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Planet

Planet is the biannual publication of the Higher Education Academy Subject Centre for Geography, Earth and Environmental Sciences. Its aims are to:

- Identify and disseminate good practice in learning and teaching across the three disciplines of Geography, Earth and Environmental Sciences.
- Provide a forum for the discussion of ideas about learning and teaching in the three discipline communities.
- Provide information for readers on Subject Centre activities and on related resources, conferences and educational developments.

Planet welcomes contributions on topics related to learning and teaching in GEES subject areas.

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ISSN 1473-1835

EDITORIAL

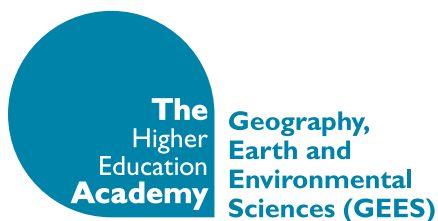
I hope you enjoy reading this, the 18th issue of *Planet*—my first issue as Editor. Again, we have put together a series of articles on topical issues from our ‘GEESer’ contributors from around the UK.

You will find a number of articles particularly devoted to e-learning and IT related issues with a particularly ‘GEES’ focus, including podcasting, virtual learning, virtual work and fieldwork technology. We have also delved into a number of employability related topics, including Personal Development Planning, work placements, and careers relevance. This is closely followed by articles relating to student learning, such as investigating the affective domain and encouraging student engagement in sustainability issues. Some of these articles are also reports from small scale projects funded by the GEES Subject Centre.

As usual, we have included an outline of events coming up in the next year, and we look forward to seeing you at some of these!

I hope you enjoy this issue of *Planet*, and I welcome your future contributions.

Elaine Tilson, *Planet* Editor
and the GEES Subject Centre Team



Are you engaged yet?

The GEES Subject Centre exists to help all professionals in geography, earth and environmental sciences in higher education

The Centre provides:

- regular events on topical issues in learning and teaching in HE in the UK
- subsidised workshops for newly-appointed lecturers in GEES subjects
- free departmental workshops on a range of topics
- small-scale project funding
- the biannual publication, *Planet*
- a website including a resource database
- an enquiry service

Keep up to date with activities by signing up to the the GEES Subject Centre Jiscmail list, a moderated news and information service for everyone involved in learning and teaching in the GEES subjects in higher education. To view the archives, join or leave this list, or change your details, go to: <http://www.jiscmail.ac.uk/lists/GEES.html>

E-learning in the UK: Perspectives from GEES practitioners

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Abstract

This paper summarises the findings from a survey to establish the current use, re-use and development of e-learning materials by GEES practitioners based in universities in the UK. The research was funded and co-ordinated by the Higher Education Academy Subject Centre for Geography, Earth and Environmental Sciences. Motivations to develop e-learning materials in the GEES community primarily related to improvements in personal and teaching efficiency, but there were numerous barriers impeding the realisation of such benefits. Barriers included limited technical and pedagogic knowledge, a lack of significant departmental and institutional support, and concern over the time required to develop new materials. The subject specificity of e-learning materials was also found to be an obstacle to sharing and re-use.

Introduction and context

This paper reports on a UK-wide survey of practitioners in the Geography, Earth and Environmental Sciences (GEES) relating to their experiences of e-learning as a teaching strategy. The paper has two main aims: firstly, to present a review of the use of e-learning approaches in the GEES disciplines in the UK; and secondly, to report on what support practitioners viewed as necessary to enhance their use of e-learning. The research is specifically focused on the UK and has been facilitated by the GEES Subject Centre.

At the UK level, there have been a number of initiatives within the higher education sector to promote e-learning as a means to empower and engage learners (Department for Education and Skills, 2005; HEFCE 2005). Universities in the UK are increasingly under pressure to 'do more with less'. In particular, an emphasis on teaching 'smarter' rather than 'harder' has emerged, which has highlighted e-learning, at least potentially, as an efficient teaching approach. Most, if not all, universities in the UK now have online material to support student learning, with many offering degrees, or at least specific elements of degrees, entirely online. Furthermore, the current generation of students entering University bring with them a wealth of online experiences and skills, being part of the modern day 'net generation' (Oblinger and Oblinger, 2005). It seems, therefore, that the trend towards e-learning and related initiatives in the UK, combined with increasingly technology-aware students, is creating a new set of expectations for technology to be part of teaching practice and the learner experience.

In this paper we define e-learning as "learning facilitated and supported through the use of ICT" (JISC, 2004, p.8). 'E-learning tools' can be defined as something you use to deliver course content, whilst 'e-learning resources' can be defined as the actual course materials.

The research presented in this paper compliments and supplements our previous research into the use of e-learning in the GEES disciplines. Two surveys in particular provide useful context for this paper (Fletcher, et al., 2007 and France, et al., 2004). The themes that can be drawn from these previous surveys are, in summary, as follows: 1) that academics in the

GEES disciplines require evidence that the time spent developing e-learning materials will derive tangible overall time savings and no loss in the quality of student learning; 2) that many academics have little or no experience of using e-learning technologies nor designing pedagogic strategies appropriate to that particular technology; and 3) that the level of support from universities for the development of e-learning materials is variable and uptake of e-learning approaches largely dependent upon the personal skills and interests of the academic. The research presented in this paper takes these themes and examines what support practitioners in the GEES disciplines in the UK would find beneficial.

The primary source of data presented in this paper was a questionnaire survey distributed to GEES academics in the UK. The survey consisted of 12 open questions and three closed questions. The questions were structured around the following themes:

- The rationale for and type of e-learning approaches used by practitioners
- The challenges of using e-learning experienced
- The support offered to practitioners for using e-learning in their teaching at various levels within their university
- The opportunities for and willingness to share e-learning materials with other practitioners
- The role that could be played by the GEES Subject Centre in supporting e-learning practice

The data have been analysed both quantitatively and qualitatively. All direct quotes from respondents have been anonymised in order to maintain assurances of confidentiality.

Survey results

The rationale for and type of e-learning approaches used by practitioners

The primary rationale for using e-learning could clearly be grouped into benefits for teachers and benefits for students. The use of e-learning was considered to be a response to the realities of modern higher education and a more diverse student population, with benefits for teachers being largely pragmatic rather than pedagogic. Examples of benefits included: accommodating increased student numbers; being able to deal with problems quickly through mass communications; being 'available' to students regardless of location (of either party); and providing a reduction to workload through avoiding frequently asked questions; and the provision of automated feedback within online assessment. The enhanced communication capacity was perceived as important, as "*students like it, especially when they can get a more personal (if online) response, rather than in a class discussion*". From a pedagogic perspective, it was commented that feedback from online exercises prior to a classroom session could inform the content and approach of the face-to-face teaching.

E-learning can "*maximise opportunities for offering teaching support to students who may be dispersed in time and place. It increases flexible delivery of teaching and learning, increases opportunities for collaborative working and groupwork, and widens accessibility*"

A secondary rationale for the adoption of e-learning techniques related to the preferences and interests of the academics involved. Many respondents demonstrated an interest in technology generally, which produced a willingness to apply it to teaching. However, there was a suggestion that respondents tended to see e-learning solutions to their practical problems, rather than more conventional alternatives, due to this prior interest in technology.

There was a general acknowledgement amongst respondents that e-learning is “*increasingly what learners expect to feature within their learning experience and resonates with their growing use of electronic media for interaction and communication*”. Benefits to students were much more pedagogic in their emphasis as the following quote illustrates:

Without exception [e-learning packages] offer a committed teacher tools that are better suited to teaching and learning than chalk and talk. Indeed, I will go so far as to argue that web-delivery, with tutor support done properly, is, in many senses, better than face to face [teaching]. Mostly, this arises because the tools permit students to learn at their own pace and in a style that suits them (or at least with additional options). Even 'lecture notes on the web', an idea subjected to scorn by dedicated e-learning specialists are, in my view, a massive advance for many (for example, those with dyslexia or non-native language speakers).

It was considered that the use of e-learning approaches facilitated active participation in lectures through reductions in pressure from note-taking, and through confidence derived from formative exercises prior to the classroom session. It was also thought that the use of e-learning accommodated different learning styles, helped to develop time management skills, gave students employability skills in terms of technological literacy, provided self directed learning opportunities, and was inclusive of disabilities and language barriers. It was noted that some students chose not to participate in the e-learning opportunities, which had the potential to create significant difficulties, as there was often little alternative non-technological support offered.

The challenges of using e-learning

The main obstacle to using e-learning approaches was the investment of time required in learning how to use new software, to develop new materials, and to design appropriate pedagogic strategies. There was some scepticism over the actual time savings made through using e-learning approaches, with respondents feeling constrained by their own technical limitations and expectations and by the lack of recognition by their institution for the additional time required.

I sometimes think that the time that is supposedly 'saved' by using e-learning is artificial/illusory.

Challenges also related to student attitudes to e-learning, such as de-motivation through reduced personal contact, the potential for non-participation in the learning process, and the adoption of a “*passive 'entertain me' mentality*”, preferring the “*sage on stage*” learning method. It was also acknowledged that some students were “*technophobes*” or had “*techno-fear*” and would not engage with e-learning approaches. The increased opportunities for communication, however, were described as “*sometimes difficult to*

control as expectations increase”. More pragmatically, there were concerns related to the ownership of the content of e-learning approaches, copyright issues over material used in e-learning and the re-use of material elsewhere, and compatibility issues between different hardware and software.

The support offered to e-learning practitioners

The main source of formal support for e-learning cited by respondents was within their own university, although informal support also came from their academic departments. The majority of respondents were ‘self-taught’, with early adopters of e-learning approaches often asked to run workshops for colleagues.

Institutionally, my university is quite good in terms of support. But this is still only enough to get many people started... Support staff would need to be increased significantly, in order to increase the number of people regularly using and creating 'higher order' e-learning materials for their teaching.

The GEES Subject Centre was also seen as providing support, although this tended to be through published articles, workshops and conferences, rather than practical support or training. Overall, there was more structured support at institutional level. However, a significant increase in departmental and institutional e-learning-dedicated support staff appeared to be needed.

The sharing of e-learning resources

The electronic format of e-learning resources is what makes those resources convenient to share and adapt for re-use. Respondents felt that sharing and reuse would be particularly useful given the concerns over the time commitment required to create new e-learning materials. Indeed, one respondent commented that “*this is a vital step if e-learning is to realise its potential but it is not a trivial one*”. Scope for sharing materials “*both within and between institutions*” and “*developing materials collaboratively*” was considered as “*entirely possible*”, and widely recognised amongst respondents. In particular, it was considered that first year generic material was most suitable for sharing, but that as the focus of study became more specialist and specific to individual academics, opportunities for sharing and adaptation reduced. This was likened to generic problems with the transferability of teaching materials as “*the same problems apply as with paper-based learning resources. No textbook (or e-learning resource) ever quite captures the slant a particular lecturer wants to present*”. It was also acknowledged that most shared e-learning material would need to be adapted prior to its use in an alternative context.

Respondents were asked to consider how effective sharing and re-use of e-learning materials could be encouraged. A central resource base which would both develop new material and facilitate the organisation of shared materials was identified. This central base would need to manage copyright and ownership issues; acknowledge and reward resource developers; and provide a searchable database. More broadly, it was also noted that there may also be scope to ascertain the actual (as opposed to perceived) benefits of e-learning and promote successful practice in e-learning through staff development events. The GEES Subject Centre was cited as an obvious potential provider of these resources.

How could the GEES Subject Centre further support e-learning practice?

Support from the GEES Subject Centre to develop and use e-learning teaching strategies was generally welcomed by respondents. The opportunity to discuss and exchange ideas with other practitioners was the primary source of support cited as potentially useful.

I have learnt much more when I have had the opportunity to engage/meet with other practitioners and share experiences.

Other potential mechanisms of support suggested included short practice guides, case studies of practice and 'good ideas', short training events, an online journal of good practice, an online discussion forum, and development of guidance on the issues of re-use and sharing for support staff.

The specific e-learning services that respondents considered the GEES Subject Centre well placed to provide included an image/video/animation bank (70%) (an image bank is currently under development at the Subject Centre), a shared learning resource repository (55%) (JORUM – a UK online repository of learning and teaching materials is now available), and a question bank (48%). There was consensus that "a good starting point would be lots of good quality shared images" and that centralisation may help alleviate some of the copyright issue concerns. However, it was commented that any resource bank "must be easy to search [and be] time efficient"; the host must be able to "guarantee the quality of the deposited material"; and the security of the resources must be considered, "especially question banks [in order] to prevent student access". It is interesting to consider the extent to which existing search engines are providing this service already, albeit without access to material stored within university systems.

In terms of the reality of committing GEES Subject Centre resources to sharing and re-use, respondents were not entirely positive about whether it would be an effective use of resources. "Raw materials" such as video clips, images, animations, etc. would be welcomed, but it was thought that specific learning materials, for example, would become outdated very quickly and that in most instances it would be "better to start from scratch".

Conclusion: Implications for the GEESs community

In order to consider fully the implications of this research for the GEES community, the conclusions of the survey presented in this paper are incorporated into, and combined with, the conclusions arising from the previous surveys on e-learning use in the GEES disciplines in the UK, undertaken by the authors. The synthesis of conclusions suggests three main implications for the GEES community.

Firstly, it would appear that, at present, it is technological innovation that is driving the use of e-learning rather than a pedagogic rationale. This is a concern as, in the view of the authors and most of the relevant literature, e-learning, is a distinctive teaching approach with its own pedagogy (e.g. JISC, 2004). The specific pedagogic conditions and constraints of an e-learning approach need to be considered carefully before its adoption, and evidence from the research presented here suggests that this is not the case. The implication for the GEES community

is that the pedagogic considerations of e-learning require greater attention. This research has shown that a national body (in this case the GEES Subject Centre) would be well placed to deliver such support.

Secondly, there are significant barriers to the uptake of e-learning both for staff and students. In terms of staff barriers, time to produce or adapt materials is a key constraint. Many staff are concerned that they lack the skills and knowledge to develop appropriate and effective e-learning materials, both in terms of technology and pedagogy. There is a need to investigate opportunities to share and re-use e-learning resources and to facilitate their use or reuse in pedagogically appropriate ways. Student barriers (as perceived by academic staff) relate to the potentially de-motivating effect of learning something new, which in this case, is an e-learning process and the potential lack of skills of students to effectively participate in this process. Little research exists in relation to student attitude to e-learning in the GEES disciplines at present, but this requires further investigation in order to ascertain the validity of this concern.

Thirdly, there is the encouraging observation that support for e-learning within the GEES community is emerging at a variety of levels, including within specific academic groupings within universities, at institutional level, and nationally through the work of organisations such as the GEES Subject Centre in the UK. If e-learning is to play a serious role in educating future generations of GEES students, then this support must not only continue, but be enhanced further.

Acknowledgements

This research was funded and supported by the Higher Education Academy Subject Centre for Geography, Earth and Environmental Sciences. The authors would also like to thank all of the GEES practitioners that participated in the research.

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Virtual lecturing: Delivering lectures using screencasting and podcasting technology

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Abstract

Delivery of lectures using web technology is now an accessible and relatively straightforward option for University of Stirling (University) teaching staff. In this study, conducted with a 2nd year Environmental Science module, a series of 8 lectures were delivered via screencasts and podcasts. Feedback from the students via a questionnaire was extremely positive, with flexibility and the ability to repeat lectures cited as the main advantages. However, caution must be exercised in that this is not a mechanism for replacing face-to-face teaching, but is used to provide additional material or to free-up time for more discussion sessions or practical-based teaching.

Introduction

The recent increase in the accessibility of personal broadcast technology has opened a wealth of new opportunities for learning and teaching, which can enable us to meet the emerging needs of our students and address issues resulting from the changing dynamic of the student population. These issues include the requirement for more flexible learning, as students need to work increasingly long hours in paid employment to meet the cost of their education. The number of students who are making their own recordings of lectures either as a result of dyslexia or other learning difficulties, is also on the increase.

What is screencasting and podcasting?

Screencasts are, effectively, a digital recording of your computer screen, and can include an audio commentary. Screencasting is being increasingly used to record Powerpoint presentations using software such as MicroSoft Producer for Powerpoint or Camtasia Studio, which act as plug-ins to Powerpoint allowing users to run and control the software from within the Powerpoint environment. These programs also have the ability to record a WebCam image to accompany the slide and audio recordings. Screencasting has significant advantages over audio recordings in that the presentations can include diagrams, photographs and videos. This is an important consideration for visually rich subject areas such as the Earth and Environmental Sciences, where visual aids are often highly important for the understanding of much of the subject material.

A podcast, in its truest sense, is a digital media file (audio or video) which is distributed and shared over the web, so that users can *subscribe* to digital content such as a lecture series, for example. This is then automatically delivered or downloaded to a personal computer. Files can either be played back on a computer, or transferred to a personal media player. The term 'podcast' can refer to either the media file itself, or the way in which it is delivered.

Where is it being used in higher education?

Screencasting and podcasting are increasingly being used within a Higher Education setting to deliver a range of educational material. In the US, many Universities, including Yale and Princetown, are podcasting their public lecture series, while institutions such as Stanford and UC Berkeley are podcasting lectures from a range of modules. Indeed, Berkeley has taken the step of making all of its recorded lectures series freely available to the public (<http://webcast.berkeley.edu/>). In the UK, the University of Wales, Aberystwyth, was the first University in the UK to create podcasts of its lectures (Thomas, 2006). Formal studies on the effectiveness of screencasting and podcasting in HE are few and far between, but a number of studies are now beginning to emerge (e.g. Chan and Lee, 2005) while ongoing research through the IMPALA project aims to explore the beneficial effects of podcasting and to deliver pedagogical models of podcasting for student learning in Higher Education (www.impala.ac.uk).

Production and delivery of the online lecture series

In this study, part of the lecture series for a second year Environmental Science module in Earth and Landscape Evolution was delivered via screencasts and podcasts. The rationale behind the study was to explore the student experience of using and learning via this type of technology, and to determine the most appropriate and popular delivery formats for online lectures.

Traditionally, the module consists of 20 lectures, five practical sessions, and four help sessions, which are designed to support the students in completing the assessments and for discussion of the course content. The module is supported by a WebCT based VLE. There were 105 students enrolled in the class. A mid-semester online test was used to examine the students on the content of the electronic lectures.

The first eight of the 20 lectures were delivered electronically. The lectures were recorded prior to the start of the course using Camtasia Studio, desktop microphone, and WebCam. A short introduction to the course and the electronic lecture series was also recorded.

Using Camtasia Studio, the lectures were produced as high and low resolution screencasts. The audio file was exported to GarageBand (a Mac based software bundled with iLife for creating podcasts) to create high and low resolution MP3 audio files and enhanced podcasts (as mpeg4 files) which include chapters and images. The rationale behind producing such a wide range of formats was to make the material as accessible as possible, and also to determine which format the students preferred.

The introductory lecture was placed on the entry page of the WebCT site for the module. The page contained full instructions for viewing and downloading the introductory e-lecture, with instructions about what to do if they had problems accessing the screencasts or podcasts. As teaching commenced, two lectures

were placed online each week and an e-mail was sent to inform students they were available. The lectures were released in all the formats produced, along with a downloadable ZIP file of the high resolution screencast. Pdf files of the Powerpoint slides used in the presentations were also provided. Students were seen face-to-face in the first week during a practical session where informal feedback was solicited. No students reported any access problems and initial feedback was positive.

The first lecture in this series can be viewed or downloaded from: http://www.sbes.stir.ac.uk/env3e3/e-lectures/lecture_1/



Student feedback and response

At the end of this part of the course, an anonymous questionnaire was put on to the WebCT site and students were encouraged to fill this in by way of a prize draw for respondents, with the chance to win an MP3 player or a £20 iTunes voucher. In total, 94 students completed the questionnaire.

In terms of the format, 86% of the students watched the high resolution screencast and 20% downloaded and listened to the audio files (note that some students accessed the lecture material in more than one format). Of those that watched the high resolution screencasts, 58% watched them in the computer labs on campus and 40% watched them off-campus using a broadband connection. Of those that downloaded the audio files, 90% accessed the high resolution MP3 file or mpeg4 files.

The students were reminded that the questionnaire was anonymous, and were asked when they had accessed the lectures during the course. 45% accessed all or most of the lectures within a week of release. 34% started to access them regularly, but then fell behind, and 21% only accessed the material during the week before the exam.

Finally, the students were asked if they liked having lectures delivered in this way. 85% of the students responded positively, while 8% were ambivalent, and 7% responded negatively. When asked if they would like more lectures to be delivered in this way, 76% responded that they would, 17% were not sure and 7% responded negatively.

“It is certainly the best revision aid you can get ... your whole lecture all over again.”

The students were also asked open questions and were given a text box in which to record their answers. In terms of what they liked about having the lectures delivered in this way, the key responses were flexibility, and the ability to pause and rewind—either to catch up in their note taking or to repeat sections they didn't fully understand. Students also thought it was a useful revision tool. Some key comments included:

“The flexibility was great as my little boy finishes nursery at 6 so I didn't have to attend the 5 – 6 lecture”

“I even managed to do one of them during my lunch break at work one weekend when I was really busy and hadn't had time during the week.”

“I liked being able to pause and rewind bits so I could write down notes. I really struggle writing notes in lectures”

“You could take your time, go back over things as many times as you liked and you could use the Internet as you worked for research on topics.”

“I liked the idea of having it online so you could watch it when you wanted. Sometimes because of 9 o'clock starts you feel tired and don't take in as much.”

“...no one coughing/talking/distracting you from a lecture.”

“It is certainly the best revision aid you can get ... your whole lecture all over again.”

In terms of what the students didn't like about the lectures, the key complaints were that it was easy to fall behind with them. Unless students were very motivated, they often put off watching them until another day. Students also noted that it took them much longer to access the lectures in this way as they were pausing and rewinding the recordings which meant that it often took them twice as long to go over the material than it would have taken them to just attend the lecture. Some students complained that they felt isolated from the lecturer and from their fellow students and that they missed being able to ask questions. Some key comments included:

“It was easy to put off doing a lecture, as you knew you could do it later and this could lead to leaving it to the last minute and cramming.”

“I fell very behind with the lectures and it also took about double the time of the lecture to actually watch it as I became obsessed with catching virtually every word.”

“I found I was writing every detail down which took forever, whereas in the real lecture you write key points you need to know.”

“I didn’t like the fact that you couldn’t ask questions during the lecture. I also didn’t like the lack of bonding between the lecturer and student.”

“Not being able to ask what something meant. Not being able to ask fellow students if they understood a lecture i.e. in the same boat as each other therefore reducing your confidence. Not being able to mix with other students and get to know how everyone is doing with regards to assignments etc.”

In terms of technical problems, some of the students complained that the files were often slow to download, and that they had problems accessing a free machine in the computing labs during busier times. A couple of people said that they couldn’t get the MP3 files to work on their own MP3 players, although nothing was said at the time.

Finally, we asked the students what they thought we could do to improve the e-lectures. The main answer was that they would have liked more face-to-face contact, possibly through a weekly discussion/question and answer session, or by having more practical sessions. Students also requested the lectures on a DVD, if possible, and the inclusion of a trouble-shooting page.

Discussion and conclusions

In general, the feedback from the students was overwhelmingly positive, with only 7% of students not in favour of this form of delivery. Flexibility was one of the key criteria for the students, as they could then view the lectures at the time of day most suited to their learning style, rather than be constrained by lecture times. Students also reported learning more, being able to take better notes, and gaining a better understanding of the lecture material. However, the mid-semester test that examined the content of these lectures had not previously been run in a similar format, so it is not possible to judge whether this anecdotal evidence is matched by the students’ exam performance in previous years. Further work is needed to assess the validity of this finding.

While the feedback from the students was very positive, there are issues that need to be addressed if we are to continue and extend lecture delivery in this format. Students miss the interaction not only with the lecturers, but also with the other students. Clearly, this method of teaching is not to be used to replace face-to-face teaching time, but it could be used to provide much of the theoretical material for a course. This could free up staff time to introduce more small-group teaching, discussion sessions, and practical-based teaching into course modules. This may also address the issues of motivation, if weekly follow up sessions are provided. Students will also need coaching in how to take lecture notes from this form of delivery. It is not appropriate or effective for them to be writing down every word the lecturer says, but this is clearly a temptation when the lectures can be re-wound and replayed.

