

Planet

Supporting learning and teaching in Geography, Earth and Environmental Sciences (GEES)

In this issue:

- Putting learning models into practice
- The pros and cons of peer assessment
- Making the most of team-working
- Local sustainability and LA21
- "Statisticar": driving data collection and analysis
- Writing retreats for academics
- Earth Science courseware goes on the Web
- Mapping the territory at Cheltenham and Gloucester
- Academic Review - a beginners guide
- SusDale – A National Park Simulation
- A Guide to HE acronyms
- Diary Dates



C O N T E N T S

| | |
|--|----|
| Welcome from the chair of the GEES Steering Group | 2 |
| Rita Gardner | |
| Birthday Reflections from GEES | 3 |
| Brian Chalkley | |
| A beginners guide to Academic Review | 4 |
| Brian Chalkley | |
| Feature Articles: | |
| Local Sustainability and LA21 a vertically integrated, research, learning & teaching activity | 5 |
| Peter Hughes, Derek Blair, Hugh Clear-Hill and Chris Halewood | |
| Helping academics to write: experiences and insights from a writers retreat | 7 |
| Sarah Moore and Maura Murphy | |
| The 'statisticar': driving data collection and analysis | 10 |
| Mark Langan, Philip Wheater, Peter Dunleavy and Rod Allman | |
| 'I hear and I forget, I see and I remember, I do and I understand' - putting learning models into practice | 12 |
| Benjamin Horton | |
| Mapping the Territory at Cheltenham and Gloucester | 15 |
| Carolyn Roberts | |
| Theory into practice: Making the most of team working | 17 |
| Martin Pill | |
| UKESCC Earth Science Courseware goes on the WWW | 18 |
| Bill Sowerbutts | |
| But isn't this what you're paid for? (The pros and cons of peer assessment) | 20 |
| Ian Hughes | |
| Subject Centre Activities, Developments and Projects | 24 |
| The PLANET Crossword | 30 |
| Reviews | 31 |
| GEES Guide to...HE acronyms | 33 |
| Have you seen this? | 35 |
| Diary Dates | 43 |
| Questionnaire on the Subject Centre and PLANET | 45 |
| Webbed Foot | 47 |
| Information for Contributors | 50 |

What is PLANET?

PLANET is the bi-annual publication of the LTSN National 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 and present examples and case studies in a "magazine" format.
- 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.

Welcome from the Chair of the GEES Steering Group

Dear Readers,

Over the past 18 months, the disciplines of Geography, Earth and Environmental Sciences, have come together in the most comprehensive national learning and teaching initiative to date – the Learning and Teaching Support Network (LTSN). The National Subject Centre for Geography, Earth and Environmental Sciences (GEES) is one of 24 Subject Centres, all of which have the aim of identifying, promoting and disseminating good learning and teaching practice in Higher Education. GEES has got off to an excellent start, aided by the fact that good practice in learning and teaching in the GEES disciplines is already well established and its importance widely recognised. It is complemented by a strong commitment to students in all three disciplines.

Each of the disciplines is distinctive in its combinations of philosophy, content, methodology and culture. Nonetheless, the three subjects share some important common ground in terms of curriculum, and they have considerable potential to enrich each other in terms of learning and teaching methods. While respecting the different identities and traditions, the Subject Centre is encouraging the three communities to work more closely together wherever appropriate.

Therefore, it gives me pleasure to introduce this, the second issue of PLANET – the learning and teaching publication of the Subject Centre. The first issue received many favourable comments, and I hope you will find this and future editions of PLANET equally informative and useful.

Finally, the Centre is continually looking out for material to include in PLANET. If you have a learning and teaching experience that you would like to share, or if you have a new project or development that you feel deserves a wider audience, then please contact the Subject Centre – they are keen to engage and involve as many members as possible from the Higher Education sector within their three disciplines.

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Profile on... Brian Chalkley

(Subject Centre Director)



What does he do?

Brian is responsible for the Centre's strategic direction and ensuring that its activities and services meet the learning and teaching needs of the three disciplines. This is a 0.5 post which he combines with a continuing 0.5 teaching and research commitment within the Plymouth Geographical Sciences department. He says that these two 0.5s seem to add up to about 1.7 (maths never having been his strong point!).

Background

Brian was brought up in London, obtained his first degree at Leeds and completed his PhD through Southampton. He has extensive teaching experience in various fields of geography and environmental science. He is a member of the Editorial Board of the Journal of Geography in Higher Education, was a TQA Assessor and serves on the Education Committee of the Royal Geographical Society (with The Institute of British Geographers) (RGS-IBG). He is also a member of the learning and teaching group of the Committee of Heads of Environmental Sciences (CHES) and of the Geography Discipline Network (GDN).

Professional Interests

Brian's main teaching/research interests are in key skills, urban policy and the human geography of Australia. He has a particular enthusiasm for field teaching, with Ireland, Hong Kong and Australia among recent fieldcourse destinations.

Personal Interests

Brian is a fan of Glen Miller, Ella Fitzgerald and Brentford Football Club (the first two bringing more pleasure than the third).

Birthday Reflections from GEES

Our Subject Centre team were assembled and began work twelve months ago in June 2000. So, as well as being time for a birthday party, this is a good moment to reflect briefly on the Centre's achievements (and under-achievements!) so far. The Centre's aim is, to help enrich the quality of students' education by providing a range of staff development, staff support and advisory services. What has been achieved in our opening year?

In factual terms, the record of the Centre's main activities is listed in the accompanying inset. It shows that, if nothing else, we have been busy! Delivering the conference and workshop programmes, developing our information gateway, launching our learning and teaching projects, liaising with the Steering Group, conducting the needs analysis, designing the Website, establishing the network of departmental contacts and all the other items listed (and more besides) have kept the team at full stretch. Our reward has been high levels of attendance at our events and lots of favourable evaluations from delegates and colleagues up and down the country. There has generally been a warm welcome for the Centre's subject-based approach.

However, perhaps the most pleasing aspect of the Centre's first year is one which does not actually appear in the table. It is the way in which the three disciplines (not always the closest of allies in the past!) have worked constructively together. A key part of the Centre's mission is to promote collaboration and cross-disciplinary approaches within the GEES communities, and in this we have received full support both from academic colleagues and from the professional bodies.

The first year has not, however, been without its minor frustrations. Perhaps inevitably, quite a lot of time and effort has been invested in establishing systems and procedures, and in building the infrastructure of reporting processes, budgetary arrangements and the like. Nor have we sufficiently raised awareness of the Centre and what it is for. Some people still think we are a branch of the QAA or ILT! We shall need to work harder at establishing our identity and advertising our services.

If our first year has been busy and on the whole successful, the credit should be shared not only around the Subject Centre team in Plymouth but also amongst our Senior Advisors, Steering Group, departmental contacts and all those who have supported and used our services. Thank you all. We have certainly enjoyed our launch year and benefited from your encouragement.

In planning now for year two and the 2001/2 session, consultations are under way as to what our programme should prioritise. With rapid technological change, pressures on fieldwork, changes in sixth form provision, and demands for more vocationally relevant courses, we live in interesting times. So, if you have ideas about which educational issues we should focus on next year, please do let us know. What are the 'hot' issues for you, your department and your students? What kinds of programmes and services do you want from your Subject Centre? Suggestions would be welcome by telephone, fax, e-mail or even perhaps by birthday card! Our contact details are inside PLANET's back cover: we hope to hear from you.

DOWNLOAD Planet TO YOUR DESKTOP

PLANET is also freely available to download as a .pdf file from the Subject Centre's website at <http://www.gees.ac.uk>. The website also provides general Subject Centre information and specific links to other learning and teaching sites. Pay us a visit.

Further copies of Planet are available in a variety of different formats - if you would like any further information please contact the Subject Centre.

Our main year one events:

- Launch conference on Academic Review (London, September 2000)
- Launch conference on Academic Review (Edinburgh, September 2000)
- New Lecturers conference (Birmingham, May 2000 and May 2001)
- C & IT in Fieldwork conference (Leeds, November 2000)
- International Network for Learning and Teaching in Higher Education Geography (INLT) Conference (Plymouth, January 2001)
- Motivating Students workshop (Kingston, February 2001)
- Environmental Science Swap Shop (Kingston, February 2001)
- Conference on Embedding Careers in the Curriculum (London, March 2001)
- Committee of Heads of Environmental Sciences (CHES) annual conference on learning and teaching (Plymouth, April 2001)
- The disabilities and fieldwork conference: in association with the Geography Discipline Network (GDN), (London, May 2001)
- The key skills conference: in association with the Hertfordshire Integrated Learning Project (HILP), (Hatfield, July 2001)

Other activities:

- The establishment of our Steering Group, and of our Employers Panel
- The completion of a Needs Analysis survey of the three academic communities
- The transfer of materials and resources from the CTI Centre at Leicester; <http://www.le.ac.uk/cti/> (The Subject Centre inherited the CTI's role in relation to the use of C & IT in learning and teaching.)
- The establishment of a Subject Centre website <http://www.gees.ac.uk>
- The establishment of departmental contacts in every relevant department in the UK.
- The updating and extension of our good practice database.
- The selection and support of four learning and teaching projects.
- The launch of our programme of 30 departmental workshops
- The production of the Centre's learning and teaching journal, PLANET
- The appointment of Prof. Harold Silver as the Centre's evaluator
- The delivery of several conference presentations to raise the Centre's profile
- The production and submission of our strategic and operational plans and annual review
- The allocation (to Leeds University) and subsequent initial development of the Centre's Information Gateway Project which is known as Tellus, <http://www.tellus.ac.uk>

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LTSN - GEES

A beginners guide to Academic Review

There is currently a lot of interest in the new system of Academic Review but before outlining how it works it is important to make absolutely clear that the GEES Subject Centre is not part of the Quality Assurance Agency (QAA) and is not in the business of assessing the quality of courses or departments. Although our seconded/part-time staff are, of course, free to act as QAA Academic Reviewers as part of their 'other' professional life, the Centre itself has no formal involvement with the day to day operations of Academic Review. None the less, we recognise that the prospect of a QAA visit can focus departments' minds wonderfully on teaching and learning (!) and also that colleagues want to know about the new process of Academic Review which is as yet not widely understood.

