-to-face contact on this e-learning programme is about thirty per cent of the contact I would use on similar non-e-learning courses. However, I subscribe to the view that “for good learning, you must be able to smell the teacher” and therefore ensure that we have regular tutorials in which we go through parts of the course which they have found difficult. The module has not yet run entirely remotely, though it was designed to do so. Nevertheless, the course team felt that in teaching and learning, personal contact was always better than remote access.

(iv) I insist on the students forming self-help learning support groups. This helps their learning, which reduces the need for face-to-face teaching. It also ensures that the students socialise their learning appropriately. They keep a diary of meetings in their logs, which are assessed. In this way, I ensure that such meetings are operating appropriately. At the first, orientation meeting of the module, I oversee the formation of the self-help groups. I try to ensure that each group involves 2 students; with groups of three or more, the additional students tend to watch rather than do. However, I leave it up to the students as to whether they might coalesce the pairs into something bigger while still maintaining their pair responsibilities. Mature students often do this.

(v) In questionnaire and discussion evaluations, students have said
they like the ‘discovery’ aspects of following hyperlinks, especially when this means they can be led into the support documents in a way they might not do if they had to go to a library and look up the item.

(vi) The package is well hyperlinked internally which means that students can easily get an integrated overview of the subject. A selection of the most positive and negative student comments from evaluation follows:

a. “The lectures are interesting and put the work in context. The logbook is useful. The way the course is designed is new and after three years of the same set-up is refreshing.”
b. “It was useful in addition to the...CD to have contact time.”
c. “It is good to have all the information in one place, and the CD was easy to use. Interactive lectures were good.”
d. “Quality of teaching was high with good diversity of subjects and good advice.”
e. “I feel motivated because of interesting subjects and lectures.”
f. “CD very useful but sometimes too much.”
g. “Not enough lecture time.”
h. “Having three experiments to attend to throughout the course is too much, although they are useful.”
i. “There should be decreased work and more lectures.”

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<th>Key points for effective practice</th>
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<td>Keep it simple! Use a hyperlinked index page in the form of a list as the main starting point. Don’t use icons for this. For intelligent, quick users such as undergraduates, icons make hyperlinked movements slow and clumsy. Even in the main body of the package, use hyperlinked words rather than icons. Each item in the index should be hyperlinked to the relevant place in the Userguide timetable, and to the appropriate section in the main body of the text.</td>
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<td>(b) Use a hyperlinked Userguide in parallel with the index. This should include a list of what to do and when, hyperlinked to the relevant sections and hyperlinked to the location if that topic in the index.</td>
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<td>c) Use support documents to prevent the main part becoming too heavy.</td>
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<td>d) Keep the structure essentially linear – not in the form of a spider diagram. The former is conceptually easy to grasp for the learner. The latter much more difficult.</td>
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<td>e) Use a simple drawing package to create images. Most packages such as CorelPaintShopPro are too weighty. You don’t need a jumbo jet if all you want is transport to the corner shop.</td>
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<td>f) Every screen page should have a hyperlink back to the appropriate point in the index. In this way you can fulfill one of the most important adages of e-learning, “Every part should be accessible to every other part within 5 clicks of the mouse.”</td>
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<td>f) Again, for emphasis KEEP IT SIMPLE! You will eventually need to correct, update or amend the material. A complicated structure will</td>
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dissuade you from doing this and the programme will fossilise.

**Pitfalls**

I underestimated how much work would fall on my shoulders as the coordinator of authors who had less expertise in producing e-ware than I did. It meant that I had to translate everything from Word or handwritten documents into html and inevitably had to insert the hyperlinks in their writing. I was also responsible for the overall appearance and structure of the package and the underlying protocol for its use. This was extremely time-intensive on top of my other work. In future, I would get authors who were more 'html' aware.

**Conclusions & recommendations**

Having cut our teeth on the biodiversity e-learning package, we have produced a valuable and creative learning tool which addresses some difficult issues of teaching students who are not at home, whether they are our students abroad, or foreign students who are our guests.

The package has been constructed simply and linearly, and is therefore easy and effective to use, which has enhanced its undoubted popularity with students. Although it has reduced the number of contact hours needed to deliver the material, it has not been completely dissociated from face-to face teaching. Associated tools such as the logbook are essential to the success of the teaching and learning.

Good learning and teaching is a dialectical process. The structure and processes by which this e-learning package is delivered have addressed this issue, which contributes to both its effectiveness and its popularity amongst both staff and students.

This module has recently been run with 30 students. With much larger numbers, the assignment turn-around might become more problematical; I would find other ways of assessment, for example getting student groups to peer-mark other groups’ work.

**Additional information**

I am happy to provide further information on our experiences of developing and embedding this package. My email address is gbd1@cant.ac.uk