In terms of the preferred viewing and download formats, the majority of the students were accessing the high resolution screencasts, podcasts and MP3 files. While some commented that download times were slow, clearly the quality of the audio and video recordings was paramount. Despite the fact that the students were strongly encouraged to report technical difficulties if they encountered them, none did at the time. This conflicts

with the evidence that a few students did experience technical problems, which they reported in the questionnaires, and indicates some reluctance to admit to or seek help for difficulties when they arise—perhaps a more detailed troubleshooting guide is required.

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GEES Subject Centre

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Reflections on using podcasting for student feedback

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Abstract

As part of a year three module, at the University of Chester (University) assignment feedback was delivered by podcasting technology. This offered a novel approach to feedback that had the potential to be timely, constructive and individualised. This paper focuses on student perceptions and attitudes to podcasting assignment feedback (PAF) using data gathered from a pre- and post-podcasting questionnaire survey and a focus group discussion. The results suggested that the use of PAF provided enhanced opportunities to deliver both generic and individualised feedback to students, and an improved student learning experience. Less obvious 'side-effects' included the importance of the tone of oral delivery of the podcast, and the less superficial nature with which podcast feedback was apparently treated by students.

Introduction

Many students arrive at University with some form of technological gadgetry, which may include a mobile phone, MP3 player or laptop. They form part of the modern day 'net generation' of students (Oblinger and Oblinger, 2005), who bring with them a wealth of online experience and skills that can be utilised by today's Higher Education practitioners, and, therefore, incorporated into student learning activities.

Technology, has been used in education for many years with developments in computer technology in particular, creating new frontiers in geography education (Nellis, 1994). A recent UK strategy document *Harnessing technology transforming learning and children's services*, commented positively on the role of technology, stating that "a greater focus on technology will produce real benefits for all" (Department for Education and Skills, 2005, p.2). However, HEFCE (2005, p.6) more cautiously states that, "focus should be on student learning rather than on developments in technology *per se*, enabling students to learn through, and be

supported, by technology." The institutional framework in the UK is therefore supportive, provided that the technology is applied in a pedagogically-sensitive context.

This short article presents the interim findings of a study to explore some of the initial student evaluations of podcasting assignment feedback, and will identify the positive and negative attitudes of using podcasts. In this article, 'podcasting' refers to the process of downloading audio files to computers. These files can be automatically loaded onto portable devices, such as iPods, that are virtually universally available to students. Podcasting has been used before to enhance learning and teaching activities, including lectures (Brittain *et al.*, 2006) and more informally to enhance the student learning experience (Edirisingha, P and Salmon, G., *in press*). The opportunity offered by podcasting is to harness the technology to improve feedback to students, as demonstrated in Race (1999, p. 27), who stated "feedback quantity and quality are probably the most important factors in enhancing students' learning".

Rationale and methods

Providing students with effective feedback is a perennially challenging issue with staff and students alike, and is a vital component of their ongoing learning. Podcasting offers a novel approach to feedback that has the potential to be timely, constructive, and individualised. It also provides an opportunity to support a range of learner styles and increase student engagement through reflection. In contrast, contemporary opportunities for feedback using standard University proforma can be perceived as brief, mechanical and one-way. By using podcasting, there is a potentially significant opening for student-practitioner dialogue, enabling the students to communicate their own questions and responses to the initial feedback given through an invitation to reply at the end of the podcast.

Podcasts were recorded directly into a hand held iPod with a microphone attachment. The audio files, around two to three minutes in duration, were automatically downloaded and compiled into a podcast. Each enhanced podcast (with supplementary images) consisted of two sections. Firstly, generic group feedback on the assignment, and secondly, more specific, individual feedback. Podcast assignment feedback (PAF) was created after each assessment point. In total, 76 podcasts (each no more than 2Mb in size) were uploaded onto the University's homegrown Virtual Learning Environment (VLE) or Internet Based Information System (IBIS), and were situated within each student's personal development portfolio (PDP) and made available to download. The PAF could be played online or transferred to a MP3 player. Students without a suitable MP3 player were able to borrow an iPod from the Department. An automated email was sent to each student communicating that feedback was available.

This paper draws on the experiences and attitudes of a group of 26 students (10 males and 12 females aged 20-25, and four females aged over 30) who studied a Level 3, Semester 1 module (15 credits) 'Climate Change and Natural Hazard Management'. The module was assessed through an individual e-postcard (33%),



Photo Caption: Students Naomi Taylor (left) and Jennifer Snelson (right) check out the feedback from their latest assignment on an i-pod.

“the generic feedback helps to improve my confidence, especially knowing that others may be struggling with the same things”.

group presentation (17%), and an individual report (50%). PAF was provided to students for all three assessments. Information on the PAF was gathered through a bespoke pre- and post-podcasting questionnaire survey and a student focus group. The pre-podcasting questionnaire was designed to ascertain students' initial perceptions, experiences and attitudes to podcast feedback. The post-podcasting questionnaire reviewed the actual student learning experience compared with more traditional methods of feedback. As is common practice, these surveys were completed anonymously, although a coding system was used so that it was possible to identify how each individual student's opinions had changed. The responses to the surveys were comprehensive (pre-podcasting = 100% and post-podcasting = 69%). The comments provided in the two surveys were then used as the basis for further discussion in a focus group consisting of an independent external facilitator and a small number of self-selecting students, all of whom had completed the module. The focus group proved to be a particularly useful exercise that allowed clarification of some of the issues raised in the pre- and post-module surveys, as well as the identification of some more subtle points that were not evident in the responses to the structured questionnaires. The experiences of the focus group certainly confirm the value of using end of module discussions to gain a deeper insight into student perceptions of their learning experiences (Gold et al, 1991).

Results and discussion

The pre- and post-podcasting questionnaire data is presented thematically according to the two main themes - technology and personalised feedback.

Technology

Students were initially asked about their prior experiences of using podcast technology. Eighteen of the 26 Students (65%) who completed the pre podcasting questionnaire had never previously listened to, or watched a podcast, even though 22 students (85%) knew about podcasting. This inexperience in using the technology was clearly identifiable in the pre-podcasting questionnaire in which nine of the 26 students reported some reservations about using the technology, for example students expressed concerns about:

“The technicalities of [downloading podcasts]. I am a technophobe.”

“Not being able to use the [VLE]system.”

“[I have] never used [podcasts] before, I'm not sure how to do [download them].”

The post podcast questionnaire identified some of the technological glitches of working with this new technology, which have since been resolved, but are still important to report. The automatic e-mail to students confirming availability of podcast feedback was problematic, as some students did not receive the confirmation. The initial time lag in uploading the first PAF, due in part to local software problems, resulted in student frustration evident in the post-podcast feedback. The sound recording volume of the podcast was felt by 30% of the students to be low as it played somewhat quieter on student PCs. The initial concerns about using the technology were not fully realised with 17 of the 18 students who completed the post-podcasting questionnaire downloading more than two PAFs, and over 60% of the students confirming the ease with which the podcasts could be accessed. Only a minority of students reported problems in accessing and downloading the podcasts.

Personalised feedback.

The perception of the students was that PAF offered a more personalised form of feedback than traditional written feedback, with the additional generic feedback component offering a useful insight into the performance of the whole student cohort. A typical student response notes that *“the generic feedback helps to improve my confidence, especially knowing that others may be struggling with the same things”*. The initial concerns expressed at the start of the module focused around the perceived difficulty in listening to critical commentary of their work, rather than reading it. These concerns were not realised. Instead, the impact of the podcast feedback was perceived as being harder-hitting, in a form less easy to ignore; and the tone of voice of the feedback provided a clear context to the critical comments, that is unavailable in traditional written feedback. This is demonstrated by the following student comments:

“[The feedback was] really personal, you get the tone of voice with the words, so you could understand the importance of the different parts of the feedback”

“[The podcast format] makes you listen to all of the feedback not just the mark; because you are listening I seem to remember the comments easier than just reading them”

“[It was] more detailed and personal feedback. A clear idea of positive and negative points about my work”

The quality of PAF was deemed by virtually all students to be better than written feedback. There were no problems understanding lecturer's handwriting, the PAF appeared to be targeted to more specific points for improvement, and it provided a more accurate account of the quality of the assessed work. However, this may reflect not only the positive qualities of the PAF but the weaknesses in the current form of written assignment feedback.

Conclusion

Student feedback suggested that the use of PAF enhanced the student experience of this module. The benefits were most tangible in terms of improved assignment feedback that incorporated both generic and student-specific feedback. However, the focus group highlighted more subtle 'side-effects', including the importance of the tone of delivery of the podcast, and the less superficial nature with which podcast feedback is apparently treated.

The student experience during this module indicated that PAF is an interesting and worthwhile way of diversifying assessment feedback. Undeniably, the inclusion of this type of feedback was labour intensive (the creation of the podcasts and upload to the VLE) but it was rewarding for tutors.

More generally, the method of communicating feedback is important to the way in which students react to it and is related to their willingness to act upon it. Further research is needed into aligning the methods of feedback to the assessment, curriculum stage, and student cohort. Podcasting can now enter that mix of feedback mechanisms.

Acknowledgements

The authors would like to thank Dr Steve Fletcher of the University of Bournemouth for his insightful and constructive comments on earlier drafts of this paper and the students from

the University of Chester who participated in the evaluation of podcasting assignment feedback. The research on which this paper was based was a funded Small-Scale Learning and Teaching Project by the GEES Subject Centre and contributed to the University of Chester HEA/JISC e-learning Pathfinder project.

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Informal Mobile Podcasting and Learning Adaptation 2 (IMPALA 2)

The enthusiastic uptake of podcasting by a number of GEES practitioners has prompted the GEES Subject Centre to invite the IMPALA team at the University of Leicester to carry out a project specifically for the GEES disciplines.

IMPALA 2 builds on the outcomes of IMPALA (www.impala.ac.uk) and will test and develop five pedagogical approaches to using podcasts for student learning specifically for GEES subjects.

- Audio-visual fieldwork guides: explore geomorphological features, natural habitat, landscape
- Audio-visual laboratory work guides: instruments, techniques, software, data analysis
- Radio-style: bring topical issues on the environment, sustainability and development, and informal content (local community and subject experts' voices) into the formal curriculum
- Student-created: encourage student collaboration and active learning through 'digital story telling', and recording learning for reviewing and knowledge sharing
- Extensions to lectures: summaries, further reading and research.

Research questions to be explored during the project include:

1. How can podcasting help students and staff to tackle 'troublesome knowledge' and 'threshold concepts' in GEES subjects?
2. How can podcasts help students' learning in 'multiple learning spaces' in GEES subjects?
3. What are key issues and enablers for sharing, re-using and re-purposing podcasts and exemplars across GEES disciplines?

For further information please contact Mike Sanders by email on masanders@plymouth.ac.uk or phone 01752 233533.

Evaluation of low-cost Personal Digital Assistants (PDA) for field data collection and fieldwork leadership by students and staff

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Abstract

This project evaluated low-cost (< £200, 2006 UK prices) PDAs for use by students in field data recording, and two advanced model PDAs for use by staff in fieldwork leadership. The low-cost PDAs will also, undoubtedly, come down in price over the next year or two, offering the possibility of providing all students with such a device to assist in field data collection and other aspects of their University studies. Improvements in memory capacity will also offer greater functionality for storing notes, handouts, lecture presentations, video and audio files. However, the low-cost PDA models are not waterproof, which is a major drawback for field use. Field use of PDAs offered clear benefits to teaching and learning, particularly as students were able to record their data onto PDAs in Excel, and copy files to a central PDA (managed by a staff member) via Bluetooth. The staff member could then download files to a lap top or desktop docking station and email them to the rest of the students. Data files can also be transferred to students' mobile phones, iPods etc if they have Bluetooth. Use of a lap top in the field ensured that students could obtain copies of data files using data pens (which most of the students had) or directly via SD cards (available in many digital cameras owned by students). This makes the sharing and backup of data in the field readily possible and overcomes the problem of hand written field notes getting wet, muddy or lost. It enhances students' ability to organise and share their group data, share field notes and observations, and to improve their subsequent preparation of assessed field reports.

Background

Recent advances in mobile technologies, in particular in hand held computers and personal digital assistants (PDAs), have the potential to be used by students for data collection in fieldwork, and by staff for leadership and organisation tasks. To date, few studies are available from which we can evaluate the use of PDAs by students during fieldwork. Bishop Burton College (JISC Innovative Practice with e-Learning, 2003) for example, has used memory expansion cards with Hewlett Packard (HP) PDAs to store a database of plants containing 1,400 images. Such devices have the potential to make field maps, diagrams, images (eg. photos which expand timescales) and short video clips available to learners in field situations, to enhance learning, undertake assessment and to give feedback. The incorporation of global positioning systems (GPS) into newer models (eg. Trimble) is also being trialled in fieldwork by some universities (eg. Nottingham University). However, PDAs capable of these GPS/GIS functions are an order of magnitude more expensive than the low-cost ones evaluated in this study.

During field investigations, students typically worked in groups of 3-4 to collect data for the problem set.

The project's aims were:

1. To evaluate low-cost (< £200, 2006 UK prices) PDAs for use by students in field data recording situations,
2. To evaluate two advanced model PDAs for use by staff in fieldwork leadership.

Following a market survey of PDAs the following were purchased for evaluation in this study (Fig. 1):

- 4 x Hewlett Packard HP hx2190 Pocket PCs with leather case and waterproof Ortlieb map case (Fig. 1A)
- 1 x Hewlett Packard HP hx4700 Pocket PC with external GPS and leather case (Fig. 1B)
- 1 x Hewlett Packard HP hw6516 Mobile Messenger Pocket PC with Quad band GSM, internal GPS and GPRS receiver (mobile phone) and integrated camera (Fig. 1C)



Fig. 1A: Hewlett Packard HP iPAQ hx2190 Pocket PCs



Fig. 1B: Hewlett Packard HP hx4700 Pocket PC



Fig. 1C: Hewlett Packard HP hw6516 Pocket PC

All three models of Pocket PC operate with the same software—Windows Mobile™ 2003 second edition, which comes pre-installed. The programs include: ActiveSync (to synchronise the pocket PC with a desktop or lap top; pocket versions of Word, Excel, calendar, contacts database, Internet Explorer; Clear Vue PDF, and Presentation; HP Image zone; Windows Media Player; and, for the hw6516 only, HP Photosmart and SIM Manager. Interactivity between the models (via Bluetooth), and learning to use the software was facilitated by the fact that all three models operate with the same software.



Fig. 2: Using HP hx2190 PDA to record field data during river survey in Langdale, Cumbria



Fig. 3: Using HP hx2190 PDA to record field data during river survey in Langdon Brook, Forest of Bowland, Lancashire.



Fig. 4: Using HP hx2190 PDA to record field data during cave survey in Great Douk Pot, Ingleborough, North Yorkshire.

Methods

Opinions on the usefulness of the PDAs were gathered from both students and staff.

A. Student evaluation

The PDAs were used during fieldwork on four modules during March / April 2006:

1. BIEES2026: Glacial & Fluvial Processes – river survey in Langdale, Cumbria on 16 March 2006. (Fig. 2).
2. OLFE01202: Geographical Basis of Outdoor Education - Micro-climatology practical/fieldwork on Mon 20th and Fri 24th Mar-06 (Ainsdale dunes, Formby)
3. OLFE02003: Earth Surface Processes – rivers fieldwork in Trough of Bowland on Wed 22nd Mar-06 (Fig. 3)
4. OLFE02202: Caving & Karst Landscapes 3 -7 April: North Yorkshire - cave survey and cave science (Fig. 4).

During field investigations, students typically worked in groups of 3-4 to collect data for the problem set. One PDA was allocated to each group of three to four students, so usually one student volunteered to take charge of the PDA and had the responsibility for recording the data. In this study, the PDAs were primarily used for recording field data in Pocket Excel, where recording templates had been designed and pre-installed on the PDAs. Students using the PDAs were given a short oral briefing on how

to turn on the PDA and how to access the prepared Excel recording template. Little further instruction was needed, though the staff member remained available throughout the field survey in case help was required. All students were familiar with the use of Excel on a desktop PC. The use of the PDAs by students was evaluated immediately after its use in the field by means of a simple questionnaire (Fig. 5).

B. Staff evaluation

The staff evaluation was based on using the HP hw6516 daily for nine months, primarily as a: diary and contacts list (using Outlook calendar); camera; Excel for fortnightly field data recording; Word for field notes; phone and text messaging; task list; note pad; and calculator. Microsoft Pocket Streets 2006 (build 13.0.09.0100) was installed (free download from HP web site) along with maps of Liverpool. AA navigator software was purchased and installed on the HP hx4700, which was evaluated as an in-car Satellite Navigation System.

Results

A. Student evaluation

In total, 21 students used the PDAs for field data recording in Langdale (river survey, n = 8); Trough of Bowland (river survey, n = 4); in the Yorkshire Dales (cave hydrology and cave survey, n = 5) and in the Ainsdale sand dunes at Formby (micro-climatology survey, n = 4). Students were studying at Level 1 (n = 4) and Level 2 (n = 17). The students were drawn from four programmes of study: BSc (Hons) Outdoor & Environmental Education; BA (Hons) Adventure Tourism; BSc (Hons) Geology; BSc (Hons) Physical Geography. Thirteen of the students were male and eight were female. Five of the students had used a PDA before, while 16 had never used one.

All responses on the -5 to +5 scale, were positive (Fig. 6), with a majority of students feeling that the PDA was effective for recording field data. Specific questions about their experience of using the PDA were asked in section 3.2 and the results are shown in Fig. 7. For all questions, all students who responded (n = 17) either agreed or strongly agreed with the question, except for one student who preferred to record the data in a notebook. Table 1 gives a summary of students' written comments collected via the questionnaire.

Fig. 5: Questionnaire completed by 21 students following fieldwork with the PDA.

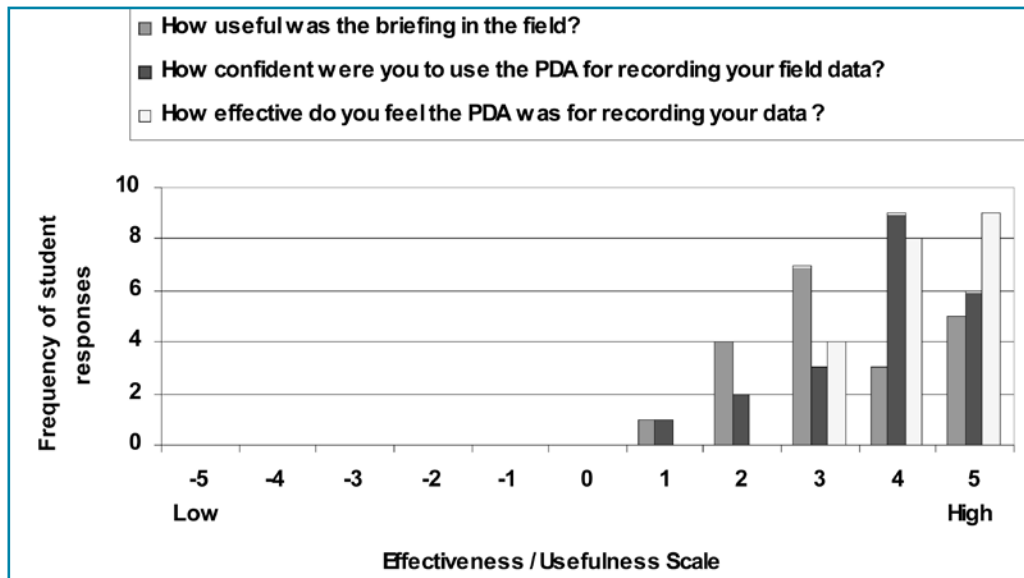


Fig. 6: Students' opinions of confidence and PDA effectiveness.

Table 1: Students' Written Comments from Questionnaire

Student Positive Comments (each comment separated by ';'):

Fairly quick to use; the data are straight onto a spreadsheet ready for analysing; quicker and less chance of collecting incorrect data; less paper to be carried, therefore less lost; when back home the data don't have to be put into excel because it's already been done in the field; no wet pieces of paper; will be easy to transfer to PC, legible results; don't need to write much; saved lots of paper flapping about in the wind; the data were recorded in an easy access format; the PDA doing my calculations and not having to write when hands very cold; quick and easy data input and calculation; allowed better layout of data than in notebook; small, easy to use, works in all weather.

Student Negative Comments (each comment separated by ';'):

The weather was bad so it was a little fiddly to use in the waterproof case; low battery and working in the rain/snow made it hard to view screen; battery life?; can't see the screen very well in sunlight; it not being waterproof; only when it snowed, protecting PDA in waterproof bag - hard to see screen and awkward to hold PDA in bag; difficult to read in sunlight and under waterproof cover when raining.

Student Suggestions:

1. Study with a PDA before using in the field, to get used to it, and draw up own prepared worksheet
2. Use them on all fieldtrips; quick and easy to use
3. Let there be more PDAs available for everyone
4. Provide bigger plastic bag for use in wet weather
5. Waterproof case instead of big bag
6. Waterproof case that fits the PDA

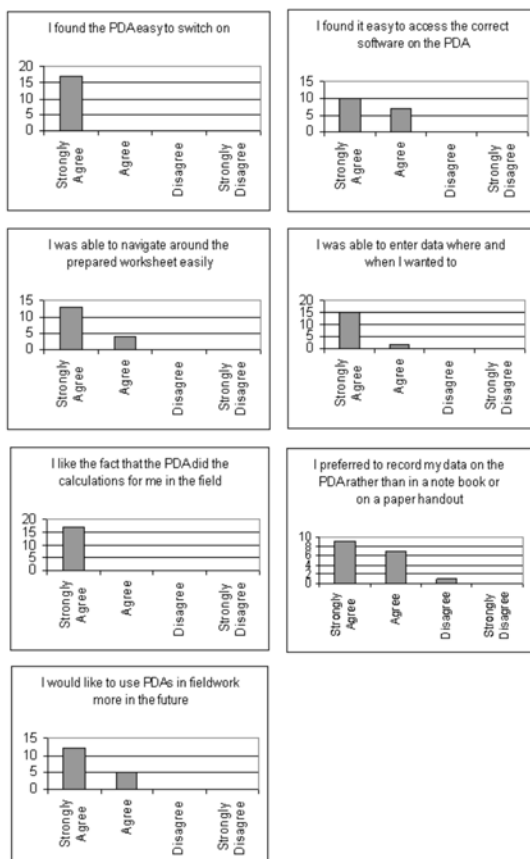


Fig. 7: Students' opinions of using PDAs for field data recording.

B. Staff evaluation

The staff evaluation results are summarised in Table 2.

Conclusions

1. Field use of PDAs offers clear benefits to teaching and learning, as using the current technology ensures the sharing of data is readily possible. The difficulty in sharing data has been a major problem with field notes in the past, but use of PDAs overcomes this issue, enhancing students' ability to organise and share their group data, share field notes and observations and to improve their subsequent preparation of assessed field reports.
2. The likely further reduction in price of the low-cost PDA models (~£200, 2006 prices) offers the possibility of providing all students with such a device to assist in their University studies. Improvements in memory capacity will offer greater functionality for storing notes, handouts, lecture presentations, video and audio files.
3. Although the low-cost PDA models are not waterproof, a major drawback for field use, the waterproof map cases provided worked. However, these did make using the PDA in bad weather more difficult. Another problem encountered was the ability to see the screen in bright sunlight, but covers that shaded the screen were deployed to help with this. The illuminated backlit screen was useful in low light conditions (eg during cave survey).

Table 2: Staff Evaluation of models HP hw6516 and HP hx4700.