As a result, for the great majority of PLANET readers (and especially those who were not able to attend the Centre's conferences on this subject last autumn), we are providing below the following brief guide to the new Academic Review system. This system has already been introduced in Scotland and will operate in all other parts of the UK for our three disciplines (Geography, Earth and Environmental Sciences) between January 2001 and July 2003.

In Scotland all departments are being reviewed. However, following David Blunkett's recent announcement of a sampling procedure for the rest of the UK, it is by no means certain (at the time of print) what proportion and which of our departments will be assessed. None the less, even for providers rated 'excellent' in the last TQA exercise, the possibility of being part of the sample should be enough to ensure a continuing interest in QAA and its new procedures.

The Process

The new process has several features in common with the old Teaching Quality Assessment system (TQA), including the requirement for departments to produce a written self-evaluation. This will include statements about goals and a critical analysis of how far they are being achieved.

The actual review will be undertaken, again as in the present system, by a QAA co-ordinator who will oversee a team of subject specialists. However, rather than visiting the department for the traditional three and a half to four days, the new procedures will involve a series of brief visits (not usually by the full team) spread across several weeks. These visits may be scheduled to target significant events or meetings in the internal cycle of programme management/re-approval/quality assurance.

The precise intensity of the inspection process will depend on QAA's view of the institution as a whole, on the previous TQA subject report covering the same provision and on the new self-evaluation document. In discussions about the new method, QAA began by using the term 'light touch' but this has been replaced by the term 'variable intensity'. The old system averaged 33 reviewer days: QAA is hoping that the new system will average something closer to 25 reviewer days.

During their visits the academic reviewers will attend internal meetings and conduct discussions with staff, students and perhaps employers and external examiners. They may also undertake teaching observations, although this will not be considered necessary where there are in place robust internal systems of peer observation. The reviewers will also use a range of documentary evidence which among other items could include: the self-evaluation, the programme specification, validation documents, internal monitoring reports, student

handbooks, module handbooks, progression data, exam papers, external examiners' reports, employment statistics, samples of students' work, minutes of meetings, student feedback data and equipment/resources lists.

The Judgements

In the light of all the evidence obtained, the reviewers will make judgements on: (a) academic standards and (b) the quality of learning opportunities.

Judgements on standards will fall into three categories which are described as 'confidence', 'limited confidence' and 'no confidence'. Judgements on learning opportunities will be graded as 'commendable', 'approved' or 'failing'. Within the commendable category, reviewers can identify specific features which are considered to represent 'sector-leading best practice'. These will be labelled 'exemplary'.

Judgements on standards will be based on a range of criteria. These will include: the appropriateness of the intended learning outcomes in relation to the national subject benchmark, the effectiveness of the curricular content, the assessment procedures (and their link to learning outcomes) and the standards of student achievement.

Judgements on the quality of learning opportunities will be based on three criteria, each of which will receive a grading. These are the quality of teaching, student progression and pastoral support, and the effective use of learning resources (library, IT, accommodation, equipment etc).

At the end of each individual subject review, a report will be produced and published which will describe the findings of the review team. This will include a one-page summary of the main conclusions. The report will be a public document and will be available on the QAA website.

In addition to this subject-based approach, the QAA will also be operating an assessment process at the institutional level. This will focus on institutional systems for managing quality and standards. In this instance the final judgement will be entirely narrative in style. A report will be produced on each institution about once every six years.

And finally

The above outline of QAA's Academic Review system is no more than a brief summary and for further information you should consult the QAA's website: <http://www.qaa.ac.uk/>

Remember also that although most of the basic procedures are unlikely to change, it is at present uncertain how the recently announced sampling approach will operate. It remains to be seen precisely who will be 'in' or 'out', although we do know that everyone will be required to produce a self-evaluation document. There is no complete escape!

We also know that QAA are still welcoming applications from colleagues who might wish to be employed as Academic Reviewers. Interestingly, the training documents use Geography materials as their case studies.

Finally, whatever your own view of the QAA and its procedures, Academic Review looks certain to be a continuing topic of debate in higher education. As a result, the Subject Centre (without any formal involvement) will watch out for QAA developments, highlight lessons from the Scottish experience and provide an arena for comment and discussion. So, if you have ideas or concerns which you would like to share with colleagues, do let us know.

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LTSN - GEES

Local Sustainability and LA21: a vertically integrated, research, learning & teaching activity

Peter Hughes, Derek Blair, Hugh Clear-Hill and Chris Halewood - University of Sunderland

Part of the core spine of the Environmental Studies degree at the University of Sunderland are integrative 'Environmental Issues' modules at each level. The second semester delivery of these modules brings levels one, two and three students together for a 'local sustainability project' (LSP). The students work in mixed level small research groups looking at various aspects of sustainable development in collaboration with Sunderland City Council's Local Agenda 21 (LA21) personnel, and other local environment and development agencies. After explaining the background to the use of mixed level, or 'vertically integrated' student groups at Sunderland, this paper outlines and evaluates the aims and practice of the LSP in terms of student knowledge, key skills development and 'real-world' focus.

Background

Since it was established as a degree programme in 1974, Environmental Studies at Sunderland has sought ways to facilitate interaction and exchange between first, second and final year students. Up to 1993 this was encouraged in an informal manner; but since then mixed-level task-centred student groups have been an embedded feature of the programme. From 1993/4 to 1998/9 these groups were based around assessed task-oriented workshop sessions that supported and processed a series of guest lecture sessions. Student reaction to these sessions was largely positive, with the opportunity to work with students from other levels being seen as having clear academic and social benefits. However, what in a more traditional learning and teaching environment might have been treated as refreshing, began to seem to both tutors and students as a little routine. The staff team therefore designed a new approach. In part inspired by a vertically-integrated project on the BSc Environment course at Glasgow Caledonian University, it was decided to build a new model based around a student-led, real-world research project.

Aims of the Local Sustainability Project (LSP)

The LSP has three primary groups of aims: knowledge-related, skills-related and real-world orientation.

In terms of knowledge, the project has been designed to provide a framework within which students can take a synthesising and holistic approach to the study of sustainable development policies and issues. While probably all modules on our Environmental Studies programme engage with the sustainable development agenda, it will often be from a relatively specialist position (e.g. international environmental politics, wildlife management, urban policy). There needs to be a point in the core of the programme where students engage with the social, economic and environmental aspects of sustainable development together, and where they can pool in a transdisciplinary fashion the knowledge and perspectives developed in more specialised modules. The LSP was therefore designed to facilitate this approach.

In terms of skills, the LSP provides an opportunity for the development of research, group-working, communication and reflection skills. The LSP is particularly helpful in this area, as it is an experience designed to be repeated in each year of the degree. This iterative approach enables students to appreciate the development of their skills, knowledge and in particular levels of responsibility in relation to the other levels of students with whom they are working with.

The real-world orientation of the project helps students to appreciate the contribution that Environmental Studies can make to society at large. Being exposed to external practitioners (often graduates of the course) offers students insights into what professionals actually do in the environmental and sustainable development sectors – augmenting other vocational and career-oriented parts of the degree. By being enrolled in a research project that will feed into the City's Local Agenda 21 process, students would hopefully feel that their skills and knowledge base is being put to use in the communities and neighbourhoods in which they live and study.

The LSP 2000

In February 2000 student groups were inducted into the process. They were allocated into vertically integrated research groups, and each group was set the academic task of producing a sustainability profile for one of the City of Sunderland's wards. Each group was given the freedom to address this task according to their own research agenda, however all were expected to address the breadth of social, economic and environmental issues that the sustainable development agenda seeks to address. The overall aim was to examine the extent to which local sustainability was embedded throughout the City of Sunderland. The research task was designed in association with the City's Environmental Services Department and LA21 section, with the goal of utilising the outcome of the research in reporting on the LA21 process and the progress that the City was making towards sustainable development. Other groups and agencies, for example the Durham Wildlife Trust, fed into this process through guest lectures and advice.

There was a differentiation of roles and learning outcomes between levels: Level 3 students were directed to take a lead in the project management, Level 2 students in data analysis and shaping data collection strategies, and Level 1 students in field work and basic research. Groups were supported through the process with weekly tutorial sessions.

After a three month semester, split by the Easter break, each student team was required to submit (1) a 5000 word joint report on their particular ward and (2) to present their findings at a public conference attended by City councillors, external partners and invited members of their local communities, using posters and presentations. Each student subsequently had to present (3) an individual diary and reflective critique of their role and output in the exercise. All of the three elements were formally assessed on a 25%/25%/50% ratio.

Feedback and evaluation

When students were asked to identify the key things that they had learned from the project, it was clear that they recognised its value in deepening their understanding of sustainable development and the

LA21 process. The research process itself exposed the grounded nature of sustainable development pressures and responses in the diverse wards of the City, however the conference was particularly helpful in exposing the contested nature of the sustainable development agenda. It was staged from 10.00am to 3.00pm and gave students their first real experience of professionally conducted conferences, with presentations, workshops and lots of discussion with external experts. The fact that the practitioners, the tutors and the students could openly disagree and debate provided for a highly stimulating environment, with some level three students describing it as the best thing they had experienced on the course, and overall student confidence in their research and ideas being boosted considerably.

In terms of skills development, students recognised the teamworking skills that were being developed and appreciated the different levels of skills being expressed by level one, two and three students. However, some found the specific roles and responsibilities given to the levels too restricting. For example a confident, mature level one student might find themselves naturally taking a lead role in the group. In terms of the group process, level three students were concerned that too much of the burden and responsibility was placed on them, and indeed level one and two students perhaps relied on them a little too heavily. Students found it less easy to distinguish the skills of reflection that were being developed through the reflective diaries, although tutors found them invaluable in terms of giving an insight into the learning styles of individuals, and different perspectives on the group dynamics.

One unanticipated negative comment from students related to the notion that they were being used as cheap labour by the City Council. What the tutor team thought was an invaluable opportunity for students to have some real input into the LA21 process, and to receive recognition for their growing expertise in sustainable development issues, was perceived by a significant minority of students as being co-opted into a process that perhaps they were critical of. There was some tension here between providing a valuable learning experience for the students, while at the same time offering external partners something out of the process. External organisations generally want data, whereas the tutor team and the students were perhaps more interested in a strategic and academic overview of local sustainability processes. For example, Durham Wildlife Trust wanted each group to administer a pre-prepared survey addressing public understanding of biodiversity. Many groups rejected this because they found the survey too simplistic. From a learning perspective, that position is defensible and even desirable, but in terms of keeping good relations with external bodies it was more problematic. Ultimately, the students' findings were summarised and given a page in a public document produced by the Environmental Services Department of the City (City of Sunderland, 2000) reporting on progress toward sustainable development. This included some quite critical perspectives, and has proved valuable in the current second phase of the project in helping students to recognise the value of their work.

Review

Overall, the Environmental Studies tutor team found the process a valuable one, although there were undoubtedly some teething issues associated with its delivery in the first year. Students seem a little

more wary of innovation and need some convincing as to the validity and worth of new approaches that may seem burdensome to them.

In preparing the second year of operation, currently being delivered, some structural changes have been made. The roles of the different levels have been made a little more open, with Level 3 students being framed as facilitators rather than managers. Level 3 are also no longer involved in group assessment, and instead produce individual reports that reflect on their facilitating role and also address the substantial academic themes. However, this does mean that the group reports as produced by Level 1 and 2 students will perhaps lack some of the critical perspectives that level three brought, and might therefore be of less value to practitioners. In this instance, the tutor team is clear in its prioritisation of the learning experience over the usefulness of any output for an external audience.

Overall, the project was designed to have real-world relevance, addressing a problem that faced the Local Authority as it grappled with constructing its strategy for sustainable development under Local Agenda 21. Confronting the realities of sustainability in local communities, and augmenting academic theory, proved to be instructive to students. Knowledge of local networks, features and personnel was increased enormously.

However, the team roles and group nature of the exercise produced tensions and stresses in the learning process. Simple refinements and changes have removed most of these concerns. From the tutor perspective, although the project is in some ways difficult to facilitate, it has all sorts of valuable learning outputs, many of which feature heavily in the QAA benchmarking statements for ES3. It provides the sort of learning experience which genuinely allows ES students to use all aspects of their knowledge and skills base in a synthesising way, and as such expresses and reproduces the culture and ethos of Environmental Studies at Sunderland.

For more information on this activity, please feel free to contact any of the authors below.

Reference:

City of Sunderland (2000) *Moving Forward: A Report on Progress*, Environment Department, City of Sunderland, UK.

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Helping academics to write: experiences and insights from a writers retreat

Sarah Moore and Maura Murphy - University of Limerick

This paper describes the initiation of an annual 'writers retreat' at the University of Limerick. The purpose, format and outcomes of this initiative are discussed and explored. In addition, the learning and teaching implications and the link between learning and teaching and research are discussed. The initiative reported in this paper was open to all disciplines at the University of Limerick. However, it would be possible to adopt/adapt this type of exercise for specific disciplines, such as Geography, Earth and Environmental Sciences. Moreover, retreats can be used for all kinds of writing including teaching materials as well as pedagogic and subject-based research.

The initiation of an annual writers' retreat at the University of Limerick

The process of writing is essential to good teaching and good research. Indeed, with increased pressure for research output and developments associated with the rapid growth of emerging educational technologies, the discipline of writing is becoming an even more essential dimension of academic competence. Moreover, retreats can be used for all kinds of writing including teaching materials as well as pedagogic and subject-based research.

The writer's retreat has several aims:

- to create an atmosphere of trust and safety for productive writing;
- to help participants to learn from each other about the processes of writing;
- to create a multidisciplinary community of writers who would provide support and advice to one another both during the writers' retreat and beyond;
- to provide a productive working experience in which each participant would commit to a specific writing goal and try to achieve it.

Structure of the retreat

(1) Participants

Twelve faculty members from a variety of disciplinary backgrounds participated in the first retreat. Places were advertised and filled on a first come, first served basis, and take-up was greatest in the humanities. Participants were advised to do as much pre-work as possible, building a file of resources that they intended to use and planning to arrive at the retreat 'ready' to write up a specific piece of work.

(2) Format

The retreat was a five-day, residential writing 'sanctuary'. The week blended individual writing time with more structured seminars to share writing experiences, and explore aspects of the writing process. A plenary meeting initiated the retreat at the outset, and each participant set up his/her own private 'writing space'.

In addition to quiet writing time, participants also had the option to meet with smaller subgroups to help to edit or comment on drafts of each other's work. Participants gathered at the end of each day for a shared evening meal. Pre- and post-retreat questionnaires were distributed to all group members to get their views about the writing process and about the possible benefits of participating in the writers' retreat.

Perspectives on the writing process

(I) Enjoyable aspects of writing

Participants identified a variety of enjoyable dimensions that they associated with the writing process. Most notably, they referred to:

- the sense of achievement and satisfaction engendered by successful writing;
- the creative, original dimension of writing;
- the durability of their written work;
- the engagement or 'flow' associated with their experience of writing.

(i) Enjoying the sense of achievement

On the sense of achievement associated with writing, one participant summarised the experience by explaining: *'I enjoy developing a theme or idea and following it through. I like developing arguments and suppositions. I particularly like finishing a piece of work and the sense of accomplishment that entails'*. Another talked about how achievement is linked with her own expression of ideas: *'... you've shaped it your way and therefore there's this feeling of achievement'*.

Others referred directly to the feeling of having risen to challenges presented by their writing activities, and to the experiences of accomplishment and satisfaction that they associated directly with the writing process.

(ii) Enjoying the durability of writing

Several respondents referred to the importance of having produced something durable, of 'making their mark' as a result of having written up and published a piece of their work:

'an important part of my job involves thinking, reflecting, exploring and testing ideas....To capture those thoughts and ideas in a coherent piece of writing that others may read, is extremely motivating and enjoyable';

'It's possible to create something that lasts and that others can deal with at their own pace'.

(iii) Enjoying the originality and creativity of writing

On the originality and creativity associated with writing, participants said:

'When something good comes out, you feel like you have given birth or put a little seed, an idea to be developed',

'[I like] the communication of my own ideas, the creative element';

'[I like] creative breakthroughs';

'It's exciting to make interesting discoveries';

'I enjoy the creativity that is engendered by the writing process itself'.

(iv) Enjoying being engaged in creative 'flow'

Being able to become totally engaged in writing was another common theme that participants identified as important. Many comments illustrated this, and some lamented the general lack of uninterrupted space and time for writing in their normal work context:

'I used to adore getting into depth writing. I love getting into a flow of writing, but haven't been able to do this for quite a long time'.

(2) Negative aspects of writing

Participants also identified several negative themes. Most frequently, they referred to problems associated with:

- their own sense of confidence / competence;
- obstacles encountered when starting, maintaining momentum and finishing;
- the sense of external sanction and surveillance associated with academic writing;
- the pressures associated with deadlines either externally or internally imposed;
- the physical discomfort associated with dedicated tracts of writing.

Even very accomplished writers encounter crises of confidence in their efforts to write (Brandt, 1934, Broughton, 1994) and obstacles associated with the writing process are not restricted to novice writers. On problems associated with a sense of confidence and competence, participants said:

'[I] fear ... not being good enough, lacking clarity or producing uninteresting, bland material and not really having anything new or fresh to contribute';

'I lack confidence in the use of academic writing techniques';

'[I dislike] ...not being good at it';

'[I dislike]... the constant referencing of other people's work, worrying about whether you have missed someone important's work'.

Evidence from many university contexts suggests that a lack of confidence may permeate the experience of even the most talented of academics. Any intervention to help individuals to write more productively should address this issue. If not, practical, structured advice on 'how to write' may be a waste of time (Grant and Knowles, 2000).

In addition, the quotations below are illustrative of a strongly held view that the initiation, maintenance and completion of a writing project is often problematic.

'[I encounter difficulties with]... the anticipation, reluctance to get started';

'When I get 'stuck' in the middle and seem to have lost my way or have lost confidence or interest in the material'.

Problems with momentum may at least in part be due to the difficulties associated with finding blocks of time in which to engage in uninterrupted writing. As two other individuals noted:

'[I have problems with the]... fragmented, distracted dynamics that normally prevail';

'It's so hard to overcome all the obstacles (space, time, distractions, fatigue) and it leads to such guilt when articles don't get finished'.

Many of the respondents referred to external sanctions as a problematic, albeit inevitable, part of the writing process:

'The likelihood that these ideas will be justifiably challenged by others.'

Some of the responses indicated that an intrinsic motivation to write is a much more effective driver than external pressure. One individual noted that an aspect of writing that he disliked related to the fact that *'often we are forced to write rather than writing of our own volition'*. Other negative factors invoked were the 'pressure', 'panic', and 'stress' sometimes associated with writing, as well as the physical discomfort associated with dedicated tracts of writing time.

Links between teaching and research

Recent discourse in educational development and improvement highlights the need to link teaching, learning and research more closely together under the overarching university missions of scholarship, critique and creativity. Scholarship is a more important and super-ordinate concept that needs to be applied equally to teaching and research activities. Indeed, it is the concept of scholarship that bridges the false gaps that are often perceived to exist between teaching and research activities, a division that has undermined rather than strengthened the effectiveness with which universities achieve their goals.