Model	Programs used in Windows Mobile™ 2003 2 nd edition or function	Evaluation comments
HP hw6516 [screen 5.5 x 5.5 cm]	MS Active Sync	Synchronised all files, diary, contacts with desktop or lap top computer via a cradle which also charges the PDA
	Outlook Calendar	Synchronisation with Outlook on desktop the most valuable point, so diary and contacts are backed up. Takes some time to get used to. Slower to enter appointments than paper diary; can sync with email to send email appointments
	Contacts	Synchronises with contacts in Outlook on desktop so email contacts and emergency phone numbers are available in the field and backed up
	Task list	Useful for pre-field trip planning as reminders of tasks which need to be undertaken prior to and during field excursions
	Excel	Used fortnightly to record erosion pin survey data very successfully. Good in low light conditions as backlight illuminates screen.
	Word	Used for field notes; records of passwords, room codes etc. Can load copies of field handouts but screen really too small and lots of scrolling needed
	ClearVue PDF	Useful for reading PDF files, journal articles but screen really too small and lots of scrolling needed
	HP Photosmart	Integrated camera useful for field photos but quality too low for most uses
	HP Image zone	OK for viewing photos taken using HP photosmart or photos imported via SD card or Bluetooth
	Windows Media Player	Plays audio or video files in compressed format
	MS Pocket Streets	Free maps downloadable for major UK cities only so limited in that respect. However, zoom function allows location of addresses. Touch roads to find streetname/house numbers
	Mobile phone	Essential piece of field leader's equipment for emergency use; problem solving and keeping in contact with other members of the party. Hampered by lack of reception in many mountain areas.
	SMS text messaging	Useful for keeping in contact with other members of the party. Hampered by lack of reception in many mountain areas.
	SD card	Extra field storage available with standard and small SD card slots
HP hx4700 [screen 6 x 8.5 cm]	AA Navigator to make in-car satellite navigation system	AA Navigator (£80, 2006 prices) installed from an SD card which stores the street map coverage (UK only). Blue tooth connections with external GPS unit (requires separate charger). Both PDA and GPS unit can be charged via car 12v socket. Frequent problems getting PDA and GPS unit to talk (Bluetooth) but works OK once set up. Verbal instructions or map mode. Enter postcode or find major attractions like rail stations, hotels. Useful for navigating to field sites (??) or possibly for emergencies (nearest hospital, public transport etc). Reliability a little suspect and dependent on keeping batteries charged. Larger screen useful. Screen resolution better than hw6516.

Future possibilities

1. Groups of students could have theory slides (PowerPoint) available with them in the field (in colour) to back up practical work.
2. Students could have copies of colour photos taken during previous field visits, or during different conditions (eg rivers in flood, poor or good weather conditions) to expand their timeframe and give a different perspective (eg before/after a landuse change). (Use of historical photos is also possible.)
3. It is possible to load video clips onto PDAs, which could enhance the possibilities above even further.
4. It may be possible to record audio instructions to the PDAs, which students can play in the field. This could provide an alternative to reading handouts, though students would need their own PDA.

Acknowledgements

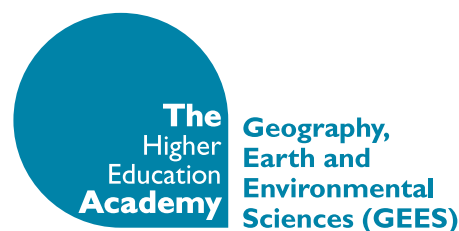
This work was supported by an £1148 award from the Centre for Excellence in Leadership and Professional Learning at Liverpool John Moores University, which was used to purchase 4 low cost HP hx2190 PDA s and cases used in the student evaluation; and a £1000 award from the LTA Budget from the Faculty of Education, Community & Leisure at Liverpool John Moores University, which purchased one HP iPAQ hx4700 and one HP iPAQ hw6516 used in the staff evaluation.

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Supporting fieldwork using information technology

John Maskall, Alison Stokes, Jason B. Truscott, Alastair Bridge, Kirsty Magnier and Viv Calderbank

Centre for Excellence in Teaching and Learning (CETL) in Experiential Learning in Natural and Environmental Sciences, University of Plymouth

Summary

This article summarises the key outcomes from the conference on “Supporting Fieldwork Using Information Technology” held at the University of Plymouth in May 2006, which featured a wide range of presentations and demonstrations outlining the various technologies which are currently applied to fieldwork in the GEES subject areas.

Introduction

The “Supporting Fieldwork Using Information Technology” conference was co-hosted by the Centre for Excellence in Teaching and Learning (CETL) in Experiential Learning in Natural and Environmental Sciences and the GEES Subject Centre, with the key aim of exploring the ways in which innovative technologies could be harnessed by practitioners in Higher Education (HE) in order to:

- Enhance students’ preparedness for fieldwork
- Gain remote access to crucial information whilst in the field
- Record field phenomena in more sophisticated ways
- Challenge students in post-fieldwork assessment

It is anticipated that a better knowledge of the pedagogical value of IT in fieldwork will benefit the work of the CETL, and will also be of value to the wider HE community by increasing awareness and understanding of how and why certain technologies facilitate the learning process.

As a follow-up exercise to the conference, delegates were asked to complete an online survey designed to capture information relating to their current experiences of using Information Technology (IT) in fieldwork, together with their thoughts and ideas for future development. The first section of the following overview summarises the key points arising from the oral presentations, whilst in the subsequent section the key findings of the survey are integrated with the main themes emerging from the presentations. These then form the basis for discussion about the current trends, drivers and barriers to this emerging area of pedagogy.

Conference Presentations

The “Supporting Fieldwork Using Information Technology” conference featured nine oral presentations, together with a number of posters and demonstrations. The abstracts, together with some PowerPoint slides, can be viewed on the GEES Subject Centre website at <http://www.gees.ac.uk/projtheme/cetls/el/fwitconf06.htm>

Keynote: ‘E-Learning in the GEES disciplines: Results and examples from a practitioner survey in the UK’ – Derek France, University of Chester (d.france@chester.ac.uk) and **Steve Fletcher, Southampton Solent University** (steve.fletcher@solent.ac.uk)

This talk provided an overview of the current role of IT within field-based learning environments, together with the main

challenges and benefits faced by users. Real-time feedback from the audience gathered using “Communi-cubes” was broadly consistent with the results from previous surveys into the use of IT in fieldwork (e.g. the ‘Fieldwork, Education and Technology’ study of Fletcher *et al.* (2003) and subsequent surveys on e-learning and Virtual Learning Environments (VLEs)). Discussion was supported by two very interesting case studies where IT has been used by the authors:

- A ‘Virtual Field Course’ (VFC) to the Cromarty Firth (Fletcher, 2003)
- The assessment of fieldwork using student websites (France & Ribchester, 2004)

‘Towards a generic on-line fieldwork and laboratory environment’ – Phil Marston, University of Aberdeen (p.marston@abdn.ac.uk)

A project is currently underway to develop virtual learning environments specifically aimed at delivering realistic simulations of field visits and laboratory exercises for campus based students (for further information see <http://www.abdn.ac.uk/diss/ltu/pmarston/>). The ‘Virtual Environments Shell’ can be used to present a variety of spatially related materials and data, whilst the Virtual Zoology Laboratory generates personalised datasets and incorporates a built-in capability for ‘human error’.

‘From pencils and paper to laptops and lasers, the role of IT in earth science teaching’ – Phill Clegg, University of Durham (p.clegg@durham.ac.uk)

A proliferation of new technologies has enabled mapping of the natural world to become increasingly effective, and the application of these technologies is enabling students to better understand geological maps and visualise landscapes in 3D, e.g. via improved field observations and analysis. The advantages and disadvantages of digital geological mapping tools such as Geographic Information Systems (GIS), Digital Elevation Models and Light Detection and Ranging were outlined, together with the main barriers to uptake (e.g. cost, reliability and training) although these are generally considered to be resolvable.

Keynote: ‘Mobile technology in fieldwork and flexible learning: gadgets, pilots and horizons’ – Kenny Lynch, University of Gloucestershire (klynch@glos.ac.uk)

This presentation provided an overview of current use of mobile technologies in fieldwork (‘gadgets’) and the opportunities these present for increased flexibility in learning. Two examples (‘pilots’) of the use of mobile technologies based on the authors’ own teaching experience were given, together with the barriers that were encountered. Finally, the ways in which this area of technological development could be utilised to enhance learning in the future (‘horizons’) were explored.

‘Taking GIS-based 3D Visualisation into the Field’ – Gary Priestnall, University of Nottingham (gary.priestnall@nottingham.ac.uk)

This talk focused on the role of mapping and digital rendering technologies to enable 3D landscape visualisation whilst in the field and the lab. The use of Personal Digital Assistants (PDAs) and tablet computers in the field allows students to visualise specific features such as underlying geology, which can then be compared with the actual landscape. These mobile technologies are now being complemented with ‘augmented and virtual reality’ systems which ‘immerse’ the user in a computer generated landscape to support spatial thinking.

‘The Tamar GIS Project: bringing datasets together so that value-added activities can be undertaken’ – Samantha Lavender, University of Plymouth (s.lavender@plymouth.ac.uk)

A project is currently underway to develop a GIS database of the River Tamar catchment, which will bring together a range of information including base maps (Ordnance Survey & aerial photos), agriculture, ecology, forestry, history, hydrology, and industry (for further information see <http://www.research.plymouth.ac.uk/geomatics/>). This database could potentially be used as a resource to support interdisciplinary field activities across a range of subject areas.

‘Assessment – everything comes down to assessment...’ – Brian Whalley, Queen’s University Belfast (b.whalley@queens-belfast.ac.uk)

A range of technological ‘ideas’ designed to aid student data gathering, assessment and feedback were discussed, including:

- *Virtual* - structuring a tutorial-type process through tasks and information which can be fieldwork related;
- *Podcasts for landscape analysis* - create your own reusable educational objects and provide feedback;
- *Geocaching* - student guided rambling around a field site to gather data for lab use and assessment;
- *Webfolios* – a means for student to display and reflect upon their practical work which can be assessed easily and linked with Personal Development Planning (PDP).

‘E-learning for fieldwork: learning design, standards and interoperability’ – Eduardo Serafin, University of Edinburgh (e.serafin@ed.ac.uk)

An innovative, web-based learning system is being developed to support a physical geography field course in Iceland, using Extensible Mark-up Language (XML) topic maps and Information Management System (IMS) learning design to design a ‘schema-based’ content (for further information see <http://www.geos.ed.ac.uk/undergraduate/elf/>). Using this approach, website content can be separated from the style and delivery technology, leading to an improvement in searching and managing data. Further, it is anticipated that the software could be readily modified to accommodate the annual improvements and changes inherent to any field course.

Roughly equal numbers reported using IT before, during, and after fieldwork

‘Are virtual fieldtrips a substitute for the real thing?’ – John Spicer, University of Plymouth (j.i.spicer@plymouth.ac.uk)

Results from a study into the use of a hypermedia package on Tide Pool Ecology revealed there were no academic differences between students who were being taught in traditional lectures compared to students who were being taught with Virtual Field Trips (VFTs) (Spicer and Stratford, 2001). From the study it was concluded that, while increased use of VFTs in particular was perceived as a positive and exciting prospect by biology undergraduates, they were also quite clear that this should not be at the expense of real fieldwork.

Results of online survey

The post-conference survey generated a response rate of 21% (n=22) from conference delegates. In addition to the GEES disciplines responses were received from academic staff in ocean science and civil engineering, and also from technicians, learning technologists and library staff. Following is a brief summary of the key points relating to questions addressing current and future use of IT:

If you currently use IT in fieldwork, at which point do you use it?

Roughly equal numbers reported using IT before, during, and after fieldwork (Figure 1).

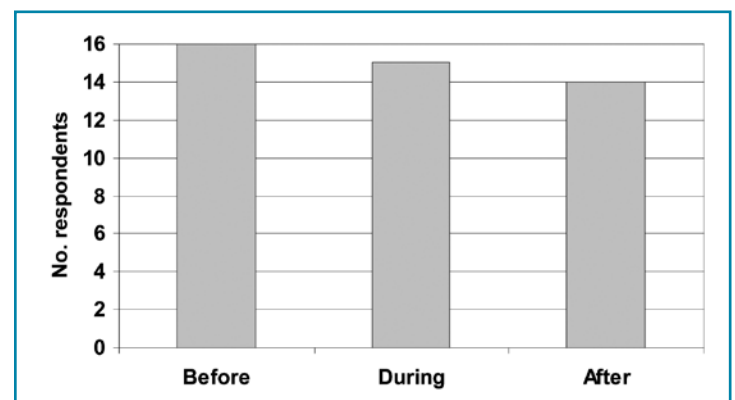


Figure 1: Timing of IT use in relation to fieldwork

What are your main reasons for using IT in fieldwork?

The enhancement of student skills, increased efficiency, and increased student confidence were all cited by at least half of the respondents as being their main reason for using IT in fieldwork (Figure 2). Student employability and overcoming troublesome knowledge are also popular reasons for using IT, although over a third indicated that staff interest had an influence.

If you are currently using IT during fieldwork, what types do you use? What other types of IT would you be interested in using during fieldwork?

Whilst the most popular technologies currently used in fieldwork are digital cameras and Global Positioning Systems (GPS), respondents indicated a significant interest in using PDAs and tablet/notebook PCs, with a degree of interest in using video cameras (Figure 3).

If you have previously used IT in fieldwork what types of problem have you encountered? How have these been overcome?

The two main problems encountered with using IT in fieldwork relate to:

1. hardware issues, particularly field reliability and portability;
2. ensuring that students and staff are familiar enough with the technology.

To solve these problems, staff relied on a variety of strategies:

- purchasing 'ruggedised' equipment or protective housings;
- carrying spare batteries and chargers;
- using more basic technology;
- developing user friendly software;
- training for staff and pre-fieldwork sessions for students.

What are your future plans, if any, concerning the use of IT in fieldwork? How do you think this will benefit your students?

A significant proportion of responses to this question focused on the application of IT in field teaching, e.g.:

"I plan to use more video footage of people presenting as a tool for improving teaching in fieldwork by reflecting on delivery and structure"

"To use IT as a mainstream teaching and learning medium within Earth Science"

"[to explore] the use of [a tablet PC, data loggers and GPS] within teaching over the next 12-18 months"

The main benefits to students would be the development of transferable skills (including those associated with IT use), and the ability to analyse and interpret data. Methods of, and skills in, 3-D visualisation were also mentioned both in terms of future plans and student benefits.

Conclusions

As these findings have built on previous research undertaken by Fletcher *et al* (2002), it is appropriate that we should pose some of the same questions addressed by the expert group of the Fieldwork, Education and Technology (FEeT) study.

What are the central trends in the use of IT in fieldwork?

A key trend identified by the FEeT study was widespread use of the web, especially as a platform for pre-fieldwork preparation materials. Whilst this is still prevalent, emphasis is now also being placed on careful design of such software to maximise ease of updating, modification and repurposing.

Other trends identified in 2002 included the use of a wider range of multimedia and virtual environments together with visualisation tools. Integration of data in the field was found to be occurring at a great extent and the use of mobile phones and GPS were noted as important in the development in field

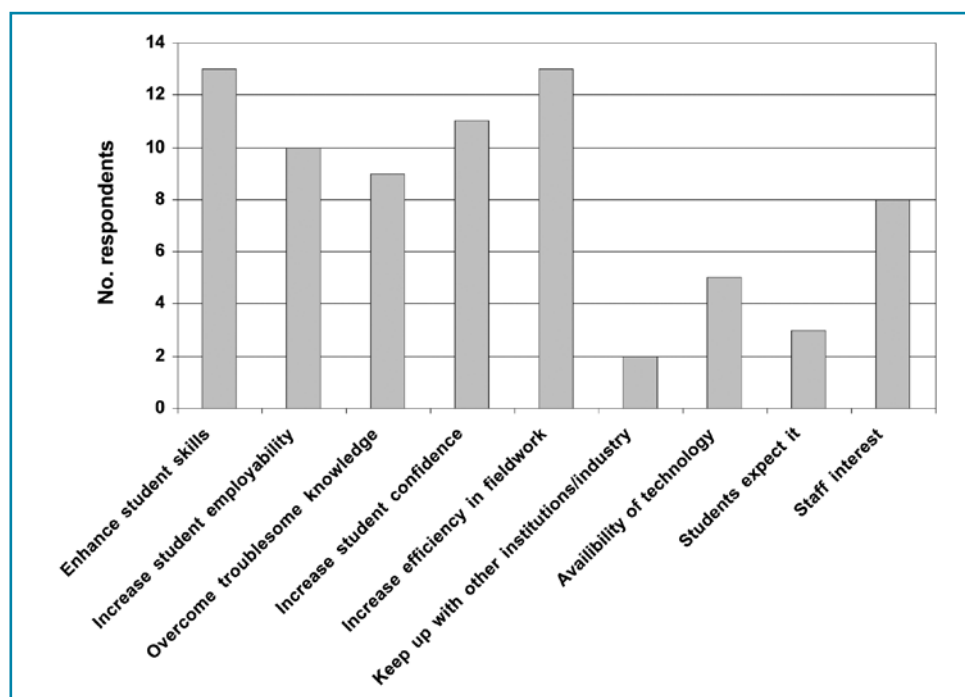


Figure 2: Main reasons for using IT in fieldwork

mapping projects (Fletcher *et al* 2002). Whilst these developments are still continuing, it is clear that since this time, the potential and demand for integration of data in the field has progressed significantly. This is due to the greater availability and affordability of mobile devices such as PDAs and tablet PCs and their role in acquiring and visualising GIS and other forms of data. Use of portable audio (MP3) and video technologies has also increased for recording and presenting field information and data.

What central factors are driving the integration of C&IT in fieldwork?

Several factors identified by the FEET study are still relevant, particularly the widespread availability of technology and its falling costs. However, their observation that (in 2002) 'no institutions represented at the meeting or in the survey were yet using palmtop computers' is a telling one. We have since witnessed a significant advance in the capabilities of mobile devices especially in relation to their portability, memory capacity, robustness and flexibility. These attributes, combined with the proliferation of wireless networks and the increasing availability of online digital resources allow new approaches to learning in the field environment. Another new theme to emerge at this conference was the increased technological awareness and indeed expectations of the current generation of students, although this did not feature in the survey as a dominant driver.

The inherent tension between pedagogic and technological drivers within fieldwork and IT has not gone away and featured as a subtext in most presentations. Nevertheless, the dominant opinion is still that outlined by Fletcher *et al.* (2002) that "Care has to be taken that the driving force is not totally technology led, but the use of IT has definite pedagogic benefits". Survey results indicate that the dominant reasons for using IT in fieldwork are

associated with pedagogy and increasing efficiency rather than the availability of technology.

What central factors are hindering the integration of C&IT in fieldwork?

Increasing use of mobile devices in the field environment has led to more staff experiencing their shortcomings. Technology issues most commonly encountered relate to ruggedness, reliability and usability, whilst cost of hardware and digital data was also mentioned. Another major issue is the requirement for staff and students to familiarise themselves with the technology through training or preparation sessions. This is essential so that the development of IT skills (which can be an important outcome) does not become the dominant learning activity whilst students are actually in the field. There is also a risk that certain uses of IT in the field could become 'discipline specific' when in reality, and as this conference has demonstrated, there is great potential for their application in other subject areas.

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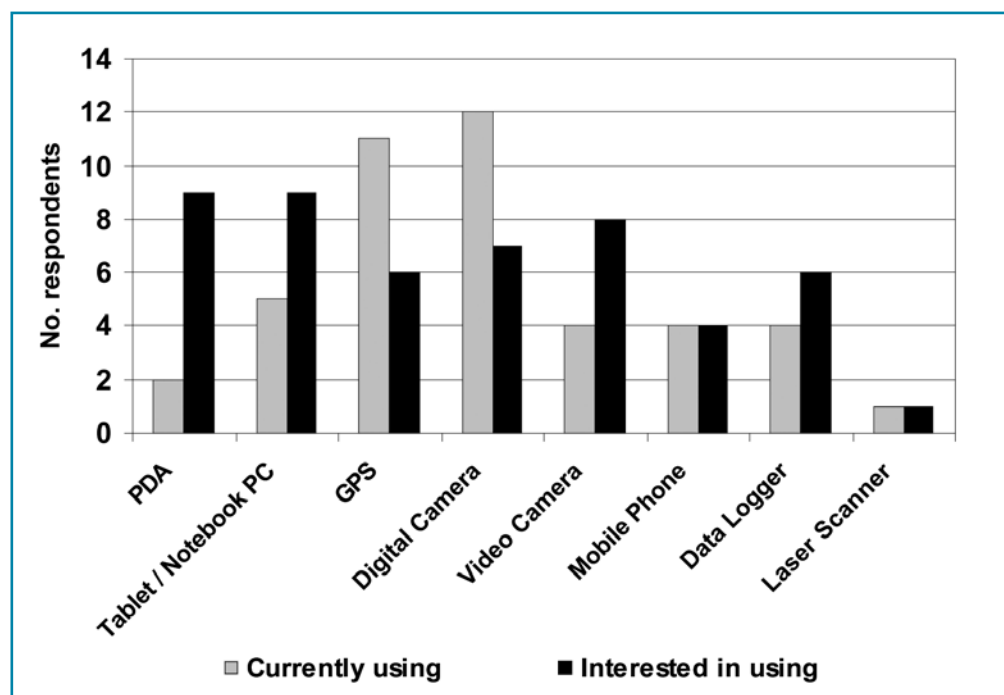


Figure 3: Use of IT tools during fieldwork

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A virtual world of work: A tool to prepare students for employability

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Introduction

Over the past decade orientation towards the workplace has become more explicit in undergraduate curricula. Work-related and work-based learning are now common elements of degree programmes in GEES, and other, disciplines. Work-related learning has been embedded within the geoscience curriculum in the School of Biological and Earth Sciences at Liverpool John Moores University for many years. Key skills modules have facilitated the development of those transferable skills valued by employers. Subject specific modules enhance awareness of the 'real world' by inclusion of problem-based learning and lecture presentations from external professionals. Opportunities for placement learning are provided by an accredited Level 3 work-based learning module (based on a short work placement) or the traditional 12 month professional training (sandwich) year leading to the award of a Certificate of Professional Training.

Recent cohorts of students have shown considerable interest in, and recognition of, the merits of placement learning. The availability of two models of work-based learning within the School is attractive to the students, giving as it does, the choice between a short (one month) placement or the traditional sandwich year. Ironically, despite their informal experiences of the world of work (through part-time and vacation employment), some students find the process of applying for placements, preparation of CVs, interviews and identification of placement learning both challenging and intimidating. The need to plan, be proactive in searching for placements, and to attend interviews has proved to be a discriminator of those students who are committed, tenacious and willing to address challenges and those who are not. It has been viewed, however, that some who opted out of the process were doing so solely due to lack of confidence. Additionally, Liverpool John Moores University has recently initiated an institution-wide programme of work-related learning (LJMU+) that aims to bring students and staff closer to the world of work. These developments resulted in the identification of a need for a resource that students could use independently that would (a) remove some of the fear of the professional workplace; and (b) enable students to be better prepared for the world of work.

The School already had experience of the development of virtual field work (Stott *et al.*, 2006). Discussion with the multimedia staff in the department showed that the same web-based approach could be employed to develop a virtual world of work as a tool for supporting students' preparation for the workplace. The technology and key expertise were in situ, so funds were sought from the GEES small-scale project scheme to develop a prototype virtual world of work.

... the same web-based approach could be employed to develop a virtual world of work as a tool for supporting students' preparation for the workplace

Virtual learning environments

E-learning describes the use of technology to support and enhance learning practice (Mayes & de Freitas, 2004). The design imperative for a virtual world of work was to produce a learning tool that students would wish to engage with and so enhance their preparation for the workplace. It was envisaged that most students would access the web-based resource individually, but the varied format of learning tools incorporated in the site would be conducive to them working as small learning communities in learner resource centres or in their homes. Much time and effort was given to ensuring that all elements of the resource were accessible to students with disabilities.

The virtual world of work embraces many principles of the USEM model of Knight and Yorke (2002) ie. the interrelationship between subject understanding, skills (including key skills), personal qualities including self-theories and efficacy beliefs, and metacognition. Metacognition is central to the focus of the virtual workplace ie. the exercises encourage the students to develop self awareness of their learning and to enhance their capacity to reflect on, in and for action with that 'action' being the transition to the workplace.