In order to understand faculty perceptions more clearly, participants were asked to think about the links between their writing / research activities and their teaching during the week. A question was included in both the pre- and post-retreat questionnaires. Analysis of these responses to this question gave rise to the identification of two common themes reflecting much of what the emerging literature in educational development is starting to recognise:

(1) The circularity and similarities between teaching and research

Participants clearly identified important links, similarities and synergies between teaching and research activities. Comments revealed a perception that not only does research nourish and substantiate teaching but also that teaching can trigger important ideas for research. Several respondents reported having gained important impetus for their research and writing through the essential teaching role that they play. Equally, many referred to the impact that primary research and writing had on their teaching. One respondent summed up many threads of this debate by saying:

'Research and teaching are both part of the same circle, not flip sides of a coin... In a primary sense, I don't differentiate between research and teaching. In order to be an effective teacher one needs to reflect, to read, to digest and to disseminate information in a meaningful way to a discrete audience. The more you research / write / publish, the more you learn and therefore the more you have to impart to others.'

(2) 'Banging your own drum' –the power that original, first-hand research can bring to the classroom

Several respondents mentioned the importance of engaging in original research or writing to strengthen and to energise teaching skills and processes. There seemed a strong conviction among this group that creativity and originality in the writing process can bring distinctiveness to subsequent teaching activities. Specific statements suggested that this was brought about both by higher levels of enthusiasm

communicated by the originator; and higher levels of motivation invoked in the listeners.

Perspectives on the retreat

(1) The sense of community

Insights shared during the week showed that writing in an academic setting can be an isolating experience. People may feel exposed if they admit to any fears or lack of confidence when engaged in writing for publication. This is especially true if there is no facility for providing a sanctuary, where faculty can get help, advice and input on their writing before exposing their work to external critics. Indeed, this is the function of good supervisors and mentors, but one that is often overlooked when it comes to the professional development of university teachers.

Feedback received from participants referred to the value they derived from feeling part of a community of writers while on the retreat. Brodkey (1996) asserts that the experience of writing in a group provides the foundation for feeling integral to a community, even when subsequently writing alone. This is a positive aspect of the experience that several of the participants highlighted both during and after the writers' retreat.

(2) Valuing and focusing on writing in an uninterrupted, self-structured way

Finding uninterrupted time is often necessary if significant progress is to be made in the development of ideas and creative insights (e.g. Deene et al., 1996). It is clear from comments provided by participants, that the writers' retreat allowed for levels of concentration and focus that may otherwise be difficult to achieve.

(3) A focus on health and relaxation

What seemed like trivial luxuries (yoga and massage, which were available at certain times during the week) were highlighted as important components of the retreat. When engaged in the process of writing, a lot of time is spent hunched over computer screens, sometimes at the expense of posture, eyesight, neck and back health. Paying attention to physical health had a positive impact on the writing habits of participants.

(4) Tangible outcomes of writers' retreat

Each participant finished the specific writing project that they had set for themselves at the beginning of the week. Of course, these specific tasks could perhaps have been completed without the help of a writers' retreat, and to attribute their achievement solely to the intervention would be a mistake. What was most significant was the writing speed and confidence that participants reported, as well as the establishment of a community of writers, which they felt would provide a supportive writing context when they returned to the University.

Recommendations

Writing needs to be seen as a creative process. In the drive to produce more academic publications among third level institutions, the implicit motivations of faculty to write is an important starting point. When individuals write out of anxiety rather than desire, the process is driven by a negative and potentially damaging ethic. In the long term, this is

unlikely to help faculty to initiate or maintain productive, successful writing habits.

Universities need to legitimise safe space and time specifically for writing through the initiation of writers' retreats, days or events, and by creating non-threatening mentoring systems among networks of faculty. Once a supportive writing network has been established, such groups should be encouraged and supported in their own efforts to organise creative space for their specific writing projects.

This pilot project suggests strongly that the initiation of writers' retreats may have the potential to impact upon the daily writing habits of university faculty, to unlock positive, formative dimensions of academic communities and to energise the culture of scholarship in research and teaching to which we should subscribe.

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Copies of the full report of the writers' retreat are available from the University of Limerick's Centre for Teaching and Learning by contacting the authors below:

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The 'statisticar': driving data collection and analysis

Mark Langan, Philip Wheeler, Peter Dunleavy and Rod Allman- Manchester Metropolitan University

Statistics is a subject that creates trepidation for a significant number of students in the GEEES disciplines. This article explores the teaching of statistics and associated techniques for data collection to large classes (150 – 200) of first-year students studying for degrees in a variety of specialisms (e.g. human geography, physical geography, GIS, ecology) in the Department of Environmental and Geographical Sciences at the Manchester Metropolitan University. These students have a range of academic and social backgrounds, in terms of the nature and grade of academic qualifications, vocational experiences and age. The challenge of increasing numeracy skills, such as those related to learning basic univariate statistics, is ongoing at all levels of degree programmes. The intention of this article is to provoke discussion around this subject in the light of the changes occurring in higher education.

Background

This is the first time we have run our first-year module in Data Collection and Analysis, although it is developed from a sequence of exercises run previously in the Department. Experience of the former exercises and feedback from current students indicate that we have achieved some success in teaching various learning skills (numerical and IT), using a knowledge base relevant to several subject areas and adopting user-friendly resources. More specifically, students are becoming familiar with statistical 'outputs' and gaining an understanding of the importance of variation in data sets. Arguably most important, students are becoming less 'afraid' of this discipline. A brief look at advice from teachers of 16-18 year olds (e.g. Garbutt, 2001) echoes our findings that approaches should:

- include practical work (i.e. student connection with data points);
- be critical of data sets (i.e. challenge data collection techniques; examine distribution of data);
- stress the multi/interdisciplinary importance of statistics (and make exercises relevant to student interests).

Experience of our undergraduates' preferences and those of employers has led us to avoid a mechanistic approach beginning with probability, and binomial/Poisson distributions etc. Our emphasis has been on training students to design appropriate investigations based on suitable analytical techniques and to interpret/communicate subsequent findings. In addition, it is important that students begin critically to appraise the work of others, including the design, data set and analyses involved. After all, many graduates will not be required to carry out statistical procedures, but will have to use the results in decision making. Therefore, we have taught them in stages as a response to practical work. We have had many (heated) debates concerning the balance between teaching statistics from first principles, as opposed to a tool for research. This debate is not new (e.g. Hawkins *et al.*, 1992) and we have found previous approaches that taught statistics from a traditional standpoint both 'switched students off' (due in part to a perceived

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lack of relevance, despite being integrated into the subject area) and increased the time before students were capable of using statistical skills in allied units.

In our first-year module, students use data collected from laboratory and field studies and learn how to use the software (the procedures are provided in booklet format for future reference). This allows statistical aspects to be introduced gently, for example examining the distributions of their data before attempting to introduce the importance of a normal distribution and the problems associated with meeting its requirements. We refer to, and work through the examples in, a single book for background information to statistics, which was developed in part from teaching in this way (Wheater and Cook, 2000). We provide further references to increase the range of examples available. The unit involves a range of staff (with a diversity of quantitative and qualitative expertise and geographical and environmental backgrounds) and uses large lecture classes, tutorials and workshops to support practical data-collection exercises. A brief description of the format is provided below.

The programme comprises three stages that loosely fall into the compartments of (1) physical geography, (2) environmental science (including ecology) and (3) human geography. It involves 11 members of staff and 4 postgraduate researchers with a variety of research interests. The first stage introduces data types and uses a field visit to consider information collected in different ways e.g. soil types and organic/inorganic matter, grid references, etc. Soil is collected from this area and used for the second stage, where students (working in groups of three or four) plant barley seeds and examine physicochemical characteristics of an upland soil and an organically farmed lowland agricultural soil provided for comparison. This generates data for parametric analyses (*t*-tests, Pearson's correlation and simple linear regression) and is supported by a 'fill in the gaps' workbook. This format includes workshops and assignments linking data collection with the subsequent analyses, to check students' ability to use techniques correctly and interpret the output. This link is strengthened by the production of a final interpretative report. This stage generates an assignment every two weeks after each computer workshop, during which the previous assignments are returned with written and verbal feedback.

The plant-growth experiment links nicely to R. Fisher's original work at Rothamsted throughout the 1920s, where many of the principles of modern univariate statistics were developed to understand the effects of treatments on crop growth. The laboratory component is concluded with group discussions (eight to ten students with two tutors) that strive to examine whether students can produce a synthesis of the work they have completed (e.g. laboratory data, statistical analyses and theory). During the final stage of the unit, each student completes a model questionnaire with one respondent, which is used as an example of qualitative data collection. Class data is used to introduce tests for non-parametric data (Mann-Whitney *U* tests, Spearman's rank correlations and chi-squared). Here the students contrast quantitative and qualitative approaches to data collection and analysis, which is introduced through didactic lectures, discussed in focus groups and examined in written assignments. Practical sessions in all stages (field, laboratory or computer suites) are supported by, at

least, a one hour theory class. For example, these include an outline of the background to the practical exercises or the statistical tests being used that day.

The 'statisticar'

During the delivery of this format, we have found it useful to refer to the analogy of driving a car; hence - the term 'statisticar' as used in this article. Since students are not taught through probability, data distributions etc. at this stage, it is pointed out that they are learning how to drive the statisticar but do not need to know in any detail how the engine (mechanics/electrics) works. The format facilitates correct application/ interpretation of analyses and provides both a working knowledge of the software and information as well as resources for further exploration of the mechanics behind the theory that occurs at higher levels. The statisticar can be viewed in many ways, one of which is shown below with associated concepts in parentheses:

- 'Pre-car check' (experimental design/ surveys/ stating hypotheses/ selecting statistical tests);
- 'Getting going' (describing and summarising data/ using software/ understanding elementary statistical concepts);
- 'Motorway driving' (answering statistical questions/ interpretation);
- 'Reaching destination' (communicating findings).

We appreciate this is just one approach and that there is room for further improvements. Discussions after the laboratory practicals consistently reveal differences in individual learning experiences. Although the majority benefit from the theory-practical (one week), theory-analysis (next week) and feedback (two weeks later) approach, there are those who find it confusing. Suggestions from students who found it difficult to link data collection with the analysis included running one 'complete exercise' on the same day (i.e. go from the laboratory in the morning to the computer workshop in the afternoon). Even disregarding the timetabling implications, this may be saturating for the students who would have to absorb two theory lectures and two practicals (collection and analysis) on the same day.

The potential for diagnostic assessment of numeracy skills on entrance is being considered, with the intention that learning needs are addressed with extra classes. Currently, there is provision of support classes for numeracy both within the Faculty and Department. In addition we provide tutorials on demand by students. However, we still have concerns that some of our students are not appreciating the multidisciplinary potential of the knowledge they are gaining (we do use different examples for their theory and practice, but perhaps we could link better the three stages of the unit). Also, the software-driven approach to the computer workshops can result in students feeling a little 'like an automaton' during classes and they can easily end up working together a little 'too closely'. We are increasing the time and resources for this unit, providing an improving humanistic approach to workshops with postgraduate demonstrators, dedicated 'drop-in' sessions and reviewing resources (e.g. handbooks for software packages). We are also considering interactive models for the variety of discussion forums in the unit (e.g. pyramiding).

Overall, the teaching model presented here facilitates the use of statistics to solve practical problems. The use of data generated by students, avoidance of initial mechanistic theory and opportunities for students to discuss the work (tutorials/seminars) prevent them from 'switching off'. We are developing the strands throughout their degree programmes to ensure students acquire knowledge of the statistical engine as appropriate to individual needs. Second-year students attend residential field courses and so far, with experience of the previous exercises from which the present unit has been developed, they have managed to work increasingly autonomously (with the appropriate resources) on group projects that incorporate statistical analyses.

This suggests that many first-year students are developing levels of confidence and competence in their numerical skills on which they build successfully in later stages of the course.

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'I hear and I forget, I see and I remember, I do and I understand' - putting learning models into practice

Benjamin Horton - University of Durham

Learning is a natural human process and numerous models have been put forward to explain this process, or the ways that people acquire skills. These models can be categorised into two main schools of thought; behaviourist and cognitive. The aim of this study was to apply a combined 'wanting, needing, doing, feedback and digesting' model of learning to evaluate a new first year undergraduate module taught in the Department of Geography at the University of Durham. The study illustrates five basic elements to learning and presents evidence to show how problems associated with the learning experience may be improved.

Introduction

The behaviourist school of learning believes that learning happens through stimulus, response and reward. The stimulus is the input and the learned behaviours are the outputs (Race and Brown, 1998). Behaviourists also consider repeated practice and the use of rewards to help appropriate responses to be important (Skinner, 1954).

On the other hand, the cognitive school of thought focuses on perception, memory, concept formation and the ability of people to demonstrate their understanding of what they have learned by solving problems (Race and Brown, 1998). This school has made use of clinical, experimental and survey-type research to develop many theories such as the learning cycle (Kolb, 1983).

The two schools of thought referred to above formed the basis of the 'wanting, needing, doing, feedback and digesting' model of learning (Race and Brown, 1998).

Learning cycles

Race and Brown (1998) devised four questions to study how learning actually happens. From the analysis of thousands of answers, they identified five principal factors underpinning successful learning:

- i. *Wanting to learn*: requires motivation, interest and enthusiasm. It can be catered for by a variety of resources. For example, effective face-to-face lecturing which generates enthusiasm, carefully worded learning objectives in flexible learning packages or by the stimulation provided by attractive colours and graphics in computer-based learning packages;
- ii. *Needing to learn*: a substitute for motivation. This requires circumstances such as necessity, survival or saving face;
- iii. *Doing*: learning is by doing through practice, trial and error;
- iv. *Digestion*: making sense of what has been learned, thereby gaining ownership;
- v. *Feedback*: is provided by a variety of means such as feedback from tutors and trainers, or by responses to exercises.

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Race and Brown (1998) used these five factors to develop their model of learning. (Figure 1). This simple model ('Ripples on a pond') can be thought of as a series of nested learning factors. At the core is *wanting/ needing*, which in turn leads to *doing*. Surrounding these factors is *digesting* whereby learners make sense of their learning experience. This is aided by *feedback* on the whole experience and on what has been achieved. The main benefit of this model is that it removes the need to think about learning as a unidirectional sequence as the stages may be explored in any order; for example, feedback on something may create a wanting (Race and Brown, 1998).

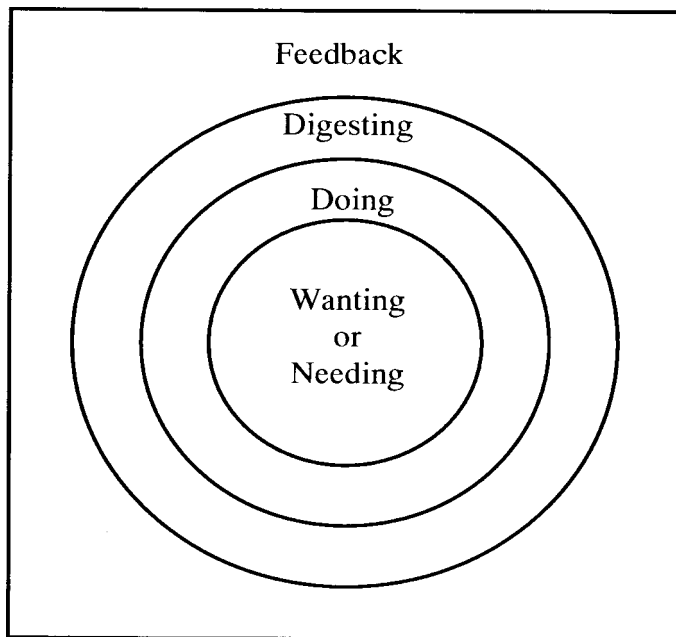


Figure 1. Ripples on a pond (modified from Race and Brown, 1998).

Discussion and reflection on the evidence

Geographical Knowledge is a first year Geography module taught by various members of staff from the Durham Department of Geography, to approximately 130 first year undergraduate students. The aim of the module is to enable students to learn and practise basic skills of observation, manipulation, application and presentation of geographical information, through group, field and laboratory work. These are interwoven through the module, which draws on methods learned in other modules and deals with data relevant to the Human and Physical Geography modules.

The module runs for a full year and has a variety of teaching methods. There are nine lectures which are attended by the whole year. The year is then split into three sub-pleraries. They each have a seminar series and an end of module conference (where project results are presented) associated with a one-week residential fieldtrip in northwest Lancashire. The final teaching method is a self-paced learning package.

I have a variety of roles within this module including: a key lecturer in the seminar series and associated residential fieldtrip; assessment and feedback of self-paced learning packages, overseeing fieldwork reports and seminar presentations from the end of module conference; and the subsequent revision of the module following evaluation from fellow members of staff and students.

Results of the module evaluation show that it was moderately rated overall. Indeed, the fieldtrip itself received a very satisfactory return with many students stating that it was the best feature of the module.

The success of this can be interpreted in terms of five learning elements, identified earlier as underpinning effective teaching:

- i. *Wanting to learn*: Although the module was only moderately received by students (see later for further discussion) the seminar series and associated residential fieldtrip were certainly delivered with interest and enthusiasm.

Our overall aim was to make the students realise that the learning experience starts from the first seminar. We tried to make the students *want to learn* by emphasising what a great opportunity they had and this infected the students and prompted many interesting open discussions and debates regarding their forthcoming fieldtrip. The students, whilst working in their tutorial groups, had to develop their own physical and human geography projects under our guidance and, therefore, the students took immediate ownership of the projects. To aid the students we provided a resource centre, which included relevant literature, maps, data archives etc. The students gave presentations on the projects with students and staff peer assessing. The associated fieldtrip to northwest Lancashire provided a major incentive for the module. Students collected their own primary data during the fieldtrip and this provided continued motivation for the subsequent analysis and write-up;

- ii. *Needing to learn*: This module had a wide range of subject areas, teaching methods and assessment techniques. Therefore, we realised that there were some aspects where it would be difficult to generate in students a strong *wanting to learn*. To compensate, during the seminar series we tried to explain to the students why they really *do need to learn*. In addition, during first year tutorial classes we consistently gave them strong positive encouragement and stressed the importance of this module for developing their skills and enabling them to be successful at the University and beyond;
- iii. *Doing*: This module had a major project element (50% of summative assessment). The combination of a block of lectures (providing the background and theoretical basis) followed by seminars and the associated residential fieldtrip enabled students to explore ideas and concepts directly in a practical context. This learning by doing continued throughout the second term as students continued to work on their projects. By the end of term two each group had to write a research proposal and fill in a risk assessment form for their human and physical geography projects. The proposals included a summary of research, location for fieldwork, methodology for data collection, equipment requirements and comments on proposed analysis. We had to approve the proposal forms and sign the risk assessments before the students could undertake their fieldwork.

The project work culminated in an end of module conference where students presented group reports to the seminar class and fieldtrip leaders. The latter assessed the group reports and seminar presentations. Further learning by doing was provided by a series of

assessment projects, which were set during the module. These were based upon lecture material and supported by tutorial classes;

- iv. *Digestion*: The bulk of the background and conceptual material of this module was delivered in term one. Therefore the students had ample time to reflect and digest whilst attending the seminars and 'token supervision meetings' (see below) in term two and during the week long fieldtrip. Construction of the research proposals and group reports forced students to digest material and present it to others;
- v. *Feedback*: Feedback was a very important part of the *Geographical Knowledge module* particularly during the seminar series and fieldtrip. The seminar series enabled students to have immediate and available feedback on design and implementation of fieldwork.

In addition, feedback was provided during "token supervision" meetings. Each project group was allowed two 20-minute meetings with a member of staff. This meant staff time was safeguarded and students reflected and digested their results before approaching staff. The aim of the seminar series and the 'token supervision' meeting was to promote deep, active and reflective learning, and provide constructive feedback regarding the research design of their human and physical geography projects, the end of which was the submission of a research proposal. Students worked on their physical and human geography projects during the week-long fieldtrip and staff mainly acted as advisors although they were readily available to give constructive feedback. Finally, fellow students, lecturing staff and external 'guests' provided feedback at the end of the module conference.