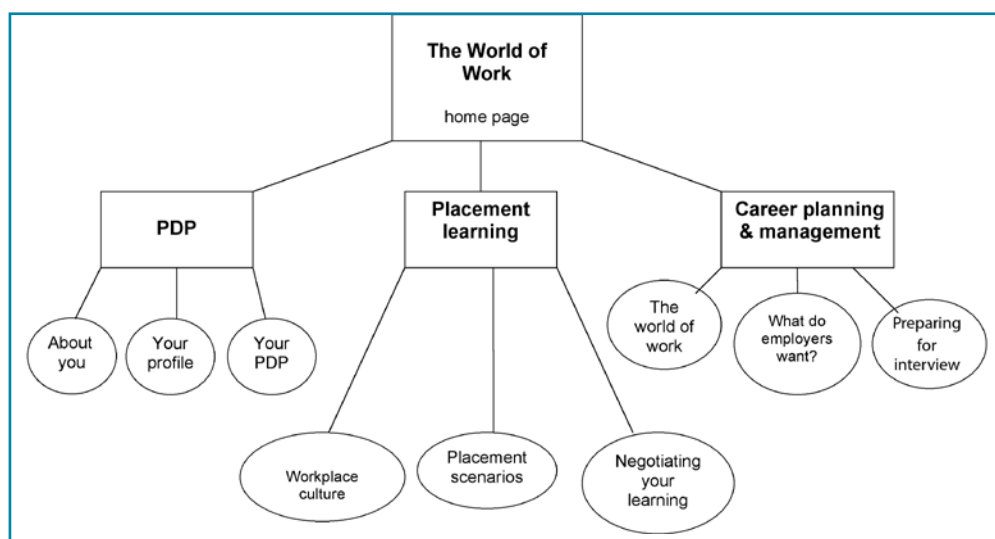


Figure 1: Key structural elements of the virtual world of work

Structure and content

A requirement for the virtual world of work was for a 'one size fits all' approach that would engage students at different academic levels, and which they could access independently at different stages in their degree programme. Students are able to access the LJMU intranet remotely from the university, so use of a web-based approach would facilitate access, regardless of the students' locations. Diverse learning tools were incorporated to accommodate the varied range of learners that are characteristic of universities today.

The structure of the virtual workplace is presented in Figure 1. A screenshot of the home page is shown in Figure 2. The student is directed through the undergraduate skills process from personal development planning (PDP), through preparation for placement learning to career planning and management. As such, it embeds learning at different levels with PDP aimed particularly at Level 1 students, preparation for the workplace at Level 2 students and career planning and management at Level 3. However, this hierarchy is implicit, rather than explicit, and it is envisaged that students can access material at any level on a need-to-know basis.

Yorke and Knight (2004) acknowledge the considerable potential of PDP to assist students in the development of their employability. Edwards (2005) reviewed ways in which PDP may be connected to employer needs and the world of work. He endorsed an approach whereby PDP activities fostered reflection and action planning in relation to competencies, and the

presentation of evidence of competencies achieved. This strand of the virtual workplace uses mainly descriptive and interactive text elements to encourage the student to reflect on the skills they feel that they 'own'. They are required to reflect on their transferable skills, to prepare their curriculum vitae and, ultimately, to produce a personal development plan.

The section addressing workplace learning is aimed particularly at supporting those students who are considering doing the work-based learning module or the professional training year in the placement. Case studies, video clips and descriptive material invite the students to have a more realistic awareness of the workplace culture and ethos. The section on placement scenarios makes use of 360° digital panoramas of field locations to enable the student to identify opportunities for learning that may arise during the course of a placement (see below). The route through 'negotiating learning' aims to reduce the anxiety that some students experience when faced with the task of drawing up a learning agreement. It is a strange paradox of higher education that, all too frequently, we fail to help students to understand how they learn. In the new virtual material, therefore, students are presented with examples of 'good' and 'bad' learning agreements and are required to reflect on these and identify the respective strengths and weaknesses.

The third key strand – career management – focuses on students' readiness for transition to the professional world of work. Sub-strand 'The World of Work' invites the students to learn about employer expectations of graduates, and requires the

student to reflect on those areas that they feel may necessitate further development if they are to compete in the workplace. 'What do employers want?' provides exercises based on person and job descriptions, and aims to facilitate understanding of the need to focus applications clearly. The third sub-strand of this route uses video clips of mini dramas to promote awareness of good and bad practice in interview technique. The short clips were prepared by filming employers interviewing 'students' (LJMU drama graduates) using the style that they would normally use in a real interview. Students are required to reflect on the strengths and weaknesses of the scenarios and to identify any areas of their own performance that may need to be addressed if they are to be successful in interview.

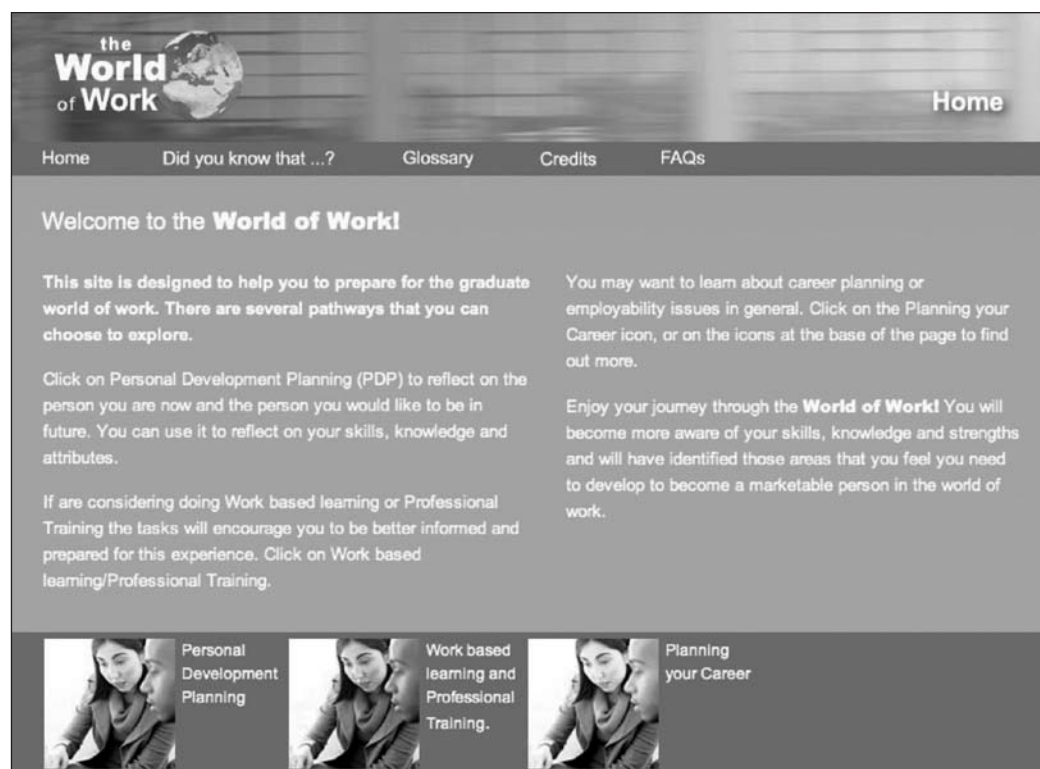


Figure 2: Screenshot of virtual world of work home page

Additional elements

'Talking heads' video clips are employed to provide the student with an overview of key concerns of the journey from university to work. Each home page for the three main themes incorporates links to four different talking heads. This tool is based on the view that students may engage better with video 'snaps' of people other than the staff they are familiar with. Contributors to the 'talking heads' vignettes include former GEES graduates of LJMU, current undergraduates, teaching staff, staff from the LJMU Careers service, and employers. The 'talking heads' are as follows:

- PDP: Two students report their feelings about the PDP process, while two LJMU academics explain why they believe PDP is important
- Placement learning: Two students who had undertaken placement learning report their first-hand experience of the work place as a learning environment; two employers report their experience of supporting GEES learners in the workplace.
- Career Planning: A Careers advisor explains the importance of planning ahead. Two former graduates report their experiences of the transition from the world of learning to the world of earning. Finally, a geoscience employer explains what skills and qualities he would look for in a graduate employee.

Thus, by the use of this unusual, yet engaging approach, students gain some insight into different dimensions of the graduate world of work. The material is presented in 'digestible' bites to diminish a sense of boredom pervading the exercises.

An alternative learning approach uses 'hot spots' features on 360 degree digital photographs. This technique had previously been used in the virtual fieldwork, so it was easily translated for this purpose. In the virtual world of work, students click on key features of a landscape view and are invited to translate what they see into potential tasks for a hypothetical learning agreement. This underpins the need for students to produce learning agreements for their work placements, and is a task that, traditionally, they find particularly challenging.

Future developments

The attraction of the virtual world of work is that it embeds many aspects of the university-workplace transition in one easily navigable resource. Students may choose to access it at any time independently, or it can complement a tutorial programme or other learning modes. There is considerable potential to embed

the Virtual World of Work within the geoscience curriculum. It is envisaged that formal lectures from Level 1 and Level 2 'skills' modules will be replaced by self-guided study based on the virtual workplace and supported by tutorials. Internal LJMU funds have been applied for, to facilitate development of a 'bioscience' strand to the Virtual WoW, to enable all students in the school access to the same learning resource.

Further evaluation is to be carried out over the next 12 months, both internally and externally, with students and colleagues. The ultimate goal is to embed the resource within the curriculum as an element of the work-related learning activities that are proposed for LMJU.

Acknowledgements

The virtual workplace has been developed with help from a large group of colleagues. Thanks are due especially to Keith Crompton (multimedia), Rachael Brewster (multimedia and filming), Wirral Country Park (for provision of staff and facilities for filming) and LJMU graduates and placement employers. The author acknowledges receipt of an LJMU employability fellowship funded by the LJMU Learning Development Unit and the School of Biological and Earth Sciences to enable further development and dissemination of the virtual world of work.

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Developing 'real-world' methods in urban geography fieldwork

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Abstract

While the methodological diversity of human geography is increasing, students often struggle when confronted with techniques that challenge the limits of what they understand to be their discipline's relation to the real world. This problem is amplified by the experimental and incremental nature of certain kinds of qualitative methodologies. This article reports on our efforts, supported by the GEES Subject Centre, to facilitate particular kinds of student engagement with 'real-world' urban spaces, and to allow students to manage the experience of this engagement. We pay particular attention to the use made by students of wiki-sites as tools for managing the interface between field, class, and web-based learning. In concluding, we use our experience to reflect upon the value of the idea of 'real-world' in relation to teaching and learning.

Introduction

One of the key strands of thinking in contemporary urban cultural geography is concerned with what, for want of a better term, can be called 'everyday life'. Put simply, this tradition of thinking is concerned with foregrounding and understanding the 'dailyness' of urban life: those routines, habits, behaviours and objects that seem to allow much of city life to cohere. Developing students' understanding of the importance and value of this tradition involves at least two sets of activities. The first is conceptual, and involves the provision of a set of techniques for thinking about the 'real-world' of everyday urban environments. The second is methodological, and involves allowing students to develop techniques for generating material through research encounters with and within everyday urban environments.

Both sets of activities pose distinct challenges. With respect to the first, students often find it difficult to appreciate the value of thinking about and attending to the everyday life of cities. Why pay attention to what is apparently transient, ephemeral, and familiar, when there are general patterns, overarching structures, and underlying theories to be discovered? With the kinds of methodological techniques students are invited to investigate, such detail can often exacerbate a nascent sense of uncertainty. Perhaps expecting the familiar repertoire of surveys, questionnaires, and interviews, students are invited instead to draw upon an increasingly eclectic range of methods including ethnography, visual methodologies, and performative techniques of various kinds (Latham, 2003). While valuable, these methods have an experimental, incremental character, and they produce material that lacks the reassuring quality of quantitative data.

In what follows, we want to reflect upon our efforts to negotiate the challenges associated with introducing undergraduate geography students to those theories and techniques whose object is 'everyday life'. Our discussion draws upon the insights emerging from work conducted with the support of a GEES Subject Centre small project grant, the award of which allowed us to extend ideas and practices we had previously been developing in embryonic form. Our discussion unfolds as follows: After outlining the specific pedagogical context

within which the project was undertaken, we then focus on four aspects of our attempt to facilitate student engagement with the 'real-world' of everyday urban life. Of these we pay particular attention to how students used wiki-sites as part of the management of projects designed to demonstrate their engagement with the themes of the course. While our experience suggests these sites were only partially effective, we use the insights drawn from the project in order to reflect upon the very meaning of 'real-world' as a way of organising and ordering the added value of certain kinds of pedagogical activities.

Rethinking real-world urban fieldwork

For a number of years we have been involved in running a third year undergraduate fieldtrip course in a European city. The unit consists of two main components. The first component, usually run in late September, consists of a week-long residential field-course, which since 2004 has been based in Berlin. The second component consists of a semester of lectures and seminars delivered upon returning to the United Kingdom. The key aim of the fieldtrip is to allow students to develop a set of techniques for engaging with and attending to everyday urban life. These techniques emerge, in part, from a distinctive intellectual tradition that can be traced through the work of thinkers and writers such as George Perec, Walter Benjamin and Joseph Roth, each of whom exemplifies a style of thinking that foregrounds the fine detail of urban life.

Previous experience had suggested that students often found it easy to engage with the writing of such figures. Yet they, and we, seemed to encounter a number of recurring issues. First, it was one thing asking students to read various thinkers on the topic of everyday life; they also needed to be able to attend to various processes and activities while in the field, and to be able to see the value of paying such attention. Second, a suitable way of presenting the research material generated in the field needed to be found; one that was sufficiently flexible to allow students to be both rigorous and innovative in their accounts of attending to everyday urban life. Finally, given the qualitative nature of the material generated, and the multi-layered accounts we hoped might be produced, students needed to have an effective way of managing group project work. Our efforts to work through these issues can be divided into two parts.

1. Facilitating engagement through deliberate de-familiarisation

Our first task was to render 'the everyday' de-familiar enough for it to stand out as a discrete field of processes and practices. To do this, we provided the students with digital cameras. On one level, these cameras had practical benefits. They allowed students in the field to record, manipulate and interpret greater quantities and quality of visual data; they provided for the more effective integration of field-based activity into class-based work; and they expanded the range and sophistication of assessment techniques used both in the field and in the class. Crucially, however, the

photos and video clips taken by the students allowed them, and us, to foreground certain details, processes and practices that often pass unnoticed. For instance, viewing a video-clip of how people behaved when watching animals at Berlin zoo formed the basis for a discussion of how the complex relations between nature and culture are produced and reproduced through very particular sets of behaviours and performances.

At the same time, we wanted students to be able to use such material as part of a more sustained thematic engagement with everyday urban life. So, having spent four days on the fieldtrip thinking about different elements of the everyday life of Berlin, we then asked students to develop their own thematic project. Inspired by François Maspero's (1994) *Roissy Express*, we assigned groups of six students to a particular 'transect' through the city, consisting of a particular S-Bahn, U-Bahn or tram line. The materials generated by students during their encounters with the real-world, everyday life of that transect were then to be used as the basis for a thematically structured group-project. Our emphasis here was crucial. Rather than constructing a real world problem that students then had to solve by going out into the field, what we wanted to do was allow student experience of the everyday real world to generate its own problematic situation: An emergent and insistent set of questions or themes that could then be developed upon return to Southampton.

2. Assembling the real world cities in virtual space

The second major component of our efforts concerned the use of web-based techniques to allow students to do two things. First, we wanted students to be able to use the material they had generated in the field to develop and assemble group-based projects that were flexible in their structure and multi-layered in their presentation. Web-based assignments are now well-established components of human geography teaching and learning. Indeed, students increasingly demand that material be accessible and available via the web. Furthermore, through sites such as *Flicker*, *mySpace*, and *youTube*, students are active consumers of, and contributors to, the ongoing evolution of webspace. Incorporating web-based work, therefore, provides an important way of linking activities in the real world of the field to the equally real virtual worlds inhabited by students.

Second, we also wanted to allow the students to effectively manage the process of assembling their project. Producing a project like a website is a complicated and often fraught process, but it also provides an important opportunity for students to develop familiarity with project management. To do this, students needed an accessible, easy-to-master environment in which to develop group projects in a structured and formalised way. Wikis, a type of website whose content can be edited on an ongoing basis by a designated group of users, provides such an environment. Wikis have a number of advantages, each of which we hoped would make for more effective project management. Firstly, as a formal project management tool, they provide a series of collectively accessible protocols about the running of the project. These included a project plan and schedule, responsibility matrix, milestone chart, and a project notebook (see Horine 2005).

Secondly, wikis can act as a repository for all the on-going drafts, notes, photographs, etc used in the generation of a group project. Thirdly, the wiki should provide a kind of group forum where the students could discuss ideas, share useful information sources, and so on. In addition, we also hoped to be able to assess students' project management without adding unduly to the existing burden of assessment faced by the students. As wikis contain an ongoing history of changes, they allowed instructors to assess the degree to which things like project milestones and so forth were being met.

Inventing real-worlds

The brevity of this report limits the extent to which we can discuss the results of the efforts outlined above. While we have written in more detail elsewhere about the use of cameras, scenarios, and web projects (Latham and McCormack 2007), we would like to emphasise the degree of *inventiveness* our students have shown in the application of often unfamiliar ideas, to what often seemed like overly familiar environments. In detailed end-of-course surveys and group feedback sessions, nearly all the students who took the course over the past three years have found this organising principle of the fieldwork, both challenging and enjoyable. What do we mean by inventive? We mean, for example, that students discovered ways to use cameras not just to document the world around them, but also to facilitate their encounters with the city. They came up with ways of thinking about everyday urban life that were only possible "because of the camera" (Student Feedback). Similarly, students began to devise their own scenarios for revealing the importance of certain spatial practices in everyday life. And the transect project allowed the students to define the kinds of themes they considered important, themes that could then be explored in a variety of conventional (essays and photographs) and less conventional media (video, interactive maps, slideshows).

At the same time, it is worth reflecting, in a little more detail, upon the value of certain elements of our efforts to help students project manage their engagement with the 'real world' of everyday urban life. In particular, our experience of the wiki, and that of the students, has been mixed. If all the students felt that the wiki had in some sense been useful, then there was, however, a degree of variation on just how useful. One group felt that the wiki and the associated project management tools had provided a valuable resource for both planning and carrying out the group website project. As they put it, because of the wiki

group members did not need to meet up every two days, but could meet less often. The practicalities of sharing and viewing images, video, text etc in general were much easier [than they would have been without a wiki].

Another group described how the wiki "made the group work so much easier – we could edit and comment on another's work so easily".

In contrast, one group described how "at the start" they found the wiki "more of a hindrance setting the thing up, as it took time and we felt we didn't need it." Nonetheless, this group did recognise that "during the final stages [of completing the group project] it was useful in making the group more effective as everyone knew what had to be done."

In addition to providing a space for bringing together materials for use in the group project, all the students found the explicit use of project management tools, like milestone charts and responsibility matrices, helpful. As the group last quoted above wrote, the project management tools “help you organise your time better and focus you on what you have to do and in what order.” In a similar vein, another group felt that the project management element of the wiki made their group more effective. “People were actually required to think about planning, and forward thinking. Thus [the project management framework] made people work to time better than if there was just one deadline.”

This is not to say the project management wikis were an unqualified success. Some students complained about the extra workload they felt had been generated (they wondered why they needed to produce a website and a wiki). Others felt the fact that the wikis were formally assessed added a significant burden to their assessment load. Including the wiki in the final assessment of the course also appears to have affected how the students used the wikis. While all the project groups produced competent project plans, and (from what we can see, and from what they have told us) they also seem to have by-and-large adhered to those timetables and assigned roles, we were surprised at how orderly and tidy the student’s wikis were. Students certainly did use the wikis to post material. The problem was that most of this material was generally only posted after the student responsible for it had already completed a substantial part of their allocated task. Students rarely posted very rough drafts, or ongoing notes and outlines, as we had hoped they would and had encouraged them to do. Nor is there evidence of dead ends or false starts, ideas initiated or left undeveloped, or of lines of thinking whose value had been recognised as limited. In conversation with the students, it was clear that much of their group project work did have a highly tentative, and provisional character to it. Despite this, the fact that the group project wiki was going to be seen by, and more crucially, graded by lecturing staff seems to have encouraged the students to view the wiki as place where they should only show their best side. While it is obviously difficult to draw general conclusions from this, our experience suggests that group project wikis might perhaps be most effective as an un-assessed tool for completing group work projects.

Conclusion: rethinking real-world teaching

To conclude, we would like to make a few comments about the role of the idea of ‘real-world’ research in our project. When we began thinking about this term it had a very particular meaning; it seemed to suggest the necessity of more closely aligning academic activities with those beyond the academy. But this project has also afforded us the possibility of a period of sustained reflection upon what exactly counts as ‘real-world’ learning and teaching. Certainly, given the growing emphasis on employability, an important way of convincing students of the real-world value of certain research techniques would be to develop links with individuals and organisations employing these techniques in non-academic settings. For instance, there is a range of commercial contexts within which students with ethnographic and other qualitative research skills concerned with the detailed analysis of everyday

life are highly employable.¹ Furthermore, with time, we could easily improve the use of wikis. However, such developments would not necessarily define or exhaust the real world value of our teaching. They would only be a complement to the more important effort of designing learning environments in which students can develop a sense of the multiple ways in which ‘real-worlds’ are conceptualised and practised. In introducing students to one tradition of thinking about the real world – that concerned with ‘everyday life’ – the learning environment we designed involved four components: techniques of engagement, field-based group work, web-based project work and project management tools. Such environments are not so much about bringing ‘the real world’ into the classroom, as they are about demonstrating how the real world is always a distributed set of activities and practices at a number of scales and a multiplicity of sites that extend within and beyond academia.

Acknowledgements

We are grateful to the GEES Subject Centre for providing financial support for some of the activities upon which this paper is based. Thanks, most of all, to the students who have participated with enthusiasm in activities the outcomes of which, they (and sometimes we) were often unsure. We would also like to thank Donald McNeill who originally came up with the idea of a group project organised around a city transect. Finally, extra special thanks to Jason Lim who taught the seminar element of the 2007 fieldtrip.

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¹ At Intel, for example: see www.intel.com/technology/techresearch/people/bios/bell_g.htm

Extended work-related placements in developing countries: supporting remote learning and assessment

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Abstract

Undertaking independent project work in overseas locations, and especially in developing countries, can be both a rewarding and challenging experience. Challenges encountered by students in their host country will include: adapting to an unfamiliar physical, cultural and social environment; designing and undertaking informative field research; and having limited communications with family, friends and supervisory staff in the UK. When introducing individual overseas fieldwork into academic programmes, close consideration needs to be given to both logistical and academic issues.

The Geography Department at Bath Spa University (BSU) runs a Foundation Degree in Development Geography, which is designed to increase student employability within the field of development on completion of the degree. A pivotal aspect of this programme is an extended field visit to a developing country, where students undertake a work-related placement and design and implement their own small-scale research project. In 2005-06 the department received GEES Subject Centre Small-Scale Learning & Teaching Project Funding to undertake research into supporting remote learning and assessment, in relation to our overseas placement module. Based on recent experiences of staff and students, this article reviews aspects of communication, student support and assessment that should be considered when designing independent overseas fieldwork.

Introduction

Work-related placements are becoming increasingly common within the Higher Education sector due to increasing emphases on employability. In attempts to integrate employer needs and academic study, many placements occur on a one day a week basis, or in a block, either during or following an academic semester (Yorke and Knight, 2004). In contrast, the logistical and academic issues involved in designing independent overseas research are wide-ranging and little literature has been written explicitly concerning extended independent work-related placements (Nash, 2004) as distinct from supervised long-haul group fieldwork (McGuinness and Simm, 2005; Simm and McGuinness, 2004). Robust consideration of health and safety issues, learning support in the field and placement assessment needs to be undertaken in order to provide an effective and safe learning experience for students. Based on recent curricula developments and overseas research undertaken by staff at Bath Spa University (BSU), this review provides advice on setting up overseas placements, supporting remote learning and designing appropriate assessments.

Overseas placements

Separate from academic programmes, many opportunities exist for overseas travel and work-related activities, often as gap years before, during, or after University (Hindle and Bindloss, 2005). Popular placements include summer camps (such as *Camp America*, *British Universities North America Club (BUNAC)*; *Teaching English*

as a Foreign Language (TEFL); and undertaking voluntary work in developing countries through Non-Governmental Organisations (NGOs) or *Voluntary Service Overseas (VSO)*. Making constructive use of overseas travel is seen by HE and by employers as a valuable experience, broadening skills and making students more employable, a need which young people are increasingly aware of.

Several companies cater to the gap-year market, including *GAP Activity Projects*, *Teaching and Projects Abroad*, *Travellers Worldwide*, *Raleigh International* and *Global Adventures Projects*. These organisations provide: i) a structured voluntary experience, ii) good standards of in-country support, iii) pre-departure information and induction, iv) on-going relationships between the local community and the company, and v) some gearing towards personal development (for example, *Raleigh International* stress the development of teamwork and leadership skills). Disadvantages in taking this type of placement could be that: it may feel too managed; interaction with the local culture can be variable (across companies and locations); costs are high; and occasionally projects may have been set up by the organisation, rather than providing a 'real' experience (Hindle and Bindloss, 2005) where project work is fully integrated with community needs.

Undergraduate fieldwork

Overseas fieldwork at undergraduate level falls into three types: supervised (staff-led), semi-supervised (indirect supervision) and independent (remote supervision). Fieldwork at different levels should reflect progression within the degree programme, so level 1 work may involve an excursion of the Cook's Tour variety, with more student-centred and independent learning becoming dominant in the later stages of the degree programme (Kent *et al.*, 1997).

While a number of opportunities exist for overseas fieldwork at university (through dissertation work, educational exchanges and one year language placements) few departments offer the opportunity to undertake independent fieldwork in a developing country. This is partly because this is seen as a high risk endeavour, with issues including personal liability, health and safety and ethics, and the problems of establishing overseas support networks. This needs to be in accordance with the new British Standards: Specification for the provision of visits, fieldwork expeditions, and adventurous activities, outside the United Kingdom (BS8848:2007, ISBN 978 0 580 505 03). Academic support of student project work is also more difficult without the option of holding face-to-face meetings. It is paramount to establish guidelines for remote support through established communications networks and to have strategies in place for crisis-resolution in the case of projects becoming untenable (Simm and McGuinness, 2004).

Setting up the 'Field Experience' module

The Foundation Degree in Development Geography (FDDG) at BSU, which began in 2005-06, is innovative in offering independent fieldwork for undergraduate Level 2 students. The 'Field Experience' module (see Box 1) enables students to experience overseas project work and research and significantly

Box 1: Field experience module

Background

- Field Experience (60 credit module) in year 2, semester 2.
- 3 month placement in developing country
- Placement with Teaching & Projects Abroad (T&PA) (www.teaching-abroad.co.uk) who offer a choice of 18 destinations and various placements, including Conservation, Care and Community, Teaching, Journalism and Medicine.
- Students negotiate placement destination and academic project (which may or may not be on an associated topic) with BSU tutors.
- T&PA organise placement, provide field supervisors and offer full logistical support (e.g. translators, medical care).
- T&PA offer induction and familiarisation programmes to students on arrival at destination.

Project planning and assessment

- Pre-placement planning (second semester of year 1): students participate in workshops and tutorials to select a placement, design a research study and undertake secondary research on the host country.
- Students are assigned an academic tutor (at home institution) and a T&PA supervisor (in the destination country)
- Debriefing Tutorials on return from placement.
- Assessment Items:
 - Investigative project report (50%) 5000 words
 - Seminar Presentation and Abstract (20%) (20-minute presentation at the Department's Annual Research Symposium)
 - Reflective diary extracts/summaries (30%) 3000 words
- Final reports are supplied by students to community contacts at the destination.
- Learning outcomes:
 - Demonstrating an understanding of development issues relating to the country hosting their field placement
 - Applying previously acquired geographical skills and knowledge to a small-scale investigation in a field-based setting
 - Relating the outcomes of a small-scale field based investigation to development issues relevant to the host country
 - Reflecting on personal field experiences and using these to inform career decisions
 - Deploying a range of subject and key skills in oral and written presentations

increases their employability in the field of development. While the degree programme attracts a proportion of mature students, most have limited experience of overseas travel or NGO work. Thus, from the start it was essential to integrate student support mechanisms into the fieldwork programme. The first step involved setting up placements in cooperation with a partner, *Teaching and Projects Abroad (T&PA)*, who also provide vital overseas support, supervision and a point of contact 24 hours a day.

Using a placement provider, as opposed to establishing overseas networks from scratch, enables a greater variety of placement choice for students and provides on the ground

support and advice. *T&PA* has a legal agreement with the university and students have to sign up to *T&PA* terms and conditions stating commitment to their chosen placement (*T&PA* supervisors sign a statement to show that students have completed their placements). Specialist placement companies, while perhaps offering a less cutting-edge experience than NGO work, provide appropriate logistical support and enable students to complete pre-planned placements and undertake their own research, while engaging with the host culture and developing language skills. This experience provides a unique opportunity for students planning subsequent work in the NGO sector.

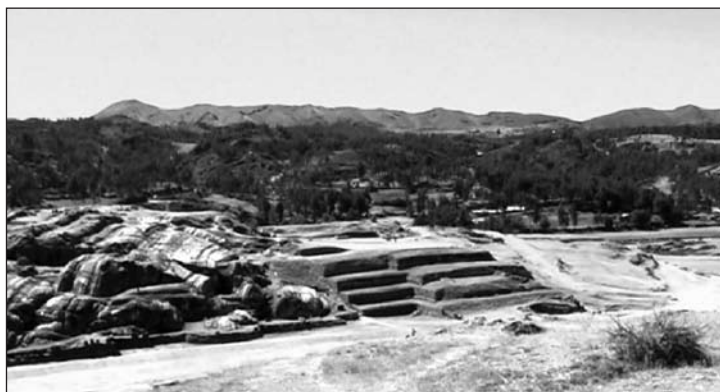


Figure 1: Sacsayhuaman archaeological site, Peru (photo credit: Winlow, 2006)

Thorough pre-placement training is embedded in the FDDG programme through workshops on fieldwork design, assessment, health and safety and research ethics; while individual fieldwork planning and preparation includes familiarisation with appropriate country guides and literature on fieldwork (and research methodologies) in developing countries (for example Desai and Potter, 2006; Laws, 2003). All students design their own research project (which can either be related to their placement, or be separate from it) in collaboration with an academic supervisor who also provides guidance during the research process.

For modules based on independent fieldwork it is imperative that effective support and communications systems are established to deal with both academic and pastoral concerns



Figure 2: Selling vermi-compost at market, Rajapalayam, Tamil Nadu, India (photo credit: Simm, 2006)

(such as culture shock and isolation) experienced by students in their host location. Guidelines for appropriate levels of communication relating to academic projects need to be agreed (both to provide adequate levels of supervision and to ensure equity of supervisory provision as much as possible), progress should be monitored and a recognised point of completion of the research should be agreed with each student.

Project aims

The aims of our funded project were to consider ways of supporting the FDDG students whilst undertaking placements in developing countries. This involved staff undertaking fieldwork in

Box 2: Case study 1: Inca Projects, Sacred Valley, Peru

- T&PA Inca Projects are unique archaeology-based projects.
- Inca Projects volunteers typically spend 4 days a week on the current archaeology project at Sacsayhuaman, including 2 days digging and 2 days working with native plant species (e.g. potting them, building shelters (see figure 2) for future habitat restoration at the site).
- Inca Projects volunteers receive a weekly archaeological lesson and Spanish lesson.
- Archaeological work is arranged in cooperation with the Instituto Nacional de Cultura (I.N.C.) and there is currently a two-year agreement in place with the INC for the Inca Projects work at Sacsayhuaman (started in 2006).
- Inca Projects volunteers regularly have the opportunity to be involved in hikes to remote locations and archaeological sites.
- Inca Projects volunteers are issued with an INC pass allowing them free access to all archaeological sites.
- Volunteers on all projects are based with families (who provide accommodation and food) in towns along the Sacred Valley, including Urubamba, Pisac and Calca.
- Communications: Internet connections are cheap and relatively reliable; there are many internet cafes in Urubamba and Cusco; some volunteers have to travel up to 1 hour by bus to access these. Volunteers can use the phone of their host families, using a phone card (which can also be used in local public pay phones, available in each town). Mobile phone access is intermittent; text messaging and international calls can be made using a Tri-Band phone.
- Transport: Buses are regular, but crowded; open taxis are available for local journeys. All volunteers are based within one hour from T&PA office in Urubamba.
- Contacts: Each volunteer is issued with an emergency contact card (providing phone numbers for T&PA) and given a booklet containing names and local phone numbers of current volunteers (updated monthly).

selected placement locations in order to establish local contacts, to assess field logistics for learning and pastoral support, and to consider scenarios for assessment. Fieldwork was undertaken by two staff, in Peru and India respectively, who each registered on a T&PA placement (see Box 2). The main aims of our field research were to:

1. Design and implement a communications checklist
2. Shadow T and PA supervisor(s)
3. Experience different placements (including: Teaching, Care, Inca Projects, Conservation, Medical)
4. Talk to volunteers
5. Keep reflective diary and field note records
6. Write up weekly summaries of experiences for dissemination via Minerva (Virtual Learning Environment (VLE))
7. Keep electronic records (digital photos, video-diary)

This research enabled departmental staff to get an overview of: the suitability of the placements for our students; the role of T&PA in the host community and the effectiveness of their support networks; aspects of communication; and suitability of assessment types. This research will underpin the advice and support given to students taking the 'Field Experience' module. The following sections focus on: the planning and implementation of a Communications Checklist; establishing a VLE; and assessment using Reflective Diaries.

Communications checklist

Although it is difficult to quantify the quality and provision of communications at distant localities, a semi-quantitative pro-forma can be used to compile useful information. In order to assess the communication issues in different countries, a 'Checklist' was devised. Two variations of this pro-forma were designed: one for staff and one for students. The staff checklist list is divided into 6 sections, with the greatest emphasis on communications. These sections are as follows:

1. Communications. Information on i) phone communications (mobile and public); ii) Internet access (including access to e-mail (university account and yahoo/hotmail) and to the Minerva site- see below); iii) 'Snail' Mail; iv) Data downloads and compatibility of hardware and software; and v) Translation.
2. Transport, including questions on internal flights and local transport (including buses, trains, taxis and rickshaws).
3. Finances. Questions on access to and availability of exchange facilities and cashpoints.
4. Suitability of assessment types
5. Suitability of placements for the FDDG programme.
6. Health and Safety and Ethics (in addition to the School Health and Safety and Ethics forms which all students complete in advance of fieldwork). Health and Safety questions include perceptions of personal safety, storage of belongings and equipment, adverse weather conditions and accessibility to field sites. Ethical questions include: perceived integration of volunteers and T&PA in general with the community, and the appropriateness of using expensive equipment.

The student checklist is the same as the staff checklist, but without Part 5 which relates to the strategic planning of the award. Student feedback is asked for in relation to the relevance of assessment items, meaning that there is the possibility of amending items in the future, in accordance with practical and logistical issues.

All staff and students who undertake a placement are requested to fill in the checklist. The aim is to build up a repository of information in order to gain a better understanding of communication issues in different areas with regard to planning and supporting future placements. Data collected via the proforma also allows the documenting of health and safety risks, which should be monitored both through pre-visit risk assessment and throughout the fieldwork (Couper and Stott 2006). The student communications checklist can be updated by students throughout their placements. This proforma provides structured guidelines to students to accompany induction by T&PA at the destination and prompts students to make initial contact with academic tutors at the home institution. Students are requested to communicate with academic tutors (via phone, internet or fax) within an agreed time-period on arrival and to get in contact every couple of weeks following this (although time-frames may vary according to level of communications provision). Mobile phone technologies have improved in many countries and can be accessed using tri-band or quad-band phones (or by using a local SIM card). In addition, internet facilities (which often include Skype, allowing cheap international calls) are now more widely available, although speed and accessibility can still vary greatly between different localities.

VLE

The use of on-line VLE software such as Blackboard can provide a valuable resource for student support. At BSU the Blackboard 'Minerva' environment is used across the institution. A Minerva module has been designed to support students registered for the 'Field Experience' module. This VLE can be used by students in the pre-planning stages, during their placement in the field, and at the post-project writing up stage. Our VLE currently includes: advice on project planning, examples from staff and student reflective diaries (the first student has recently returned from her placement in Swaziland), weekly newsletter summaries of experiences from recent staff placements, and an online discussion board. Using discussion boards while in the field enables students to share experiences, provide mutual support, and discuss progress. The boards enable the posting and answering of queries and enable communication between BSU tutors, students on placements in different countries/ continents and students at the home institution. Students are encouraged to e-mail occasional summary newsletters which will also be posted on the VLE. Of course, the use of the VLE depends on available technologies, download times, reliability of power, reliability of the home network or server and access to the nearest internet café in remote and distant locations. E-mail communication is generally more reliable than accessing VLEs so can often be the best and most cost-effective form of communication.

Reflective diaries

Recent literature has emphasised the importance of encouraging 'active' and 'deep' learning through teaching methods that encourage experiential learning (Biggs, 2003; Healey and Roberts, 2004). Gold *et al.* (1991) note that the main objectives of fieldwork should include the development of academic skills (including observation skills, experiential learning, experiencing 'real' research) and of personal skills (including group work and leadership). Our 'Field Experience' module has been designed with these objectives in mind. However, it is also important that the learning outcomes and assessment are closely linked to the wider objectives of the fieldwork.

While trying to ensure equity of field placements and supervision as much as possible, each student will gain a unique academic and cultural experience. Students may also encounter different personal, academic and logistical challenges which relate both to the positionality of the individual researcher and to unique aspects of the host culture and environment. In encountering a new and culturally different country, an aspect of self-reflection can be built into the assessment. In our fieldwork in Peru and India one of the aims was to consider the effectiveness of different assessment methods, so both staff took detailed field notes and made reflective diary entries. Students taking the field experience module are asked to write a reflective diary throughout their placement and are encouraged to consider both cultural differences and academic aspects relating to development issues. As part of the final assessment, students submit selected extracts from these diaries. The assessment items are closely linked to learning outcomes as shown in Box 1. Further consideration of the success of this method will be the subject of a future paper.

Recommendations

From our experiences of introducing the FDDG programme and the associated fieldwork placements, the following guidelines are suggested for consideration when planning independent overseas fieldwork, particularly in developing countries.

- Embed overseas fieldwork in academic programmes (for example, as a separate module)
- Work with a reputable and experienced partner which has overseas support networks in a range of countries (ensure that flights are covered by ABTA-ATOL and that placements are fully covered by insurance)
- Ensure the fieldwork is designed to encourage the development of academic skills and personal skills.
- Design assessment to encourage active learning and reflection on both the academic and cultural experience of working overseas
- Ensure that there are procedures in place for students which include: i) pre placement planning; ii) support whilst undertaking research abroad (both from supervisors in the UK and on the ground); iii) debriefing; iv) final dissemination of results; and v) reflection (see Kent *et al.* 1997 and Gold *et al.* 1991).

- Mentoring: Returning students can be asked to share their experiences and expertise with the following year's students in their pre-planning stages (and can provide valuable information, inspiration and support).
- Design and implement a communications checklist and establish guidelines for first contact from destination and frequency of contacts.
- Provide student support through a VLE and/ or e-mail
- Plan staff visits to placement locations, every few years, to ensure compatibility with degree programme and effective in-country support systems
- Ensure that all placements your students participate in are 'real' placements, which are embedded in the community (and not organised singly designed by the placement provider).

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Personal Development Planning (PDP) really happens at work

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Abstract

There can never be one approach to personal planning, and what is effective for one person probably will not work for the next. Additionally, very few students see the connection between planning whilst at university and the planning processes used in the workplace. The project reported below was an HE Academy GEES Subject Centre small grant funding project, and this paper reflects on University of Leeds (University) student responses to materials designed to help them to develop a clearer understanding of the role of PDP in the workplace and to gain an insight into the longer term benefits of personal planning and reflection. Student responses (*in italics*) to each activity are used to highlight some of the learning benefits.

Background

Lumsden (2005) makes the point that 'introducing and embedding PDP is not something that comes naturally' and Kneale (2004) has highlighted that many students are not especially keen to participate. As Peters (2006) stated '...experienced practitioners consistently report a wide variety of responses, ranging from creative engagement, through compliance, to active resistance' amongst their students. Whichever model of curriculum and institutional embedding (Jackson and Ward, 2004) is chosen, a student needs to know that the process has relevance and benefits. This is especially true where the planning process is extra curricula, and 'not for credit'.

The Materials

To obtain information on PDP procedures in the workplace, interviews were undertaken with an employee from each of three very different organisations—a charity, a local authority, and a private company. These organisations have their own PDP internal processes. The interviews explored the employees' views on the benefits and drawbacks of the processes and the procedures adopted. The interview transcripts were used as the basis for a set of four activities that can be run with students in tutorials and workshops. These materials are available at: <http://www.geog.leeds.ac.uk/courses/other/performance/pdpindex.html>.

Student responses to staff development in business

The most straightforward activity simply asks students to discuss the three interviews focussing on one of the following three themes. 1) How the interviews fit with your understanding of the role of PDP. What is new? What is unexpected? 2) Given this insight into workplace use of PDPs, how would you re-design your University / Department / School PDP to make it work better for you? Or 3) How could your own PDP practice develop as a result of your knowledge of the business schemes?

Many students expressed surprise that ongoing training and development exists in the workplace. There was a feeling that you studied at university and then became employable based on what you had learnt. The idea of continuing to learn on the job and through going on courses was a revelation. A second theme

"I will try to plan more clearly and in distinct sessions, so that when I have done a section I feel like I have reached a goal."

focused around the statements that being made to fill out forms can cause frustration. By the end of the session there was a clearer understanding that the form is not the vital part of PDP. *It is the process itself that is important, the conversations that you have with your manager. The form is just the starting point.*

Creating a PDP for a small business

Working in small groups, students used the interviews and copies of PDP forms from a number of organisations to create a PDP process for a small business. The aim was to give them an insight into how the PDP process can be designed and structured.

The responses showed students beginning to appreciate the importance of the PDP process, commenting that they thought it gave the company a chance to develop its workforce and provided the employee with the support they need to progress in their career. Some students engaged with the concept of enlightened self-interest, the idea that if the employee is happy and satisfied then they will be more efficient thus benefiting the company.

There was a general feeling that a variety of issues would need to be considered by the company to make the process as useful as possible and that different types of company would benefit from different approaches. The PDP process is definitely not a 'one-size fits all' concept.

This is helpful because reflecting after the workshop, some students could see ways to adapt their own practices. *"Would probably be a good idea to have a weekly plan of what I want to achieve and how I am going to plan my time to ensure work done on time."* And *"I will try to plan more clearly and in distinct sessions, so that when I have done a section I feel like I have reached a goal."*

While these comments feel a little like New Year's resolutions, there is a raising of awareness through the process.

Exploring personal experiences of PDP in the workplace

Working in groups of three, two people interviewed a student who has had previous experience of the PDP process, either in vacation/gap year work or full time employment. The interviewers sought to understand the practical and personal application, impact and outcomes of the PDP process for the interviewee. The interviewers then created a mini presentation highlighting the main processes, benefits and disadvantages that their colleague had outlined.

The students felt that this activity emphasised the value of PDP in terms of providing employees with structure and direction. *We gained an appreciation of how there are very different approaches to PDP in different businesses.*

It also provided participants with useful experience of interviews from both sides of the desk. Students realised that being able to frame pertinent questions is a valuable skill and that sometimes it is easier to answer questions than to ask them and that interviews lead in unexpected directions: *Questions we asked didn't get neat answers - the answer spilled over into other topics.* The benefits of effective communication and listening skills were also highlighted by the participants.

Summative assessment can link research and teaching here

Students were challenged to find a colleague, relative or friend who is using PDP at work. The students used the interviews as a background to develop their own questions to research that person's understanding and use of reflection and planning in their own workplace.

Few students had realised that the use of PDP was so widespread. Everyone found someone to interview. They expressed surprise that nearly everyone they asked had had some experience of PDP (*You don't realise that this happens*), that people were keen to talk about it, and that the people interviewed were generally viewing the process as a positive thing.

Students were definitely engaging with the concept that PDP does exist in real life, is very much embedded in the workplace and is here to stay. *When we first talked about it our group agreed you just made it up and that is kind of what happens at school and here. You do it just for the teacher. Talking to Elle, you could see her line manager is the person she works with all day and talks to every day, so making it up isn't an option. And she was really positive about it helping with doing a better job.* Reflection and planning were seen as normal and useful.

Evaluation

The responses highlighted above were made either during the feedback sessions or in students' reflective logs. In addition, student responses to the activities were recorded by an independent evaluator who observed the first workshops. The diversity of response is encapsulated in these two statements *It didn't help me at all, didn't enjoy it, couldn't see how it was benefiting me;* and *In my experience I have seen people using it to advance their career.*

The evaluator observed how students worked on the activities and reported that all participants worked with enthusiasm and that energy levels were high. All groups paid attention to the instructions they were given and quickly got to grips with the tasks. There were high levels of engagement with all members of a group appearing to be involved and equal levels of engagement from both sexes.

Individual students were asked to give their 'gut' response during and towards the end of the session by thinking of a word or phrase that best summed up the session for them. The results were diverse: *Inspirational; Fun; Useful; Highlights importance of teamwork; Difficult; Confusing; Captures your imagination; Makes you think on your feet; Disorganised; Made me think about something I'd never considered before.*

A focus group was held by the independent evaluator two weeks after the workshop. Eight students, four women and four men, discussed the activities generally and focussed on

- What does PDP mean to you?/How has the session changed what PDP means to you?/What does it mean to you now?
- What will you do differently as a result of the session?
- What would you change to improve the workshop?

A significant outcome of the focus group was that participants' views of PDP and the session seemed to relate directly to their experience of personal planning. Those that had little exposure to PDP or the workplace were generally 'reluctant participants' who couldn't see the point of PDP. They viewed it as just learning what the employer wanted to hear. These students were also the least likely to have found the session easy and struggled to relate PDP to their current circumstances.

In contrast, those that had experience of workplace PDP processes were much more able to engage with the benefits of PDP and were ready to take it seriously.

The former group can be described as 'postponers': For them PDP was a long way off, not relevant to their current life situation, something *not to be bothered by, until I get a real job.* Interestingly, participating in the review session enabled these students to hear other more positive reactions to PDP, possibly the most powerful way of challenging their beliefs.

It seemed that most people had altered their thinking on PDP, if only in as much as they had begun to think about it at all. Those people who thought that there might be something in PDP for them spoke of the practical outcomes of the session; that they now had more knowledge of the process, they could see how a PDP might be formulated, that their interview skills had developed and how they might use PDP to advance their career. Even those participants who felt that *the importance of PDP is exaggerated* still believed that *the session had been beneficial.*

The students who had engaged most with PDP were ready to make changes in their own personal planning as they wanted to develop themselves now and push the boundaries. They felt that it was worthwhile to put a lot of effort into personal planning.

More cautious participants confirmed that they had *learnt a great deal from the session* and that it had opened their minds to the concept of PDP. They might not be about to change their own behaviour in the short term but felt that once in employment they would be *actively find out about the employer's human resources and planning policies.*

Even the most reluctant 'postponers' felt, on reflection, slightly more positive about PDP through the experience of hearing their peers' views challenge their own evaluations – getting the message from their peers being more powerful than from the lecturer.

The students' approach to and understanding of the relevance of the planning process before these workshops was very mixed. This is not a 'magic bullet' set of materials. However, raising issues around PDP use with Level 2 students, has the potential to re-invigorate understanding and application. Some students could see new reasons to engage with the process and some could see that the University planner was not the only format. Raising awareness of alternative processes and proformas gives people

the opportunity to find new ways to reflect. As one commented: [The] whole session emphasised [PDP's] importance. Before I thought it was a waste of time, but now it may be worth putting the effort in. This quote nicely encapsulates how making the workplace common can change the student attitudes to PDP.

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Acknowledgements

Thanks are due to Maggie Boyle, Skills Centre, University of Leeds for the evaluation; Samantha Aspinall for interviews; and HE Academy GEES Subject Centre for the small grant funding.