Summary

The *Geographical Knowledge* module, especially the seminar series, associated residential fieldtrip and end of module conference, paid attention to all stages in the learning cycle. However, the lecture series, formative assessment, and the summative self-paced report had serious problems and this affected the *wanting* side of the module. Students commented on the inadequate coherence of progression, poor clarity of teaching, limited library support, poor communication between staff and students, excessive time demands of the assignments and the poor feedback from formative coursework. These influences are reflected in the summaries of module questionnaires. To address these problems during the academic year meetings were held between teaching staff and students. An immediate outcome was the development of an email list of all staff and students, which was used every Monday during term time. These emails include information on all aspects of the module including, lecture schedule, fieldwork and assessments.

At the end of the academic year, teaching staff from the module held a meeting to digest feedback from students and fellow members of staff. Topics discussed included summary of module content, tutors reports, student comments, feedback from demonstrators, formative assessment (amount and feedback) and summative assessment. We subsequently revised the module by returning to the 'wanting, needing, doing, feedback and digesting' model of learning. To improve the module structure and sense of progression there will in future be a clearer separation of terms one and two, with more lectures in term one but

more time for the summative projects and the computer test, both now due in term two. There will also be an introductory or lecture and one less seminar. The formative projects will be shortened and feedback will be timelier with the emphasis on enhanced learning. Although the Durham module has overall received a somewhat mixed response from students, we believe the changes to be made will deal with the difficulties which have arisen in some parts of the modules delivery. Above all, we believe that there is real value in applying the Race and Brown learning model both to help design learning experiences and evaluate their success.

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Mapping the Territory at Cheltenham and Gloucester

Carolyn Roberts - Cheltenham and Gloucester College of Higher Education

This article describes a joined-up organisational change that has taken place at Cheltenham and Gloucester College of HE in providing degree programmes in the GEES disciplines. The change has resulted in reducing the number of modules taught across the degree programmes, which in turn has enabled more staff to spend more time on research and consultancy (including pedagogic research). It is hoped that the article will be of interest to a wide range of academics in the three GEES disciplines at other institutions.

The first edition of PLANET contained an interesting analysis by Mike McGibbon on the University of Greenwich's approach to teaching across the separate disciplines embraced by the National Subject Centre for Geography, Earth and Environmental Sciences. The evolution of the approach over the late 1990s was influenced by employment opportunities, increasingly complex and multidisciplinary research questions, and aspects of the curriculum which were agreed as common. He highlighted the synergies which could be achieved from crossdisciplinary tuition, emphasising shared areas of knowledge, and capitalising on the diversity in approaches to teaching and learning. This was also the perspective shared by the Quality Assurance Agency's (QAA's) Benchmarking Panel for Earth

Science, Environmental Science and Environmental Studies, which mapped out the potentially shared curriculum area across these disciplines and identified common traits, before trying to capture typical approaches for the three broad groups. Interestingly, the geographers had previously decided not to pursue this approach in their own Benchmarking Statement, preferring to concentrate on typifying the Single Honours degree, but the Subject Centre's approach also reflects shared perspectives.

All knowledge forms a continuum in multiple dimensions, and the locations of individual disciplines and areas of enquiry can be characterised in relation to one another. The spectrum from Earth Science, (with its emphasis on understanding the operation of chemical, physical and biological systems), through to Environmental Science (where the emphasis is increasingly on shorter timescales, the impact of human beings, and the potential role of management), towards Environmental Studies, (with a predominantly human-led agenda, simply expresses this in one dimension). Geography, with its very catholic approach, covers similar academic ground, drawing it together with a human-environmental link and a distinctive spatial approach.

At Cheltenham and Gloucester College of Higher Education, course developments of the last three years have drawn heavily on such disciplinary mapping, embracing tuition in the areas of Town and Country Planning and the Built Environment, and Design disciplines such as Landscape Architecture as well as the environmental sciences and geography. Figure 1 shows the range of degree courses which are currently offered within the School of Environment, and indicates their relative placing in terms of the curriculum. Subjects such as

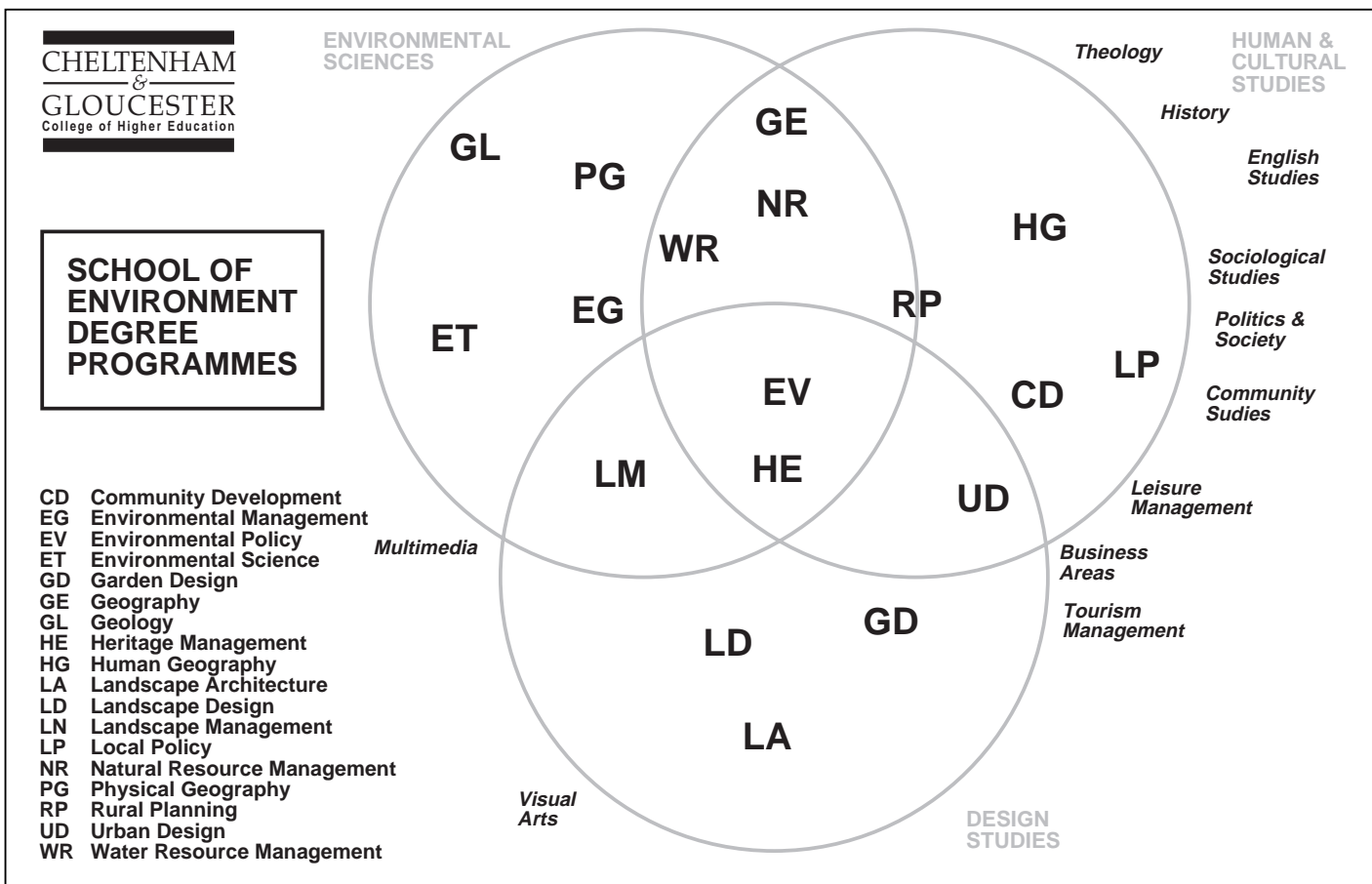


Figure 1. Range and placement of the degree courses offered at Cheltenham & Gloucester

Geology, taught at Cheltenham since the late nineteenth century, occupy space broadly within the environmental sciences set. Human Geography is viewed as one of several human and cultural studies, whereas Landscape Architecture falls primarily in the design group, but overlaps into terrain occupied also by Landscape Management, with its focus on applied ecology, and heritage. Many degree courses are interdisciplinary or multidisciplinary; for example, Water Resource Management draws on understanding of the sciences and analytical tools of hydrology, geology and ecology, but also necessitates a grasp of the management of human systems, environmental economics and policy studies, placing it in an area of overlap on the diagram. Similarly, the focus of Urban Design is similarly placed within the space where human and cultural studies overlap with the design disciplines. Degrees such as Environmental Policy and Heritage Management reflect a multidisciplinary approach, and draw heavily on shared teaching and perspectives. In total there are eighteen degree courses, which reflect the wealth and diversity of career opportunities now developing across environmental domains, broadly cast. Almost all the programmes are available in combination as Joint Honours, enabling students to tailor their intended outcomes still further as they progress through the three levels of tuition.

The bulk of the development of suite of degrees was undertaken in 1998-9, followed by the addition of three HND programmes in 2000. Although it is difficult, and indeed undesirable, for any Department completely to ignore the history of previous teaching in its course developments, the development team began its thinking without preconceptions about the titles of different modules which would ultimately make up the programmes. The key elements in the design process were to define and locate the aims of each degree course carefully to ensure distinctiveness, and to agree the range of territory which each would embrace. Staff expertise, market research and available academic resources informed the placing, and the award titles finally offered. The intended range of some courses was wide, for example Geography, whereas some were narrower, for example Community Development with its sharp focus on policy and engagement with local groups of people and their interaction with social, governmental and physical environments. Individual modules were located on the same mental maps, one for each level of study, and each degree programme drew on a range of modules, utilising them as compulsory, core or optional elements as appropriate. Module learning outcomes were thus located firmly within the envelope of the overall aims of individual programmes. Students from different courses would study appropriate material together - planning law, concepts of heritage, or geochemistry, for example - and gain interdisciplinary understanding as a result. In comparison with the previous arrangements, where eleven degree programmes required some 165 modules to deliver them, the number of modules was reduced to 125.