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Re-orienting a physical geography skills programme for careers relevance: An Environmental Baseline Teaching Simulation

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Abstract

Higher education institutions are under increasing pressure to produce 'employment-ready' graduates. It is necessary to investigate practical and effective ways to embed employability skills within existing degree programmes and structures in order to meet these external pressures and minimise course disruption. This paper describes a case study where a number of traditional 'research and skills' focussed physical geography practical sessions have been re-orientated to increase the overt careers relevance of the material covered, by simulating carrying out an environmental baseline survey, including field and laboratory data collection and analysis and report writing. This project was designed and evaluated in collaboration with an environmental consultant in order to ensure the careers relevance of the project. The project proved popular with students, who appreciated the 'real worldness' of the exercise.

Introduction

The QAA Code of Practice for Career Education, Information and Guidance is intended to "help higher education institutions to ensure both that they are meeting students' expectations in respect of their preparedness for their future career, and that they are producing graduates equipped to meet the demands of the employment market of today and tomorrow" (QAA, 2001). In addition to these general pressures on addressing employability issues in higher education, research shows that the majority of graduates enter higher education in order to improve their employment prospects (e.g. Gedye *et al.* 2004), yet there may often be a paucity of direct careers related material presented throughout their degree courses. However, other higher education practitioners question the growing emphasis on employability in higher education teaching and learning, due to a presumed risk of an erosion of the development of "critical intellectual skills" (e.g. Johnston, 1997, Marantz and Warren, 1998). On the other hand, geographers in the UK have been accused of being less successful than other disciplines in forming effective links with the world of employment (Jenkins and Healy, 1995). Pressures within higher education from increasing student numbers, reduction in the unit of resource for teaching students (Johnston, 1997), and decreasing staff:student ratios present further barriers to the wholesale redevelopment of course material, and therefore solutions must be sought that try to balance these various pressures, such as ways to re-align existing course material. Realistic work-based simulations have been cited as one way of increasing students' awareness about employment issues (Kneale, 1999). The "Environmental Baseline Teaching Simulation" project presented here provides a case study of how a traditional undergraduate "research skills and techniques" practical programme run as part of an established level 2 Physical Geography degree programme can be re-orientated to provide more explicit applicability to potential graduate employment avenues, and hence meet the challenges of The QAA Code of Practice for Career Education, Information and Guidance (QAA, 2001).

As part of the "Environmental Baseline Teaching Simulation" project (EBTS) a publicly accessible website has been developed and can be found at www.esci.keele.ac.uk/ebts. This website provides: 1) further details on the project and its evaluation; and 2) a resource-set based on data collected from these practical sessions to enable other practitioners to run similar projects, without the need for field data collection.

The Environmental Baseline Teaching Simulation project

The "Environmental Baseline Teaching Simulation" project provides students with the opportunity to conduct a simulated environmental baseline survey. Such surveys are routinely carried out as part of Environmental Impact Assessments undertaken in support of Planning Applications and can form a major part of the work carried out by environmental consultancies, the destination of many geoscience graduates. This project has been developed drawing on the views of an environmental consultant (Technical Director of Geological Services at MJCA), and current literature on employer requirements of "geo" graduates (e.g. Owen, 2001; Penn, 2001).

This project has been developed from a series of more traditional "research skills and techniques" orientated practical sessions, originally designed to introduce students to a range of subject-specific technical skills (both field and laboratory based) associated with the collection and analysis of soils and surface water, from the wooded estate in which Keele University is located (Figure 1). These practical sessions were assessed through the individual completion of a workbook. Although this form of assessment provides clear guidance to the student, useful for large class sizes, such 'box-filling' or 'closed' style of assessment seems likely to encourage surface rather than deep learning, with students unable to see the broader implications of the tasks they are carrying out, or engage fully with the analysis of the data collected. In order to encourage deeper learning, and develop writing skills relevant to many graduate jobs, it was decided to assess the practical sessions through a more "open-ended" environmental baseline report. The report was based on the data that the students collect and analyse in the practical sessions, following the structure and learning outcomes of the original practical programme. In addition to a group report, the students are required to submit an individual "personal reflection". This includes: a series of questions requiring the students to comment on the potential errors of different aspects of the data collection and analysis; a reflection on the perceived value of these practical sessions (principally for future project development); and a "learning matrix". This learning matrix requires students to rate their knowledge and understanding of some of the learning outcomes/skills covered in the project, both prior to and following these practical sessions. The student "personal reflection" was designed to address several aims. Personal experience suggests that there is a tendency for students to



Figure 1: The major lake within the Keele University campus used as the study site in the Environment Baseline Teaching Simulation

believe “as gospel” numbers generated through data collection, with little consideration of potential errors generated through the data collection process. The first part of the evaluation was, therefore, designed to encourage students to reflect on potential errors during the data collection. Questions on how well students worked as a group and how this could be improved were also included to encourage students to reflect on their group working experiences, teamwork being viewed by final year students as one of the most important learning outcomes in terms of future career prospects (Haigh and Kilmartin, 1999).

The Environmental Baseline Teaching Simulation has been run in two successive years with modifications being made in the second year as a result of student evaluation and reflection on the project. The field activities were carried out in a small lake drainage basin situated within the Keele campus (Figure 2). Students worked in groups of four to five and were involved in the following activities (not all of the activities were run in both years):

- Project planning, including deciding on what of the available data was necessary to achieve the project’s aims, based on an assigned budget
- Risk assessment of field activities



Figure 2: A map of the upper lake basin within the Keele University campus used as the study site in the Environment Baseline Teaching Simulation

- Field data collection, including: collection of surface water and groundwater samples and *in situ* measurement of physicochemical characteristics; measurement of groundwater levels; determination of stream discharge using a tracer dilution method; description of soil profiles and soil sample collection.
- Laboratory analysis of samples, including: soil organic carbon content; soil moisture content; soil grain size distribution analysis; soil pH, EC and alkalinity from soil leachates.
- Data analysis, including: determination of net precipitation from meteorological data from the Keele weather station; determination of groundwater flow direction and hydrological continuity between surface water bodies and groundwater; the water budget for the lake; water quality analysis of surface water and groundwater samples.
- Production of an “environmental baseline survey” technical report.

The skills and knowledge that this series of practical sessions aim to develop are consequently wide ranging and include “personal transferable skills” in addition to subject and career specific skills, including: 1) subject-specific field and laboratory skills; 2) group work and leadership skills; 3) an awareness of environmental consultancy careers; 4) written communication skills in the form of a technical report; 5) project planning and working to a budget; and 6) IT and numeracy skills.

Evaluation of the EBTS project

Student evaluation

Student evaluation of the project was carried out in two ways: 1) questions incorporated within the “personal reflection”; and 2) an interview with a student who had carried out the practical sessions in their original form and then as part of the Environmental Baseline Teaching Simulation project.

Student reflections

Ninety percent of students rated their enjoyment of the series of practical sessions as between 3 and 5, on a scale of 1 to 5 (with 5 being very enjoyable). Students were asked to reflect on what were the best and worst things about the project. By far the most popular element was the collection of data and fieldwork. Other aspects that were favourably viewed by several students included carrying out spreadsheet-based calculations, working in teams, and the laboratory analysis. Some students (although relatively few) referred explicitly to the “real world” connections, one student writing, that the, “*real lifeness made it a lot more interesting*”. In both years students referred to the perceived relevance of the skills learnt, responding that they enjoyed, “*learning the methods used by professionals that could one day be crucial to our careers*”, and that they valued the “*practical skills which could be of use in careers*”. The aspects of the project that were least popular with the most students included, the spreadsheet calculations required, writing

up the report and some aspects of the data collection, analysis and interpretation. Several students referred to problems associated with working in groups, including the sense of “*doing more than [their] fair share*”. Clearly, problems arise as a result of working in groups and there is some difference in what students enjoy, however in general, the students seemed to particularly appreciate collecting field data and the careers relevance of the project. Eighty eight per cent of students have a greater understanding of careers available in environmental consultancy as a result of this project.

The learning matrix was designed to help students reflect on what they have learnt during the project. Comments on the usefulness of this “learning matrix” included, “*it gives a list of all the skills used during these practical sessions which is useful*”, “*shows how much [I] actually haven’t understood and possibly that I should have put more effort in to it*”, “*it does give me some confidence in knowing that my knowledge has improved over this short period*”, and “*definitely tells me the practical has taught me well*”. This suggests that the matrix is useful in highlighting the key skills covered and the students’ grasp (or otherwise) of them, and importantly, in giving students confidence in their learning. The feedback from students on the learning matrix suggests that it was seen as a useful exercise, with 82% of students finding the matrix quite useful to very useful in both years the project was run. The role of reflection is clearly valuable in allowing students to get the most from their education while also enhancing employability and enterprise skills (Philip, 2006).

Student interview

In order to evaluate the student perception of the changes made to the practical sessions, an interview was held with a student repeating the year, and who consequently took part in the practical sessions both in their original form and in the first running of the Environmental Baseline Teaching Simulation project.

One of the major differences that the student commented on was the change in assessment from a very structured workbook to a less structured report. The student stated that looking back on the practical sessions the report seemed a better assessment, providing greater training for the forthcoming dissertations and a better learning experience by encouraging the student to think about the final conclusions and the “place” of the different aspects within the full project. The introductory presentation by the collaborating employer at the start of the project was seen as a “really good idea,” showing that it was not just an “academic piece of work”, and emphasised the employment context of the practical sessions. The student referred to a prior lack of awareness of different geography employment options and thought that this sort of project was a good way of showcasing potential employment avenues. Overall, the EBTS project was seen as an improvement on the original practical sessions, particularly as the report assessment involved much more “tying” together of material. The student was very positive about the changes, particularly appreciating the increased employment context, feeling that this sort of activity could be increased within the degree programme.

Employer evaluation

During the planning of the Environmental Baseline Teaching Simulation project considerable input was provided by the Technical Director of Geological Services at the environmental consultancy, MJCA. Initial discussion about the skills portfolio of an ideal graduate employee helped inform the learning outcomes of the EBTS project. This collaboration also provided the opportunity to make the simulation more realistic, by providing the clear legislative framework under which such work is typically carried out. It was also decided that the consultant would present the introduction to the project and the context of Environmental Baseline surveys and Environmental Impact Assessments directly to the students (hence also introducing the students to figures from local employers), and that the consultant would be able to provide additional feedback on the completed reports.

From the employers’ perspective first degree, (BSc and MSci) graduates often lack the skills that enable them to make the transition from university to employment. These skills include the ability to draw together disparate sets of information from diverse sources to form a coherent evidence- based argument that can be communicated in the form of a technical report. All too often it appears that the employer must train new graduates in these skills, the reason for which may in part lie in increasing modularisation of higher education which results in students being trained to pass exams on discrete topic areas rather than allowing the development of independent thinking.

The Environmental Baseline Project is considered valuable in addressing some of these deficiencies as it forces students to make choices over which data should be used, and based on the data available to make a holistic assessment of all the data on which to prepare their report. This method is far more akin to the techniques that will be used in industry and is likely also to provide a less superficial learning experience. Rather than eroding “critical intellectual skills” as some would argue is the case (e.g. Johnston, 1997) such exercises do the opposite and actually help develop the “critical intellectual skills” that the current modularised forms of higher education teaching do not. Such reports also illustrate to students the potential relevance of their academic studies to their future careers.

It is considered from the employers’ perspective that all too often those working in higher education feel that the involvement of future employers somehow taints their academic credibility, whereas from the external perspective the result is that teaching is occurring in isolation from the reality of how the knowledge and skills that students develop will be used. There appears to be some reluctance at least in the geography and earth science spheres of higher education to engage with industry beyond those companies who operate in the energy sector. It is not known whether this is through ignorance of the diverse range of potential employment sectors or a belief that there is an unwillingness to engage with academia. Based on a number of recent visits to university careers events it is clear that many students in geography and earth sciences are unaware of potential career opportunities in environmental consultancy for example. It is considered that through engaging directly with industry across a number of sectors that teaching can be made more relevant to the future employment destinations of the graduates, and rather than eroding

the development of critical intellectual skills that these, on the contrary, will be developed further.

Discussion

A study by Gedye *et al.* (2004) reports that employment considerations are an increasingly important reason why students study for a degree. However, current geography *undergraduates* had a much greater belief that a geography degree would open up a wide range of career options than geography *graduates*, suggesting a potential change in the perceived usefulness of geography in terms of graduate employment when graduates are trying to enter the workplace. One student responds,

'I enjoyed the course because of my personal interest in geography but it did not enable me to follow the career path intended, which was Environmental Consultancy.' (Gedye *et al.* 2004, p 387)

Such evidence suggests that Geography degrees may be failing to fulfil the employment expectations of at least some students, and that there may be a lack of satisfaction in geography graduates' 'career-readiness.' However, it should be noted that the results for career satisfaction of geography graduates in the study by Gedye *et al.* (2004) are similar to those found for all UK graduates. The study by Gedye *et al.* (2004) also suggests that over 90% of students and graduates alike believe that the curriculum should include skills useful to employment. Thus, despite some debates amongst academics on the role of universities in providing such skills, there seems an overwhelming pressure from students that they should be given the opportunity to develop these skills. The EBTS project also shows that students clearly appreciate the opportunity to develop subject-specific, career-relevant skills.

The role of the university has changed in society. Students and government alike, the funders of the university's core activities, believe that it is the responsibility of universities to provide career-ready graduates and to address the employment prospects of their graduates. This can only be achieved satisfactorily through increased communication between higher education, and both private and public sector employers. Such increased communication should be embraced as an opportunity to benefit all parties: the students, through a relevant and informed careers-orientated programme; employers, through a supply of 'career-ready' graduates requiring less initial training; and the higher education practitioners, through increased student recruitment, awareness of current legislative frameworks and increased opportunities for collaborative research. Clearly there are many benefits to be gained by the re-orientation of components of existing 'traditional' skills programmes to focus on career-relevance. This project shows that curriculum developments to address the employability agenda do not have to involve substantial rewriting of course material and that it is worthwhile assessing whether existing material can effectively be re-orientated to address the changing pressures on higher education curricula.

In order to ensure the career relevance of curriculum changes, it is desirable to involve both private and public sector employers. This ensures that projects aiming to provide 'real world' simulations are: realistic and relevant; placed within a current legislative framework; and address the needs of the

employer; therefore providing the students with a greater understanding of work carried out in different employment sectors and the opportunity to develop career-relevant skills. It is notable, however, that in the first running of the project where the introductory legislative framework was presented by the environmental consultant, that no student (other than the student interviewed) referred to this in their reflection on the project. This suggests that the environment in which learning takes place may have a greater effect than the person delivering the material, hence it may be more effective to take students away from their normal 'classroom' environment in order to interface effectively with potential employers.

Conclusion

This project has shown how a simple re-orientation of existing course material in a traditional 'skills and techniques' module in a physical geography degree programme can provide an effective and efficient way of addressing the responsibility of higher education to address the employment prospects of its graduates. The involvement of employers in the design of material and its evaluation ensures the careers-relevance of any curricula developments while also providing additional opportunities and benefits for the students, employers and higher education practitioners alike.

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QAA (2001) Code of Practice for Career Education, Information and Guidance. Available at: www.qaa.ac.uk/academicinfrastructure/code_of_practice/section8/careereducation

Engaging students with sustainability issues

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Abstract

Particularly since the launch of the United Nations Decade of Education for Sustainable Development (DESD) in 2005, sustainability has become a key concept in government policies. The Department for Education and Skill (DfES) and the Learning and Skills Council (LSC), amongst others, are looking to educators to take the lead in integrating these issues in the curriculum. Although a lot of valid research about what sustainable development means and how it should be embedded in education has been published, it still remains unclear how teachers and lecturers should be convinced of the importance of sustainability, and how students could be engaged with an issue that is not necessarily clearly linked to their subject of study or a successful career. Although lecturer and student commitment cannot be separated completely, I focus in this article on the latter since universities and colleges cannot claim to promote sustainability if student engagement is not considered seriously. Over the last four months I have worked with student focus groups at University of Plymouth (UoP) Colleges to find out how students engage with sustainability and what colleges should do to encourage it. As the research is still ongoing it is too early to draw strong conclusions, however clear themes are emerging from the discussions, which are interesting enough to publicise in the hope of starting a debate on student engagement in sustainability.

Introduction

As one of many sustainability champions* at Somerset College, I have been involved with institutional change towards a sustainable college and curriculum and have experienced a significant difference in levels of commitment amongst staff and students. A recent survey amongst UoP staff reveals that about 45% of the participating lecturers considered including elements of sustainable development in their teaching in the coming year. The researchers nonetheless conclude that:

Support from lecturers can by no means be taken for granted. Academics are likely to resist attempts to impose an ESD agenda which does not take their views into account, hence the importance of research which considers the extent to which lecturers feel ESD is a worthwhile and appropriate addition to the HE curriculum (Bissell *et al*, 2006).

These figures might look disappointing to some, but it must be said that there is often confusion about the concept and meaning of sustainable development, as often 'sustainability' is confused with 'eco-friendly'. As recommended in the Earth Charter (2000), the declaration of fundamental principles for building a just, sustainable and peaceful global society, there are four main values that underpin a sustainable future:

Respect and care for the community of life; ecological integrity; social and economic justice and democracy and non-violence and peace. (The Earth Charter initiative, 2000)

Because inclusion and equality are very much a part of University culture and embedded in the curriculum, one could argue that most lecturers are using at least a few of the principles in their teaching without at times being aware of it.

To empower people to take concrete action to resolve the challenges we face (Ikeda, 2003)

To be clear about my own view on Education for Sustainable Development, I would like to use the meaning that the original instigator of the DESD, Daisaku Ikeda (2003), has attributed to it. He has three main goals in mind:

- To learn and deepen awareness of environmental issues and realities
- To reflect on our modes of living, renewing these towards sustainability
- To empower people to take concrete action to resolve the challenges we face (Ikeda, 2003)

Students' voice

As a Graphic Design and New Media lecturer, I was particularly interested in the effectiveness of communication about sustainability. To engage with students it is important to understand what matters to them. Adolescents and young adults have different priorities and different worries from middle-aged lecturers; they tend to fret more about short-term problems and relationships. Moreover, each generation has different cultural baggage. Current students have been brought up with mobile phones, the Internet and 24/7 television. This has influenced the way they communicate and absorb information. My generation - I was born in the sixties - had to rely on books or other printed publications for information. If you were lucky you had a good library in close proximity. Today, students have infinite amounts of information accessible at the click of a 'mouse', but yet it seems more difficult for them to find the information they need.

To get a picture of how ESD is communicated with students across UoP Colleges, I found three colleges prepared to collaborate—Somerset College, University of Plymouth at its Exeter campus and Cornwall College (Camborne). All students are Art & Design students because it is my own subject area, however they could have been from any study subject. The participating students are not necessarily pro-sustainability and mature students were included to get a complete picture.

All students were asked to participate with an on-line survey. The purpose was to find interesting patterns in the answers. The questions were drafted to find out more about general level of engagement, empowerment, future expectations, fears and influences on thinking and behaviour. Because only a small number of students are participating, no hard conclusions can be drawn from the answers, but they did provide me with data that led to discussion topics. For example, I noticed that impact of 'climate change' was more often discussed at home than at college. Why?

Students from all these initiatives suggested that at home triggers for discussion such as the evening news are readily available, while at College such triggers for debate are absent.

It was also mentioned that being at University, a new social environment caused insecurities about the appropriateness to discuss 'political' issues. Since the colleges did not offer the discussion, students did not want to rock the boat.

This point enticed me to discuss in more detail the function of triggers at colleges, and together we drafted a list with *turn-ons* and *turn-offs*. Most students felt strongly that colleges should show in practice that they care about sustainability and that it should not be just theory. For example, they would like to have recycling boxes in their studios and workshops. Although acknowledging that recycling is a last resort, they wanted to be able to make a personal contribution to a more sustainable world. It would also signal that the college is taking environmental issues seriously.

Lack of communication about sustainability was also mentioned as a negative influence. Just like UoP lecturers, most students thought that sustainable means eco-friendly. They would like to see mission statements about sustainability with a clear description of what it means. It was very interesting to find that only one student at Somerset College mentioned the Genesis Project as a positive influence. The Genesis building at Somerset College, opened in 2006, is beautifully designed, is made from a variety of sustainable materials and is powered by renewable energy sources. It functions as an example for the construction industry and as a hub for a range of sustainability themed educational, business and cultural activities in the South West. When asked, the students told me that they were not aware that there was such a unique building on the campus. What happened? Somerset College put posters up around the college, send e-mails round to staff and organised open days... So the students did not read the posters and the staff did not read the e-mails? As Lucretius observed a mere 2000 years ago:

Even in the case of things which are clearly visible, you know that if you do not turn your mind to them, it is as though they had never been there or were far away. (Lucretius, IV 1994)

Not enough minds were turned to this important development at Somerset College. Giving out information is clearly not the same thing as actually engaging people with information or making information sticky as Malcolm Gladwell explains in his bestseller "The Tipping Point":

By tinkering with the presentation of information, we can significantly improve its stickiness. Simply by finding and reaching those few special people who hold so much social power, we can shape the course of social epidemics. (Gladwell, 2000)

The students in the Exeter group mentioned that their lecturers are playing an important role in engaging them with sustainability and are making information about it sticky through their enthusiasm. It stimulates them to investigate the meaning of sustainable development and the relevance to their subject area of product design. At the other colleges where that enthusiasm is less clearly expressed, it is not only leaving students indifferent, but also making engaged students feel insecure.

Another important positive influence on the students in Exeter was that there is a clear element of sustainability within some of the taught modules. Although they would like to see it extended to all modules, they had clearly taken it more

to heart than their fellow students at Somerset College and Cornwall College. Still there were insecurities about the place of sustainability in their professional career as product designers and doubted whether they should put a lot of energy into it whilst they are at college. As one of the students remarked:

at our course sustainability is not linked to success as a student or as a professional. We are already very busy with our set course work, why would we put effort into taking sustainability into account?

Areas of influence

Through various discussions with the students I was able to identify three different groups of students, and three principal areas of influence on student engagement. As a student enters University, he or she is already engaged with sustainability issues, is neutral/receptive, or is indifferent/negative. The student's attitude is consequently challenged or reinforced by three areas of influence: the curriculum, college policies, and social or personal influences (Figure 1).

It is important to understand that we are all very much influenced by our social environment and that young adults are very susceptible to peer pressure. Gladwell argues that contrary to the way we would like to see ourselves, autonomous and inner-directed,

we are actually powerfully influenced by our surroundings, our immediate context, and the personalities of those around us. (Gladwell, 2000)

Engaged students, therefore, have an important role to play in introducing the concept of sustainability into their subject of study. My survey confirmed the influence of peers on the level of commitment to a sustainable lifestyle. The students were more influenced by people in their close social environment, such as parents, housemates and boyfriends than by the news or other media. Figure 2 shows that receptive students are open to positive communication about sustainability and how they become engaged and empowered students. When they are empowered they will be able to influence sceptical students, who will then become receptive to positive communication at university.