Certain design principles were sacrosanct, reflecting the overall academic objectives of the development. Each course, for example, had to embrace part of the central territory on the diagram, where issues concerned with sustainable development, fieldwork skills and familiarity with vocational imperatives were located and delivered. This approach was subsequently validated by their emphasis in each

of the relevant Benchmark Statements so far published, and appears likely also to be reflected in forthcoming ones dealing with Town and Country Planning, and Agriculture-related subjects. Each course was required to demonstrate that it had developed, to varying extents, a balance of appropriate knowledge and understanding, key transferable skills, personal qualities and understanding of the world of work. Managerially, the efficiencies secured through joint teaching have enabled more time to be released for research and consultancy (including pedagogic research) which better informs the curriculum, and have improved the flexibility of response to changing student markets at undergraduate level. A higher level of common teaching, particularly at Level 1, has released resources to invest in smaller groups at higher levels.

Success of any course development can be evaluated in different ways. Certainly the new offerings have proved popular with potential students, as applications and registrations in the School have increased by 20-25% each of the two years since it was introduced, in the face of declining national numbers in this area. It has also increased the diversity of the student population, the more vocational qualifications particularly attracting mature entrants. Fewer students have withdrawn for reasons associated with having initially chosen the wrong course, as their flexibility to shift the balance of study has increased. The increasing availability of modules through distance learning has assisted the take up by students across the UK (two complete degrees are available to distant learners, and others are available in part). The Programme Specifications used in the development have also formed the basis of one of the QAA's national models, and the overall development has been the subject of interest by other departments faced with similar situations of declining applications, increasing resource pressures and need to render the offered curriculum more flexible. The RAE outcomes of the staff teams involved in teaching will be seen only in a few months time, but overall the School is confident of its approach meeting many of the demands of the next couple of decades at least.

While recognising that the organisational circumstances facing degree course designers vary substantially between institutions, it is hoped that the picture of Cheltenham and Gloucester outlined above will be of interest to a wide-range of UK academics in the GEES disciplines. If anyone requires further information, then please do get in touch.

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Putting Theory into Practice: Making the most of Team Working

Martin Pill - University of the West of England

Team work assignments are a popular way of developing skills in the GEEES disciplines. The objective of this paper is to describe an example of a teamwork activity which captures the benefits of team working and enhances the development of students' key skills in Environmental Sciences department at the University of the West of England.

Introduction

The Report of the National Committee of Inquiry into Higher Education stressed the importance of key skills in Higher Education programmes. The report stated that "employers want graduates to have a wide range of skills, such as those personal and cognitive capabilities that people use to carry out a wide range of tasks and activities" (Dearing, 1997). In particular, the Dearing Report highlighted the key skills of communication, numeracy, C&IT and learning how to learn. The report stated that "...in the long term there is considerable advantage in embedding skills into programmes". Since then, references to key skills have become widespread, for example: "given the requirement for producing well rounded graduates, the emphasis on skills cannot be overstated." (Thomas, 2000). Indeed, references to key skills are particularly pronounced in the Subject benchmarks produced a by the Quality Assurance Agency (QAA).

The context for this paper is a level 1 module of up to 70 students which has a teamwork assignment worth 20% of the module marks. The exercise is set in the second week of term. The students work in teams of 4 and have to undertake an audit of one of their houses to determine the water and energy used and waste produced during the course of a week. They must devise suitable methodologies to enable them to collect the data they need (e.g. how do you measure the volume of water used when the toilet flushes or the electricity used by the cooker during the week?).

The students submit a report that explains and justifies the choice of their data gathering methodologies and also presents the data using appropriate tables/graphs. They then discuss their results, comparing them with national data they have found, and make suggestions as to how resource usage may be reduced in the future.

So, with the starting point of an interesting and challenging assignment, what can be done to help the students produce an excellent written report and build in added value by way of developing their team-working skills?

Method

The first step is to expand the scope of what will contribute to the overall assessment, beyond just the main report. So, the students are asked to submit in addition:

- An abstract of the main report;
- A contribution statement (which describes the contribution individual members have made to the final report);
- Team rules (agreed and signed by all members);

- Meeting agendas (from at least 4 meetings);
- Meeting minutes (from at least 4 meetings);
- Reflective comment from each team member (using separate guidance sheet).

This immediately shows the students that there is more to a successful assignment than the final report, as all the elements listed above contribute to the assignment. The abstract and main report together determine the mark allocated. The other elements form an appendix, and as they are specified in the assignment, they must be present for the work to pass. As team working is an important part of this assignment it was decided not to allocate a specific percentage mark for these elements (the alternative approach). Otherwise, it would be possible for a team to completely omit the appendix and still achieve a good pass. The second step is to then provide the assistance the students need in order to accomplish what is being asked of them. This is done by:

- 1) Explaining to the students the rationale behind the assignment, including the benefits of team working, and introducing them to the idea of the experiential learning cycle (Kolb, 1984). Many students seem surprised to be given the opportunity to think about their learning, and to understand why they are being given a particular piece of work to do.
- 2) Making use of the excellent "Learning in Teams: A Student Guide" book (Gibbs, 1998) which is loaned to each student for the duration of the project, and used as the basis for some class exercises. The book is inexpensive enough to be bought in bulk and loaned to each student for the duration of the project.
- 3) Before being put into groups, the students are asked to think about their own experiences of team working to date, with the aid of a handout which prompts them with a variety of questions. They are then put into groups and sent off for coffee to exchange names and addresses and discuss their teamwork experiences and aspirations.



"Team-work and a steady hand are important in this exercise!"

- 4) Undertaking a group-forming activity during the initial briefing session. Helping the students through the initial group-forming process is important, particularly as they are only in their second week at University and are unlikely to be comfortable working with strangers in a new environment.

- 5) Giving guidance and support reading on skills such as report writing, how to hold successful meetings and write proper agendas and minutes.

An extract from the briefing sheet for this opening 'ice-breaking' activity is shown below.

Several open containers of radioactive liquid have been found standing outside "A" block.

The containers, which closely resemble polystyrene cups, must be transported, without spillage, to the allocated safety zone outside the Science Faculty, a distance of a few metres.

Your team has been allocated one container and your mission is to move your allocated container to the safety zone as quickly as possible. You must minimise radiation exposure to your team during the transport phase, for example by maintaining maximum separation between the container and any part of your team member's bodies.

At your disposal, you have :

- A quantity of string
- 3 sticks, each 30 cm long
- 3 Swan Vesta matches



Create a Radioactive Material Transporter from just the equipment you have, and complete your mission!

Incorporating skills development within modules and exercises rather than as stand-alone packages was favoured by Dearing, and this approach works well in this instance. The students can relate what they are learning directly to the project they are working on. They also appreciate being given the wider context, so they can look forward to deploying these skills in other situations, and ultimately the world of work. Each student receives three one-hour support sessions over the course of the term. These are delivered to groups of 15-20 students in normal class time.

Evaluation

Evaluation of this approach has been undertaken by looking at the outputs and studying the students' reflective comments. The reports produced are generally good, with very professional-looking minutes and agendas. The minutes and agendas together with the contribution statement provide documentary evidence of the role each student has played in the project and can help identify any students who have not contributed adequately. If complaints are made about one member of the team for not making a sufficient contribution, then this assertion can be supported by the minutes and agendas. Staff can then make a judgement to reduce the students' mark by a fair percentage.

Student views

The reflective comments show that the students enjoy the assignment:

- "I enjoyed the project a great deal and feel I have learnt much about teamwork and the amount of waste produced in the house"
- "I enjoyed working with my group in a social and professional manner"
- "I found this project to be both stimulating and really challenging"

Their observations about themselves also show that they have learnt from the experience:

- "I would make sure I keep more up to date with what the other members are doing so my contribution would be more integrated"
- "I found the project very useful regarding my inter-personal skills and in understanding my shortcomings"
- "Next time I will be more assertive in the meetings"
- "We should have been more firm about setting deadlines"

Future development

There are a number of ways in which this assignment could be further developed and improved. For example, incorporating a more formal mechanism to deal with situations where not all team members contribute adequately to the team. Asking the students to assess each other's contribution as suggested in Gibbs (1995) would be one solution to this. In addition, using online discussion software to allow the students to communicate asynchronously with each other and staff. This would particularly benefit part-time students, but also help full-timers and give the module leader more insight into the progress of each group.

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UKESCC Earth Science Courseware goes on the WWW

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During the last six years, courseware developed by the UK Earth Science Courseware Consortium (UKESCC) has been distributed in application style format to institutions and individuals in over 40 different countries (Bryon and Sowerbutts, 1996; Edwards et al. 1996; Sowerbutts and Bryon, 1996; Sowerbutts, 1998a, 1998b). The last of the scheduled 21 Earth Science courseware modules was completed in 1999. Since that time, further development of the software has focused on providing easier access to the large amount of material available. This has been achieved by adding a front-page with entry points to all the modules, and by adding indexes. The latest development, designed both to aid access and to help tutors integrate this resource into their teaching, has been the conversion

of the original stand-alone application style version into a web version. This article outlines these recent commercial developments, describes how the courseware content extends into subject areas beyond the confines of geology, and outlines the range of educational levels of its users.

Introduction

Additions to the UKESCC courseware at the start of year 2000 included a single front-page and indexes. Both features are designed primarily for use when all 21 modules are available and were introduced to allow easier access to specific pages of material, and to specific terms and topics.

The indexes are used in a similar way to a book index and enable users to quickly find and access specific topics. Two types of index are provided; subject indexes for individual modules and a global index to all the modules. Both are accessible from all areas of the modules.

The subject indexes have been compiled from menu entries, page titles and by manually scanning all the material for terms, and topics not otherwise covered. The global index has been produced by merging subject index entries for all the modules, sorting them alphabetically, and then storing them under separate letters of the alphabet.