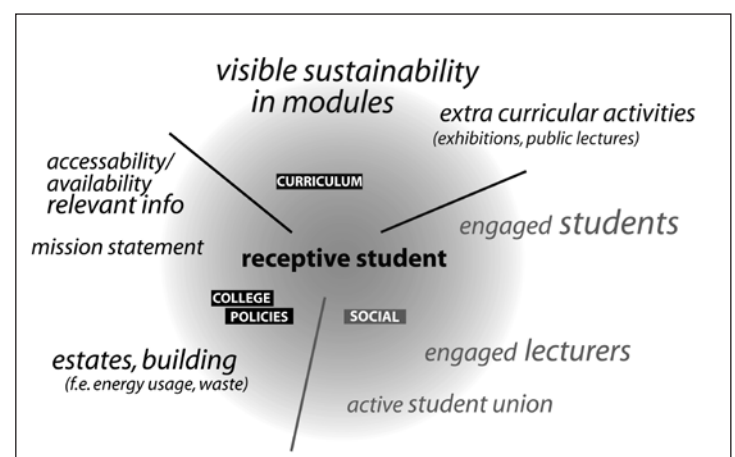


Figure 1

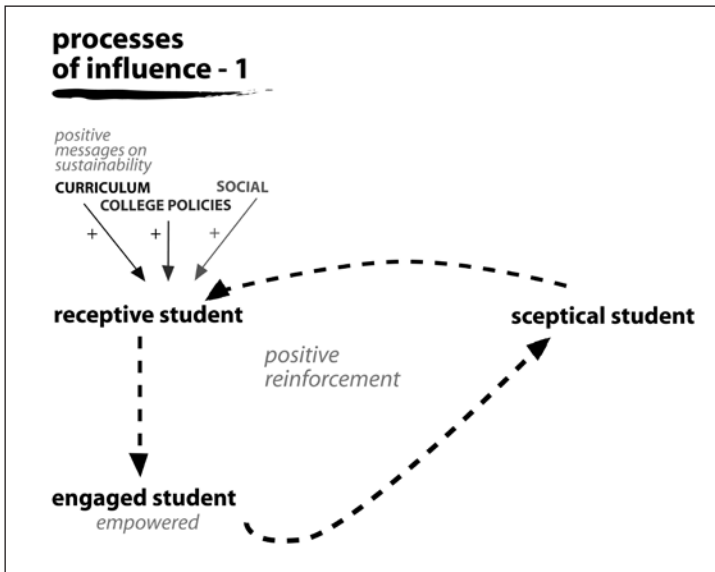


Figure 2

However, if there is negative or lack of positive communication about sustainable development, the engaged student may become isolated and disempowered (Figure 3)

21st Century communication

Since 21st century students access and absorb information so differently, the second phase of my research will focus on how UoP Colleges can help students to make it easier to link sustainable development to their own studies and to approach their subjects in a more holistic way through linking it with other subject areas. Holistic thinking is important to understand the complexity of the global problems we are facing today, as well as a necessity to find solutions. As the deep-ecologist David Orr argues:

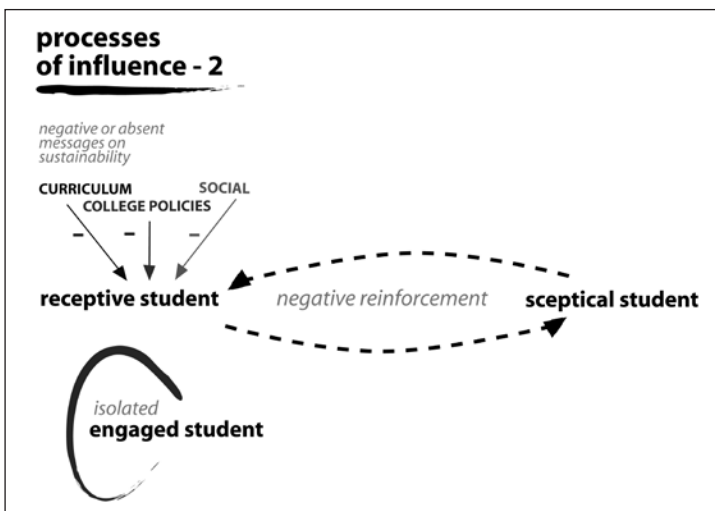


Figure 3

We educate many in-the-box thinkers who perform within their various specialities rather like a dog kept in the yard by an electronic barrier. And there is a connection between knowledge organised in boxes, minds that stay in those boxes, and the inability of those minds to perceive the causes of degraded ecologies and global imbalances (Orr, 1994:7)

Together with the UoP's of Excellence (CETL) in Education for Sustainable Development (ESD) called the Centre for Sustainable Futures and the student focus groups, I am working on an open source website for UoP students, where they can post their ideas related to sustainability; showcase work; find information about local sustainable resources, pod and video casts; and much more. Linking all subject areas together will promote holistic thinking and problem solving. We will also introduce a ranking system to make it easier to navigate through the vast amount of sustainability-related websites that are already on the World Wide Web.

At Somerset college, having learned from what the students in the focus groups have told us, we are now working together to engage students better with sustainable development. At the same time, staff have been involved with strategic planning through participation with 'World Café' sessions in which they had the opportunity to have their voice heard and to exchange ideas with a variety of colleagues from caretakers to governors. It is not a quick fix, but the rocky and exiting journey towards a more sustainable college is on course and I am hoping to share what we learn on the way with all UoP Colleges and more widely.

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*The sustainability champions are self-selected volunteers who are passionate about the development of sustainability at Somerset College. They have received support and training to tackle sustainability issues at grass-roots level

** A process for leading collaborative dialogue and knowledge-sharing, especially in large groups

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Acting sustainably: encouraging and crediting student engagement with sustainable development

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Abstract

This paper reports aspects of the findings of a Small Scale Project funded under the 'Bringing the 'Real world' into the GEES Student Learning Experience' initiative. The project aimed to develop new learning and teaching opportunities for students of GEES related courses within the School of the Environment at the University of Brighton centred on the real world practices of sustainable development. Project activities included the development and undertaking of an audit of modules within the current curricula, focus group meetings with students and the development of a credited 'volunteering' module for students. The paper reports on the findings across all these activities and their value in shaping future developments, within and beyond the curricula and indeed, the GEES disciplines at Brighton. One of the principal outcomes of the project is considered to be the enhanced capacity of staff and students in this area, such that it is hoped that the detail of the project process will be of interest to colleagues beyond the University of Brighton.

Introduction

Finding ways to act more sustainably is very much part of the real world in which all citizens of the globe now live. It is stated as a major policy goal of many of the institutions of contemporary society including Higher Education (HEFCE, 2005) and substantial guidance regarding better practice in this sector has become available in recent years (see, for example, White *et al*, 2004). The GEES disciplines are understood to be a 'natural home' for education for sustainable development (ESD) in terms of curricula and the Subject Centre has been active in establishing resources in this area since its establishment (Chalkley, 2006; Planet, 2002). Addressing the sustainability agenda through the curriculum is argued to be the most important contribution that universities can make, yet is also considered to be the least developed (Martin & Jucker, 2005).

Within the School of the Environment (SOTE) at the University of Brighton (UoB), sustainable development is already a concept that is used to bring the 'real world' into the classroom; in fostering understanding of local-global linkages and of conservation-development tensions within the Geography and Environmental Science programmes and as a powerful imperative behind energy technology developments and impact mitigation systems within the curricula for undergraduate students of the Built Environment and Geology, for example. The GEES Subject Centre Small Scale Project was formulated on an emerging 'informal' recognition within SOTE that whilst many areas of the current curricula engaged with ideas of sustainability, further embedding of sustainable development had the potential to enhance the quality of the student learning experience, particularly within the Geography and Environmental Science programmes. It was considered that after a period of substantial restructuring and of new course development, it was time to consider more formally where, how, and why sustainable development was included within the curricula.

The GEES disciplines are understood to be a 'natural home' for education for sustainable development (ESD)

In addition, the project aimed to develop new opportunities within the curricula focused on the real world practices of sustainable development, to provide students with practical experiences of applied research and reward (through crediting of voluntary activities) their own engagement in local sustainable and community development initiatives. In short, the aim was to enhance the transformative learning opportunities which have been shown elsewhere to be effective means for ESD (Haigh, 2006). In particular, the intention was to work with the UoB's Community University Partnership Programme (CUPP) that had some experience of crediting student voluntary actions within other Faculties of the University, towards developing these opportunities within SOTE.

It was also considered that the project was particularly timely for the University of Brighton community in that it could advance the role of staff and students in engaging with the re-working of the existing Environmental Policy and discussions over the development of a new corporate plan. It was anticipated that the activities of the project could lead to substantial learning on behalf of staff as much as students, an appropriate outcome given that the essential goal of both sustainable development and learning can be considered as:

to help people build personal and social capacity so that they, as learners and social actors, are enabled to grapple with the issues and relate them to their own lives and work, while at the same time appreciating and empathising with the perspectives of other individuals and institutions whose social context and the issues they face may well be quite different. (Scott & Gough 2003: xv).

Project activities.

The development of a working group

A series of initial meetings was held with known interested parties within the School and in the wider University, particularly those with responsibilities in the area of student volunteering and community engagement. This quickly led to a small network of support for the project that included a member of the Centre for Learning and Teaching and the Deputy Vice Chancellor for Academic Affairs. Interviews were also conducted with the Heads of Division within SOTE to identify whether sustainable development was considered to be an important part of the undergraduate programmes for which they were responsible, arch interests relating to ESD.

The curricula audit

An audit of modules currently available within teaching programmes of SOTE was conducted using module specifications held electronically. Module specifications are written by module teams to a university template and guidance and are validated through UoB quality assurance structures. They include identification of aims and learning outcomes, a 150 word account of core content, the learning and teaching and assessment methods and key learning resources associated with the module. In short, a list of key 'ESD' words was developed through discussion within the working group, from which any module making reference to those words would be included in the full audit (see Table 1). Similarly, a number of 'sustainability emphases' shown in Table 2 were identified that would be used to consider these identified modules (although recognising that these emphases were likely to be related and a number could be pursued through a module). It was also considered important to try to differentiate the core 'thrust' of the module in terms of sustainable development literacy as shown in Table 3.

The tool used in the audit was piloted on a sample of modules within the geography area after which minor modifications were made. As a result of the interest in the project generated through the preliminary activities, the audit was extended to include all SOTE modules and the majority of modules within the wider Faculty of Science and Engineering (that includes the Schools of Engineering and of Pharmacy and Biomedical Sciences and the provision at Plumpton, a partner college within the Faculty).

Focus groups

Three focus group sessions with current students of programmes within the SOTE were also facilitated towards the kinds of understanding summarised in Table 4. They were carried out by the Research Assistant to the project who was a recent graduate of the Environmental Sciences programme.

Civil society
Citizenship
Community participation
Corporate social responsibility
Natural resource management
Environmental conservation
Environmental management
Energy conservation
Heritage management
Ecosystem
Governance
Equity
Social justice
Impact assessment
Inequality/poverty
Green/greening
Sustainable/sustainability

Table 1: Key ESD terms

Sustainable/sustainability
Ecological health/functioning (including biodiversity)
Global environmental issues (climate warming/ozone etc)
Delivering human needs currently
Local economic development
International development
Future requirements
Environmental management technique/tool
Social justice/equity (intra-generational concerns)
Social responsibility (on behalf of public or private organisations)
Citizenship (individual responsibilities to local/global people/environments)
Governance (political concerns, stakeholder relationships)
Natural resources

Table 2: Sustainability emphasis

To gain knowledge about...
To acquire a useful skill/technique/tool to apply in real world...
To encourage adoption of a different value/attitude towards future/others...

Table 3: Educational emphasis

Extending credited volunteering opportunities

At the outset of the project, a small workshop was held to introduce students of the Geography and Environmental Sciences programmes to the opportunity to take a module in 'Community and Personal Development' that encompasses approximately 30 hours of voluntary activity with local statutory organisations, business or community groups. This module was currently a core element for students of programmes in Applied Social Sciences (within a different Faculty and on a separate site of the UoB), but had not been available within SOTE. Students were introduced to a number of activities and organisations with an explicitly environmental focus that were known to the module and project leader.

Findings

The audit revealed that there is currently a substantial provision within the Faculty of Science and Engineering in the area of ESD with 21% of modules supplied making some kind of reference to ESD, with the most extensive provision being identified within the Geography Division. Table 5 presents an analysis of the nature of the ESD curricula as revealed through consideration of the key terms used within the module specifications and for the four areas where provision was greatest. The key terms that are common across all areas are highlighted. Whilst 'Impact assessment' was the most common ESD identifier within the Geography and Built Environment area, it did not feature in

Lines of investigation	Underpinning interest
The experience of students of the ESD curricula as currently provided	Differences between staff and student intentions and outcomes? Student expectations of courses being met? Piecemeal or coherent ESD provision? Ideas for improvement
Student values with respect to sustainable development and their source	Role of formal and informal curricula? Knowledge leading to changing values and behaviour?
Student engagement in community and sustainable development beyond their courses	Source of this 'capital'? Understanding barriers to extra-curricular activities Supporting and extending these activities/links

Table 4: The guiding rationale of the focus groups

Geography	Biology	Built Environment	Plumpton
Impact assessment	Ecosystem	Impact assessment	Environmental conservation
Civil society	Environmental management	Energy conservation	Environmental management
Governance	Environmental conservation	Governance	Impact assessment
Natural resource management	Natural resource management	Environmental conservation	Ecosystem
Inequality	Civil society	Civil society	Sustainability
Environmental conservation	Governance	Life cycle analysis	Governance
Sustainability	Citizenship	Natural resource management	Greening
Poverty	Climate change	Citizenship	Natural resource management
Environmental management		Equity	Civil society
Equity		Community participation	Corporate social responsibility
Ecosystem		Environmental management	Biodiversity
Community participation			
Social justice			
Greening			

Table 5: The ESD Curricula: Key reference of modules (by rank order of mentions)

this way within the Biology modules. Whilst the prominence of environmental conservation across the Faculty could have been expected considering the nature of the courses that it hosts, the identification of Governance and Civil Society across all areas was more surprising.

A closer analysis of the nature of the sustainability emphasis within modules revealed that sustainability was found to be most explicit within modules of the Built Environment, whereas across the Faculty, it was techniques for environmental management

that were the dominant emphasis for modules in the ESD area (strongly influenced by the provision at Plumpton) as shown in Table 6. In just considering the primary emphasis of the current curricula (several or more emphases could be pursued within modules and the audit listed these in order of priority), current human needs, international development concerns and intra-generational/social justice concerns were absent (although these did feature particularly within Geography modules in the wider lists).

Sustainability emphasis	Geography (n=19)	Biology (n=13)	Built Environment (n=16)	Plumpton (n= 36)
Sustainability	2		7	2
Ecological health/functioning	3	6		6
Global environmental issues	2		3	4
Local economic development needs				3
Future requirements				1
Environmental management techniques		2	2	16
Social responsibility on behalf of public or private organisations		2		1
Citizenship (individual responsibilities)		2		
Governance (political concerns, stakeholder relationships)	5		4	3
Natural resources	2			

Table 6: Sustainability emphasis: Principal emphasis accommodated within modules

The analysis of the principal educational emphasis of modules (Table 7) revealed that there were potentially two different pedagogical models being promoted through the ESD curricula within the Faculty. For example, in the Biology and Plumpton modules an education *about* the environment (Huckle, 1983) is apparently to the fore, whereas within the Geography curricula, there is a concurrent commitment to extend sustainability literacy towards an education *for* the environment through encouraging value and behavioural change. Within the Built Environment area (and to a lesser extent within the Plumpton provision), there is a more prominent emphasis on the utility and practical application of knowledge.

Core findings from an analysis of the transcripts of the focus groups meetings included that students of programmes within the Faculty had a good understanding of their own developing literacy in sustainability. All students were able to identify areas within the curricula of their courses through which they were gaining knowledge concerning issues of sustainable development (and were widely enjoyed). Not surprisingly, students of different

programmes raised quite different sustainability issues within the discussions. An understanding of the holistic nature of the challenge, their partial knowledge and the varied stakeholders in sustainable development could be identified within some discussions. It was also evident that the discussions themselves were valued contributions to students' further learning. However, a desire to have more opportunities regarding ESD was also evident, particularly for elements of the curricula that made sustainable development relevant to their own lives and locality. There was also some sense that sustainability was currently being experienced in a rather fragmented and partial way within their courses and students themselves could identify opportunities for clearer linkages between modules and pathways to be made within their courses.

An analysis of the focus group discussions also revealed the importance of the learning and teaching approach, as well as the wider learning context for stimulating student interest, understanding and engagement in ESD. Aspects of the former included the 'technical and unemotional' language employed by

	Geography	Biology	Built Environment	Plumpton
To gain knowledge about	42	74	41	76
To acquire useful skill/technique	16	17	32	24
To encourage adoption of a different value/attitude towards others/future	42	9	27	0

Table 7: The ESD thrust

a lecturer in relation to a particular issue under consideration within a module, the ability to choose the focus for essays, and the requirement to make oral presentations as factors that had had a transformative effect on students. Some of the most lengthy and apparently energised discussion across the focus groups also occurred in relation to what was (or was not) happening within the University and the City of Brighton in relation to sustainable development. Learning within the context of lectures and fields of specialism (perceived as discrete) were also identified by students as barriers to their ESD learning and *'that's why it's good to have chats like this, to bring together different disciplines and chat and stuff'*.

There were many elements of the focus group discussions that revealed the significance of 'extra-curricular' ESD learning that occurred for students; through family responsibilities, living with students on different courses, opportunities for socialising with their cohort (particularly on fieldclasses), as well as through engaging with the Student Environmental Group. There was also quite widespread uncertainty concerning University initiatives and how they could become actively involved in sustainable development more widely.

In addition to the evidence of students' developing literacy in sustainability in terms of knowledge, their own impacts currently

as consumers and their future impacts as employees, there was also some evidence of ESD learning leading to overt changes in values and behaviour in the immediate term, particularly in exerting influence over others within the context of part time employment. However, for other students, they were waiting on their graduation and entry to the 'real world' before engaging in actions towards sustainable development. Whilst some students were currently engaging with the Student Environmental Group (several recognising the links with their taught courses and others referring to participation as something that was 'interesting and involved' and 'not just like another piece of coursework'), the focus group discussions also revealed that many students lacked the confidence to 'step out of their course', experienced time constraints and lacked information concerning existing opportunities for environmental action and volunteering, for example.

Fifteen students at Levels 2 and 3 of the Geography or Environmental Sciences and programmes successfully completed the module in 'Community and Personal Development' through the course of the project. The organisations and activities with which they engaged are shown in Table 8.

Course/Level	Voluntary activity
GY L2	Setting up and running a district craft fair in conjunction with an NGO known to student
GY L2	Assisting at St Annes Day Centre for homeless people
ES L3 Four students	Neighborhood Action on Climate Change. Existing UoB and Brighton and Hove (B&H) City Council project. Helping to produce materials for set of adult learning sessions in the community, general team meetings, working with community to establish priorities around local environment/SD
ES L3	Sussex Wildlife Trust at Severn Sisters Country Park
ES L3	Research and actions around development of University of Brighton environmental policies
GY L3	Supporting curricula developments in ESD at local secondary school
ES L3	Brighton and Hove City Council 'Green network' initiative – working with the ecology team and 'parks and green spaces' to review a literature and develop a method for establishing a green network
GY L3	Assistant to Sustainability team at B&H City Council
ES L2	British Trust for Conservation Volunteers; updating member/group registers, event organisation etc
ES L2	Greenpeace, B&H. Reflection on activities she was already doing as coordinator for the group for last 3 years.
GY L2	Schools mentoring at Eastbourne Technology College
GY L2	Pathways to Independence. NGO supporting children separated from parents to lead independent lives

Table 8: Uptake of Community and Personal Development Module from SOTE, 2005-06

Project outcomes

It is considered that the GEES Subject Centre Small Scale Project has been successful in providing enhanced information regarding the ESD curricula within SOTE, and has led to new opportunities within the curricula through the development of the module in Community and Personal Development. There is also evidence that the processes of the project have contributed to significant capacity building and institutional reform that will support further outcomes towards embedding sustainable development in learning and teaching at UoB.

The development and implementation of the audit proved a relatively straight-forward means for eliciting enhanced information regarding the current curricula. This is being taken forward, in the immediate term, by the Geography Division within ongoing programme reviews. Discussions are also now underway considering possibilities for new opportunities for inter-disciplinary collaboration and course development, based on the network of staff (within and beyond the Faculty) with ESD interest generated through the project.

The process of engaging with students within the focus groups provided insights to the student learning experience and to the issues of concern to them that had not come through existing module and course monitoring activities. The fact that students themselves identified that activity as desired and a factor in their own ESD learning suggests that this approach could be part of future monitoring, as well as being incorporated into learning and teaching approaches. The focus groups also very clearly identified the role of the wider learning context in shaping student understanding and engagement in ESD, such that new curricula developments could be linked usefully to initiatives being led in other areas of the University. An outcome in the short term could include finding ways for SOTE staff to support activities being undertaken by the Student Union towards promoting awareness and uptake of recycling or Fair Trade products on campus, for example.

The processes of the project have also led to substantial social learning on behalf of staff involved in the delivery of the Community and Personal Development module; in terms of the collaboration required, the technical and pedagogical learning from each other and in facilitating new community linkages. This module has now been revalidated to provide two further forms with more explicit ESD aims and learning outcomes. Subsequent to this project, additional funds have been obtained through the Higher Education Academy that is encouraging further development and monitoring of supported voluntary action in the arena of sustainable development.

Through the period of the project, the University of Brighton has developed and adopted a new Sustainable Development Policy. There were several points within this process at which 'Having a GEES Subject Centre project' served to empower the project team to engage in that process. As part of the University's new commitment to 'promoting the inclusion of sustainable development within present curricula and methods of teaching and learning', the Assistant Vice Chancellor has circulated a report on this GEES Subject Centre work to all senior staff with the suggestion that it be used to promote discussion of how issues of sustainable development might relate to the courses and students' experiences in the areas of the University under their remit. This report that contains more detail on all the elements of this GEES Subject Centre project can be accessed via the University of Brighton and GEES Subject Centre web-sites.

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The affective domain – report on a workshop at Carleton College

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Most academics are familiar with the cognitive domain through the wide use of Bloom's taxonomy to help set appropriate levels of attainment in higher education programmes. However, the group of college and university examiners that developed the cognitive domain concept commonly associated with Bloom recognised two other domains important for understanding educational goals and how they may be evaluated in student performance: the psychomotor domain and the affective domain. These have received less attention in higher education, mainly because they are less obviously related to knowledge and thinking and few assessment tools have been developed to evaluate them. The handbook for the cognitive domain was published in 1956 (Bloom *et al.* 1956, Bloom 1965) and the affective domain handbook in 1964 (Krathwohl *et al.* 1964, 1973). Table 1 summarises Krathwohl's suggested affective domain taxonomy, which provides a structure that can be used to develop students' personal relationships and value systems. How can learning opportunities be organised so that students get to the "Characterisation by Value" level?

No handbook was published for the psychomotor domain, though others have attempted a taxonomy (e.g. Simpson 1972). The affective domain is beginning to be more comprehensively studied because it involves constructs such as feelings, attitudes, values, beliefs, opinions, interests, and motivation, and it is increasingly apparent that success in the affective domain is associated with success in the cognitive domain. Students who feel good about their study and have positive attitudes are more likely to be successful. The GEES Subject Centre has supported some work in this area (e.g. Boyle *et al.* 2007), but this short article is intended to raise awareness of an affective domain programme of research currently underway in North America under the auspices

of the NSF-funded and NAGT-sponsored *On the Cutting Edge* programme.

The programme commenced with a three day workshop on *Student Motivations and Attitudes: The Role of the Affective Domain in Geoscience Learning* held 11-13 February 2007 and convened by Cathryn Manduca (Carleton College), David McConnell (University of Akron), Thomas Koballa (University of Georgia) and David Mogk (Montana State University). The workshop was part of a series designed to move critical ideas and concepts into the mainstream of geoscience education in North American Universities and Colleges, but I had the pleasure of attending. About two thirds of the 31 attendees were geoscience staff, the other third being either from related disciplines (e.g. physics, biology, mathematics) with an interest in the affective domain or from disciplines such as education and cognitive psychology with a research interest in the affective domain. The workshop was held at Carleton College in Northridge, Minnesota and, despite the freezing conditions outside (highs of -20 °C, see Fig. 1), proved a lively and stimulating experience.

The goals of the workshop were to:

1. Develop a more sophisticated understanding of the specific roles that the affective domain plays in geoscience learning including circumstances where cognitive learning, is helped or hindered.
2. Consider ways in which teaching can address the role of the affective domain and collect examples of current practice
3. Explore the interplay of student values and perceptions in two case studies: teaching evolution and teaching environmental issues.

Level	Definition	Example
Receiving	Student is aware of or attending to something in the environment.	Student would listen to a lecture or presentation about a structural model related to human behaviour. Teacher is the stimulus.
Responding	Students show some new behaviours as a result of their experience. They gain satisfaction from participation.	The student would answer questions about the model or might rewrite lecture notes the next day. The student wants to be involved in activities.
Valuing	Students show some definite involvement or commitment, valuing what they are involved in.	The student has to use judgement to make a choice, and on acceptance of a value, may seek to sway others to their chosen value.
Organisation	Students integrate a new value into their general set of values, attitude or beliefs, giving it some ranking within their overall set of values.	This is the level at which a student begins to make long-range commitments to organising his or her instruction and assessment.
Characterisation by Value	Acting consistently with any new value.	At this highest level, students have internalised and organised values into a system and can now apply these values as a philosophy of life to a broader range of situations

Table 1: Taxonomy of the Affective Domain, adapted from Kraftwohl *et al.* (1964).



Figure 1: Ice sculpture in Northfield, Minnesota, USA.

4. Collect examples of assessments and observation protocols that shed light on the affective domain.
5. Create a network of leaders in geoscience education and cognitive science who can increase the geoscience communities' understanding of the roles of the affective domain in teaching and learning.

The first day started late afternoon with an ice-breaker and a gallery session in which participants recorded responses to three teaching dilemmas with affective domain issues: mineralogy (perceived to be boring; close to my own heart); trilobites (the problem of belief systems contradicting science - how do you know trilobites and humans never co-existed?) and field trips (anxiety, see Boyle *et al.* 2007). After an excellent dinner, Thomas Koballa gave an opening plenary talk on the "Affective Domain and Key Issues" pointing out that affect is not just a simple catalyst, but a necessary condition for learning to occur (<http://serc.carleton.edu/files/NAGTWorkshops/affective/workshop07/koballa.ppt>).

The second day was very full, with more gallery sessions, keynote and panel talks, and break-out small group discussion teams dealing with *Understanding and Improving Student Motivation* in the morning and *Understanding and Improving Student Attitudes*

in the afternoon. One highlight for me was Kelly Rocca's presentation on immediacy in the classroom (<http://serc.carleton.edu/files/NAGTWorkshops/affective/workshop07/rocca.ppt>). This presentation contains many of useful tips for improving the communication of learning material.

The third day took a similar format to day two. In the morning the *Teaching of Controversial Topics* was investigated, with particular regard to the US problem of widespread literal belief in the Bible, coupled with the advance of Intelligent Design as an alternative science. The afternoon session reflected on the previous days to identify themes that could be taken forward as research projects. One theme is the development of a concept map for the affective domain in geosciences (<http://serc.carleton.edu/NAGTWorkshops/affective/workshop07/conceptmap.html>). The other theme is to measure affective outcomes in geoscience classes. About half of the participants agreed to collaborate on a project to assess the affective effects of taking introductory geoscience courses (usually designated 101 in the USA). The project is seeking funding and will generate a set of tools that can be used to measure affective changes and relate these to other metadata (e.g. student performance, student course choices). Day three ended with an excellent Indian dinner at Chapati's restaurant followed by a number of beers at the Contented Cow.

There is an excellent web resource for the workshop and the affective domain in general at <http://serc.carleton.edu/NAGTWorkshops/affective/index.html>. Past and future workshops in the *On the Cutting Edge* series can be seen at <http://serc.carleton.edu/NAGTWorkshops/workshops.html>. If you have the chance, I strongly recommend trying to attend one of these workshops.

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Student Reflection: An ‘ideal world’?

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*“Reflection is a process of reviewing an experience of practice in order to describe, analyse, evaluate and so inform learning about practice.”
(Reid, 1993)*

Introduction and rationale

There is a growing body of research that supports what many tutors have felt is an important way of learning, namely learning by doing. In geography, and other environmentally focused subjects, the role of practical and field work is often cited as a key factor in the undergraduate learning experience, and something that facilitates understanding. However, the link between this ‘doing’ and ‘understanding’, is reflection (Kolb, 1984; Hinett, 2004).

This paper documents an action research project that attempted to introduce formal reflection into the curriculum of a cohort of geography students at the National University of Ireland, Maynooth (NIUM). Tutors at NUIM had identified two major questions about the learning experience that they wished to investigate. The first was to evaluate one method of enhancing the transfer of learning between year two (level two modules) and those in year three (level three modules). At the start of the study, this transfer was deemed to be poor, and was creating issues when students reached higher levels of study, and attempted to construct curriculum vitae for life after university. The second question was the desire to investigate the effectiveness of encouraging student reflection, and to assess the degree to which IT would facilitate this process. The present report provides an overview of the process of reflection and its likely part in the learning process, followed by a description of the project process and an evaluation of its outcomes. Finally, consideration is given to future developments in relation both to encouraging reflection and in the use of IT for this purpose. The modules which form the focus for the project were co-ordinated by one of the authors, while the other acted primarily to evaluate the experience.

What is reflection?

Reflection is a process of reviewing an experience of practice in order to describe, analyse, evaluate and so inform learning about practice.

(Reid, 1993)

While many people, for example Kolb (1984), believe that this process is an in-built part of learning for all people, there is sometimes a lack of awareness of the situation. People do not often deconstruct an experience to explain what happens and so do not always consciously learn at a deep level from the event. This means that when the same situation recurs there is a considerable likelihood that the same experience will be repeated, possibly even endlessly, clearly an undesirable situation. To address this difficulty it is necessary for people firstly to become aware

of the process and then to deconstruct the learning in order to understand what happened (i.e. to learn about it and from it). In other words, reflection needs to go on within the model in order for learning to occur. If the process is successful it draws on both cognitive skills, such as reasoning and knowledge, and also on metacognitive skills, such as intuition and self awareness (Hinett, 2004). As Biggs (1999) noted, this is likely to aid a transformational process, possibly leading to appropriation (i.e. a change in behaviour), as suggested by Boud (1995).

Reflection in geography

Research evidence in general, but particularly within geography, suggests that reflection is of benefit to student learning. For example, McGuinness and Simm (2005) enthuse about the use of reflective diaries to promote the integration of ethical and political concerns into learning. There is also a considerable body of work reporting that students are enthusiastic about the process, for example Thompson *et al.* (2005) and Wright (2005).

The NUIM situation

In year two in NUIM all geography students were required to complete two linked modules which were part of a programme designed to develop skills, generic, subject-specific and those related to research projects. The students were clearly able to learn and to use these skills during the relevant portion of the modules, but, in common with students elsewhere (e.g. Burkill and Corey, 2002) generally failed to transfer their learning to other situations later, even when the tasks clearly required their application. As reported above, it is likely that greater focus on the process of learning will make some improvement in this situation, as students are helped to understand their experiences rather than just focus on the ‘product’. It was, therefore, decided to re-focus the module to encourage the students to work through the learning cycle and, particularly to build reflection into the process.

While Personal Development Planning (PDP) with a component of reflection is an integral part of the higher education system within the UK (and, indeed, students are often encouraged to reflect on their experiences in second level education) no such requirement exists within the Irish education system at present. It was, therefore, necessary to introduce students to the process of reflection at this point in their studies.

Therefore, a reflective component was introduced into a unit in Methods of Geographical Analysis, at NUIM, in which students undertook research in semester 1 related to a real world, community-based problem and then in semester 2, worked in teams to carry out their own small-scale, team-based research projects. Students were asked to set up reflective diaries, online, using a technique known as ‘blogging’, providing both the means of recording reflections and making a contribution to the development of their ICT skills.

Previous experience of asking students to keep journals or diaries while undertaking projects had revealed a considerable degree of ‘retro-fitting’ of entries in many cases, and it was clear that blogs, which are time-stamped would remove this opportunity.

Previous experience amongst the course team had shown that many students felt unable to carry out the process without a great deal of support and guidance, so questions to focus the reflection were to be provided each week. The first question for each session was a practical one – firstly to encourage the student to recall the event to facilitate the consideration of what happened and secondly to provide a relatively easy start to build confidence for the rest of the work: for example, ‘What happened when you carried out your mini survey?’. This question was followed by more thoughtful/experiential ones, such as ‘What did you feel about asking the questions?’ To encourage the completion of the reflection process, more summative questions were included at appropriate times to encourage review of the skills and methods practised: for example ‘How would you compare the trial survey with your experiences of the ‘real world’ one?’

Whilst some tutors felt that some students might have a pragmatic approach to learning, and consider that anything which did not gain marks was not worthwhile, it was felt inappropriate to assess reflective journals formally. Formative assessment involved tutor comments and responses, which could be attached to the blog, and the summative assessment link was provided by the inclusion of a section in the project reports which required students to reflect on their experiences, using excerpts from their blog. Finally, students were required to reflect on the overall process at the end of the year, by undertaking a CV building exercise, which focussed primarily on reviewing the skills that they had used during the year and the contexts in which they had been applied.

Student evaluations of reflection

Almost all of the 180 students participated in the reflection experience. Midway through the year two methods were used to evaluate the experience. A series of focus group interviews were conducted by involving approximately 20 students, who volunteered to participate. All of the students, including the focus group participants, then completed a written exercise, in which they answered four short essay questions. For both of these exercises, students were asked to consider the reflection experience in terms of purpose, preparation, value and drawbacks. As part of the final exercise of the year, students were asked to review their learning and usage of skills and briefly to consider the experience of reflection again.

Mid-year findings

Students’ observations focussed primarily on the following areas:

a) Preparation for the process

Initial responses suggested that students felt basically unsure as to what they were doing, and why.

b) Understanding of the process

This lack of understanding was further demonstrated in their explanations of the purpose for which the reflection had been undertaken. These ranged from ones suggesting that it was understood as providing feedback for the tutors, through ones

which considered it was useful for themselves and on to ones which indicated that they saw the process as about facilitating ‘self-realisation’.

There were also a number of higher order conceptions relating to the reflective process, such as learning from one another, and relating things together by considering actions in a wider context.

c) Motivation for reflection and the benefits obtained

A number of responses tended to confirm the tutor concerns about the pragmatic approach adopted by many students. However, there were at least one third of the people interviewed who summed the process up in a similar way, that this was an ‘ideal world’ we were trying to foster, but ‘it is not an ideal world I am afraid.’

In other words, this was all well and good, but of very limited value and not of any practical use in the ‘real world’, at least when no credit was gained and when time was involved.

d) The method adopted for the process

One major concern that students did identify was with the questions that were set up to try and encourage a degree of reflection. Less than a quarter of the group identified the questions as being helpful, and this was often in terms of giving them a ‘starting point’, rather than directly answering the questions themselves. One group suggested that the questions given at least prompted a degree of reflection, but some felt them a little restrictive and did not allow them enough room to really say what was on their mind.

e) Barriers which restricted reflection

NUIM students identified many pragmatic reasons for not always fully engaging with the reflective writing process, such as IT issues and time pressures. Whilst around ten students of the twenty interviewed identified one or both of these issues as important, there was considerable disagreement about the latter barrier. As many students found it easy to fit into their lives as did not. However, most people suggested that there might be other ways of capturing reflection than blogs.

Comparison of responses from students who identified time as an issue, suggested that other predominant concerns were that they saw little value in the exercise, other than some vague attachment to assessment (and, thus, grades).

Considering whether the blogging itself was a barrier to the reflective process, the group was equally divided. Top of the list of the benefits of blogging was the portability and inability to misplace the writing. However, the accessibility of blogs to all and sundry was cited by one student as a drawback. Similarly, students citing IT issues tended not to view the technique as any better than traditional journal keeping.

End of year findings

As part of the final class of the year, a curriculum vitae building exercise was undertaken. As part of this work, students were presented with a list of basic skills which they had used during the year, for example oral communication, time management and ICT. They then identified as individuals and then in plenary all of the ways in which these had been used as part of their studies. The plenary reports identified a huge range of usage of each skill – a considerably greater range than those suggested by the previous year's cohort. They were also asked about their degree of comfort with the process of reflection – and over 70% reported that they felt comfortable with the process, while only 8% felt uncomfortable.

Discussion

The tutors responded to the findings of the mid-year evaluations by providing a clear explanation of the purpose of reflection. It was also decided to allow students greater freedom in their approach to their reflections. Questions were no longer set each week, but students were provided with a set of generic questions, based on those suggested by Gibbs (1988), such as 'Description (What happened?)' and 'Action Plan (If it happened again, what would you do?)'. It was stressed that these were for guidance, but could be ignored if students felt that their own approach was more appropriate for them. Some did, indeed, use the freer style to great effect. Unfortunately, many more ceased to reflect on a regular basis – suggesting that while the 'enthusiasts' did, indeed, relish a freer approach, the majority view was closer to the small number of interviewees who suggested that the structure was necessary to encourage their reflection.

Overall, the benefits and success of introducing reflection and, in particular, reflective writing into the classroom, seem not to echo through the voices of students interviewed. However, the 'blogs' revealed that the students were actually carrying out the process and that their reflections developed over the period. For example

I have never liked working in groups. I have had too many bad experiences in the past doing groupwork, so I was a little apprehensive about facing more of the same ... this year. It was difficult initially because you have to think quickly with people you have never even met before so I found that all of us were a little shy in the beginning. However...as the project progressed with the deadlines getting ever closer, I found that the group became a better and more efficient unit. I now realise that groupwork is an inevitable part of college life, and indeed life in the workforce so I have come to the conclusion that it is better to get involved and do the work as a team rather than working alone. That way there is a better blend of ideas being thrown around while the work is completed in a shorter space of time.

Ramsden (2003) suggests that clear goals and expectations facilitate a deep approach to learning. Therefore, it seems clear that encouraging more students to be able to identify the need for, and use of, reflection, might enable students to see the process as freeing rather than a restrictive 'must do', due to assessment requirements.

This conception of reflection as something 'other', rather than something central to learning is one that comes across in student feedback again and again, despite the evidence to the contrary provided by the blogs and the other feedback. As a work-based learning student remarked to one of the authors in another educational context, "The problem is, I just can't do reflection. I hate it."

The student then proceeded to have an eloquent ninety minute conversation with the tutor in which s/he reflected at length. What, in fact, this student might be identifying here was that there is a tension about what the process is, and what students think it is. Moreover, it identified a major barrier, which is reflective writing, as the student later conceded that taping her spoken thoughts would be a much easier way of capturing the detail.

Secondly, this experience also highlighted the need for some kind of reflective framework, as the conversation was facilitated by the tutor rather springing very much from the musings of the student. The framework suggested by the project team sprung from early concerns during the design phase of the project regarding how students might respond to questions attempting to provoke an emotional response. Therefore, the questions tended to focus on the process of the class rather than the process of learning *per se*. It was recognised, by both students and the project team, that some of these questions could promote a rather descriptive approach, rather than the analysis of what was happening, which useful reflection should encourage. However, a considerable degree of reflective writing did, in fact, occur and the evidence of this is provided both in the blogs and in the sections of the various reports.

This focus on tactics, rather than learning, perhaps accounts for students seeing the project as one of feedback, as many students suggested that the role of the blog was to tell tutors how they felt things were going with the class, rather than with their own development. Subsequent cohorts will be introduced to the role of reflection within learning, especially with regard to identifying personal development issues in line with considerations about employability. It is hoped that this change in emphasis and regard to the value of reflection might encourage its fuller use.

The pragmatic barriers to reflection are somewhat more difficult to remedy. The IT facilities required are governed by institutional pressures, but it is clear that more training in the use of blogs, so that students feel rather more secure, is one way of clearing up any issues.

As for the issue of time, it is clear that the group is divided as to whether this is really a problem. One suggestion might be that these assessment – as opposed to learning – centred students, use time as an easier excuse for not engaging than discussing the real issue of value. The role of conveying value and expectation rests solely in the hands of the tutors, and it is clear, therefore, that more effort needs to be given to explaining the concept of reflection and its role in learning.

However, one anomaly seems to remain. Whilst the students seem to question the value of what they did, feel unconfident about their ability to reflect, and suggest that there were problems with the process, the interview data shows a rich and thoughtful response to the exercise, in other words some good

quality reflection about what they did. In some students this even transformed itself into suggestions to tutors as to how to improve the experience next year. Furthermore, as evidenced above, they did provide evidence in their blogs and in written reports that they were actually reflecting.

This highlights a dichotomy and a problem. Firstly, students either genuinely feel they cannot reflect, or say they can not do so, when clearly they can. Secondly, they struggle with the mechanism of capturing reflection i.e. writing, when they quite clearly have reflective thoughts about what they do all the time. These students have clearly learned, and so, at some stage, if Kolb is correct, they must have reflected!

This suggests then that if tutors feel that capturing reflection is important they have to work to find ways in which students feel comfortable with this process. Such a method might be time consuming, but this study highlights the problems many students find with using writing as the tool for reflection. At present, those less comfortable with the written method would appear to be somewhat at a disadvantage. This disadvantage would clearly become a much greater concern both for tutors and students if summative assessment was to be directly tied to the written reflections. Further work is, therefore, required on the reasons why this should be the case and the development either of ways to facilitate the writing process or alternative ways to capture reflection (or both).

Conclusion

A group of over 180 second year Geography students at NUIM were introduced to the concept of reflective writing, through the medium of blogging, during a unit which introduced students to methods of geographical research. This was in response to a perceived issue of students not easily recognising developed, developing, or required skills when applying for jobs and writing curriculum vita.

Twenty students were 'focus-grouped' in order to gain feedback about their experiences and all of the class completed a 'short-essay' evaluation in mid-year, followed by a CV exercise at the end of the year. In mid-year they identified issues relating to the practicality of the scheme, but also commented upon issues of expectation and value that need to be addressed in the next cohort. These comments do not seem to support published action research material along similar lines, where student response is broadly positive.

Finally, the students' overall not very positive response to reflection seemed to be in direct contrast with the evidence, which suggested they had both reacted to and reflected upon the experience in such a way that they identified key things they had learned about what they doing in class, and the way in which they were doing it. Also, many seemed more comfortable talking through these reflections in a facilitated discussion, rather than writing these responses down in any way. It is suggested that the need to promote reflection more definitely at an early stage in the learning experience is important, and that either alternative methods or a more supportive approach to written capture are researched.

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Earth Science Teachers' Association (ESTA) Annual Conference 2006

Geoscience in Transition: A one-day workshop for higher education staff involved in school liaison.

Friday, 15 September 2006, University of Bristol

... he suggested that more emphasis should be made on the varied career opportunities afforded to Earth Science graduates

Approximately 20 colleagues from Earth Science departments across the UK attended the higher education workshop at ESTA's annual conference. The aims of the day were to:

- Share experiences amongst those involved in school liaison at various universities;
- Identify common themes and strategies for improving the attractiveness of university geoscience; and
- Discuss issues with practising A-level geology teachers in order to develop a shared understanding of the post-16 landscape.

Presentations were provided from four universities (Leeds, Durham, Bristol and Derby) which outlined their approaches to schools liaison, outreach and student recruitment. In addition, Helen King gave an overview of the GEES Subject Centre's current research on school students' perceptions of geography, earth and environmental sciences (to be launched at the GEES Subject Centre summer conference on 'Recruitment and Retention', 25-26th June 2007, Birmingham and made publicly available via the website at <http://www.gees.ac.uk>). By way of introduction to the day, Phil Murphy from the University of Leeds provided some notes on how better to 'sell' geoscience courses to prospective students. In particular, he suggested that more emphasis should be made on the varied career opportunities afforded to Earth Science graduates and the good starting salaries available from the related industries (e.g. £25k plus package in the oil industry).

The four presentations offered some commonalities of approach and some innovative ideas including:

- Open days
- Attractive websites
- Building relationships with teachers
- Doing something useful for teachers such as providing materials / resources that relate to the GCSE / A level curriculum
- Interaction with schools through postgraduate students or young lecturers
- Help with activities for National Science Week: <http://www.the-ba.net/the-ba/>
- Summer schools
- Placement modules for students involving time spent in schools

- Undergraduate Ambassadors Scheme (UAS): <http://www.uas.ac.uk/>
- Target younger pupils e.g. 8-9 and 14-15 year olds
- Display boards in local museums (for more information on working with your local museum contact the Geology Curator's Group: <http://www.geocurator.org/>)

Following these presentations and discussions, the higher education group joined up with the post-16 teachers to share ideas on how best to work together. These included:

What can post-16 school/college staff do for higher education?

- Invite universities into schools to support specific curriculum areas (e.g. workshops, field trips)
- Pass on information about geosciences to careers teachers

What can higher education do for post-16 education in schools and colleges?

- Provide clear (and enticing!) information on careers;
- Promote teaching geology/physical geography as a good career;
- Posters to display at schools
- Develop stronger links with schools (e.g. write to all local schools asking what can we do for them)
- Recognise geology as an acceptable A-Level for studying other sciences

All in all, the day was extremely worthwhile. The conversations between HE and post-16 teachers were of particular interest as there are not many opportunities for these two groups to meet; I would strongly recommend that future ESTA conferences maintain and enhance these links as far as possible.

Dr Helen King

Assistant Director, GEES Subject Centre

About ESTA

The Earth Science Teachers' Association aims to encourage the teaching of Earth Sciences at all levels, whether as a single subject or as part of a science or geography course. The Association has an annual course and conference which is held at a different university each time at which there are lectures, workshops, discussion groups, and fieldtrips. It also has a quarterly journal which contains articles on teaching methods, updating articles and book, web and CD reviews. The Association has always had strong links with the teaching departments in universities and has always had a few members from Geology and Geography departments. However, the majority of members are from secondary schools. More information about ESTA can be found at <http://www.esta-uk.org>

A summary of the GEES Subject Centre's year 2006-2007

This year, the Centre has seen many new faces, including Elaine Tilson, our new Dissemination Co-ordinator, Sian Evans, our one-year student placement, and four undergraduates on their 80 hour work-based learning module. From July onwards, Yolande Knight (currently our Resource Co-ordinator) will be taking over from Helen King as the Subject Centre Manager, so shortly we will also be welcoming a new Resource Co-ordinator.

New projects this year have included, piloting an Employability Wiki; developing two new departmental workshop themes (Education for Sustainable Development, and Entrepreneurship and Enterprise);

and piloting a new method of supporting departments. This year has also seen the release of six publications, including a Student Focused Publication 'Them & Us?', an Employability Pack, and an Information Pack for Admissions Tutors & Lecturers. In addition to 20 departmental workshops, we have run five national events including: a Mid-career CPD event, a Heads of Earth Science Teaching event, and we are about to hold our GEES Subject Centre Annual Residential Conference. We have also jointly run six events with other groups, organisations and networks within Higher Education, on topics ranging from environmental ethics to virtual fieldtrips.

Coming up in the next 12 months:

Among the themes we will be taking forward in 2007/8 are: supporting staff, employer engagement, assessment/feedback.

* Please note that precise information on the timing of events will be circulated when it is available on the gees JISCmail (to sign up please visit www.jiscmail.ac.uk) and on our website www.gees.ac.uk.

Activities	Details
Planet	Each year we produce two issues of <i>Planet</i> : The 'special' issue is released after the residential conference each year, and contains the papers for each of the conference sessions—the next one being after June 2007 and will be on Recruitment and Retention in the GEES Disciplines. The 'general' issue is normally released six months later, after a call for papers.
Fieldwork Guide	A Guide with information and resources relating to fieldwork will be disseminated early next academic year.
Small-scale projects 2007-2008	The proposals for funding are currently being evaluated and the successful bids will be notified shortly. The results from these projects will be written up in the general edition of <i>Planet</i>
Student Essay Competition	The Higher Education Academy Student Essay competition title will be announced early next calendar year.
Support Staff II	The second Supporting the Supporters workshop, 10 September 2007, will be an event to promote CPD with discipline-specific support staff.
Post Graduate Internationalisation	We will be running an event themed around this topic late 2007. For more information, please see the flyer that accompanies this issue of <i>Planet</i> .
Workshop facilitators CPD	We will be holding a conference for our workshop facilitators in October 2007, for their CPD
Scotland	To enhance our activities, and identify new ways to support and work with Scottish institutions, we will be holding our 2008 residential conference in Scotland on the theme of employer engagement. We will also be holding a pre conference event specifically for staff in Scottish institutions.
New Lecturers' Workshop	For new academic staff and post graduate teaching staff, we will be holding our annual workshop in May 2008.
20 Departmental workshops	As usual, we will be running and facilitating 20 departmental workshops in 2008.
Extended Departmental Workshops	We will be completing and reporting on the success of our pilot extended departmental workshops, and evaluating how this could be facilitated in the future.