The global index makes only minor reference to individual courseware modules and allows the courseware content to be accessed and used in a completely different way to that originally envisaged. Originally, it was anticipated that users would only wish to work steadily through the material in individual modules. While they can still do this, the global index provides the means to quickly find, then jump to, very specific terms and topics, often buried deep within individual modules. In this respect it makes the suite of modules appear like a giant geological encyclopaedia.

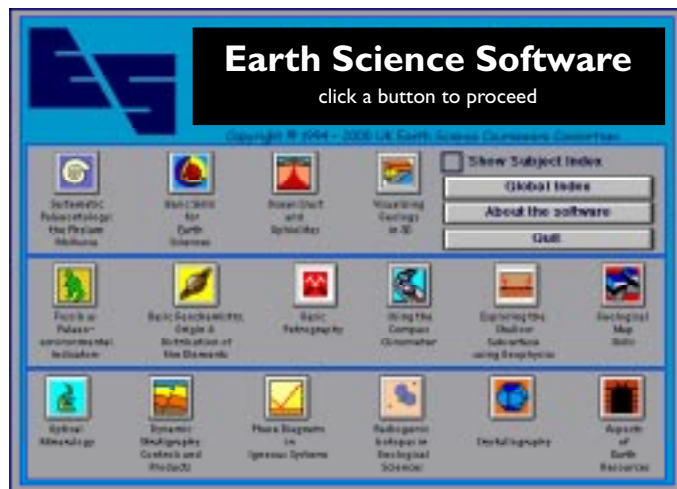


Figure 1. Front page providing access to the 21 modules, their indexes, and to a global index.

Web Version

The UKESCC courseware was developed using Authorware; an authoring software application ideally suited to the production of multimedia style computer assisted learning (CAL) packages. Most of the UKESCC courseware was developed at the time when the Internet was in its infancy, and the only type of output from Authorware was a stand-alone application-style format. It is only comparatively recently that Authorware has been extended to generate output that will run over the web, in addition to the stand-alone format.

A demonstration version of the courseware is available without restriction on the web at www.man.ac.uk/~ukescc/demo.html. The complete version is available to licensed users, and can either be accessed from the UKESCC web server or mounted on a user's web server. All versions require the Authorware Web Player plug-in to be installed where it can be accessed by your browser. The plug-in is available free from the Authorware web site.

One reason for providing the courseware in web form is so that tutors can include in HTML documents they produce for their students hypertext links to specific pages of the courseware. Where the aim is to start at the beginning of a courseware module, hypertext links between an HTML document and the web version of a module are made in a conventional way. Making hypertext links to take the user directly to specific topics or subjects located a particular page of a module, is slightly more complicated.

Indexes provide users with a facility to jump directly to a specific page of a module. This is achieved using variables (that form part of each index entry), and passing them from one Authorware file to another. The current version of Authorware does not have built-in facilities for accepting variables passed from HTML coded web material. A work-around has been devised to do this, and while it works satisfactorily, links from a HTML document can be made in only a limited number of ways.

Usage

The UKESCC courseware is being used well beyond its original brief; which was geology students at undergraduate level. About a third of the modules are widely used in schools and colleges where geology is studied at pre-university level. The courseware is also being used increasingly by interested amateurs, and people attending continuing education courses.

Parts of the courseware are used by students studying subjects like Geography, Environmental Sciences, Physics, Chemistry and Civil Engineering. Reviews of some of the courseware are available (Barclay, 1966; Browning, 1996), as well as evaluations (Sowerbutts and Bryon, 1996; Boyle *et al.* 1997).

Discussion

The UKESCC courseware has been converted to web format mainly for the benefit of users in educational institutes. The courseware is therefore now available in two formats; web and application format. The application format, normally supplied to users on CD-ROM, does not rely on internet access and is popular with students working at home.

Content in several modules is beginning to become out-of-date, although this is not yet a serious problem. This is because much of the content is basic geological information which changes little with time, rather than the results of current research. Also, some of the early UKESCC modules are starting to show their age, with the layout, buttons, etc. starting to look old-fashioned. It is hoped the next upgrade of the courseware will address these issues.

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But isn't this what you're paid for? The pros and cons of peer and self assessment

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The rise in student numbers and other factors such as the limited availability of staff time have put pressures on the assessment process. The adoption of alternative approaches to assessment can help staff respond to these pressures and may also give added value for the student. This article presents an account of the application and evaluation of peer and self-marking in three different assessment scenarios: practical write-ups, communication skills and long essays. The research was carried out with students on Pharmacology courses; at the University of Leeds however, the same principles could easily be adopted in similar scenarios in other disciplines such as Geography, Earth and Environmental Sciences courses. The data presented demonstrate that for practical write-ups and communication skills exercises the approach can be valid when compared to marking by academic staff. Furthermore, peer marking can result in an increase in learning as well as savings in staff time.

Peer marking of practical write-ups.

This evaluation of peer assessment involved two cohorts of students. The cohorts were large classes (>100 students) of first years from two consecutive years. The teaching sessions used were a series of four practicals that involved students following a laboratory practical schedule; and collecting, processing and interpreting experimental data. Following the practical session, the students were required to write up the practical to a set format. Academic staff marked the first cohort, a process that took about twelve to fifteen hours per practical class. The following year the peer-marking cohort marked the write-ups in four one-hour sessions.

Many students believe assessment is the job of the teacher; that peer assessment is hard work and that some student markers are unfair (the title of this article is a quote from a student who had just completed a peer marking session). Nevertheless, peer marking has several educational advantages that need to be explained to students if a peer marking process is to be introduced without resentment (Figure 1) (Fry 1990). The students in the second cohort were prepared for the peer marking process in a preliminary session. Attendance at the session was 'encouraged' by penalising the mark of anyone who failed to attend.

For the peer marking session itself, the class was assembled in a lecture theatre and the practical write-ups were distributed at random. Again, attendance at the session was 'encouraged' by halving the mark of anyone who failed to attend. The marking schedule was distributed and a member of academic staff went through the schedule systematically explaining each point. The schedule was explicit and included instruction/explanation of each point. A small part of a typical marking schedule is shown in Figure 2. The students were required to assign marks appropriately, total the marks and sign to accept responsibility for the accuracy of the marking. The students were also told that a sample of the write-ups would be check-marked by staff. Anyone who felt they had been marked unfairly could have their write-up re-marked by a member of academic staff. However, less than 2% chose to do so.



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P L A N E T

On one occasion the same practical write-up was peer marked independently by three students to investigate whether the peer marking process would produce consistent marks. The final marks given by each student differed by less than 2% demonstrating that the results were reliable.

Student Guide to peer Assessment of Practicals

Why are we doing this?

You should get several things out of this method of assessment which may be new to you:

1. It is an open marking system; therefore you can see what was required and how to improve your work.
2. You see mistakes others make and therefore can avoid them; you also see the standard achieved by others and can set your own work in the spectrum of marks.
3. You get a full explanation of the practical and how you should have processed the data and done the discussion. Therefore your information and understanding is improved.
4. You get practice in assessing others and their work. You will need this skill quite early in a career and you will need to come to terms with the problem of bias; someone who is a good friend may have done poor work; it can be disturbing to have to give them a poor mark.
5. In assessing others you should acquire the ability to stand back from your own work and assess that as well. This is an essential ability in a scientist; an unbiased and objective assessment of the standards you have achieved in your own work. Once you are away from the teacher/pupil relationship (i.e. leave University) you will be the person who decides if a piece of work is good enough to be considered as finished and passed on to your boss.

The method of marking adopted in this course is designed with the above factors in mind.

Figure 1. Part of a document used in preparing students for peer marking explaining the benefits to them.

The numbers in parentheses are the marks available. You may award all or part of the available marks depending on how completely the point has been covered. For each point write the mark given and draw a circle round it on the write-up next to the item assessed. At the end add up the marks (don't forget presentation) and write the total mark and your name (legibly) in a circle at the top of the first page.

Up to (20) marks are available for presentation; assess neatness, clarity, legibility etc as you go through.

1. Is it dated. All work should be. (1)
2. Is it named. (1)
3. It should have a *title* (1) and a heading of *introduction*. (1)
[points 4 and 5 omitted]
6. Is there a graph of response/concentration of carbachol?
 - a) it should be titled (2) CARBACHOL CONCENTRATION / RESPONSE RELATIONSHIP (or equivalent).

b) y axis should be labelled RESPONSE (2) with units (e.g. mm; cm; inches; anything will do [even squares] but the unit must be stated) (5)

c) x axis should be labelled CONC CARBACHOL (2) with units in moles/l (M). NOT DOSE. UNITS should be correctly abbreviated (m; m/l; little m and big L are NOT correct abbreviations). Units in moles/ml (never abbreviate moles to m) are just acceptable but you are strongly advised NOT to use this presentation as it causes confusion (8).

d) correctly calculated? volume (0.1 ml) of solution of concentration $5 \times 10^{-6} \text{M}$ gives amount of 5×10^{-10} moles. This is added to a volume (ml) of 20 ml therefore 5×10^{-10} moles in 20 ml therefore $2.5 \times 10^{-8} \text{M}$. NO partial marks - MUST get this completely right (20).

[rest of schedule omitted]

Figure 2. Example of part of a marking schedule used in a peer marking session. The schedule provides an explanation, followed by the marks available for this part of the write-up.

Peer marking improved student marks

The two cohorts obtained similar marks for the first practical write-up, suggesting that they were of similar ability, but for the following write-ups the cohort using the peer marking process obtained consistently better marks (Figure 3). A sample of peer marked write-ups from the third practical check marked by academic staff gave a mean mark that did not differ significantly from that awarded in the peer marking process. This indicates that peer marking continued to maintain standards compatible with that of staff marking (Figure 3).

It appears that the students who were in the peer assessment cohort were learning how to improve their practical write-ups through participating in the peer assessment process. The following year the 'experiment' was repeated with the first practical being self-marked and the following three being peer marked. Again, the self-marked/peer-marked cohort obtained consistently better marks in the second, third and fourth practicals (data not shown).

Peer Marking vs Staff Marking for Four Practical Write-ups

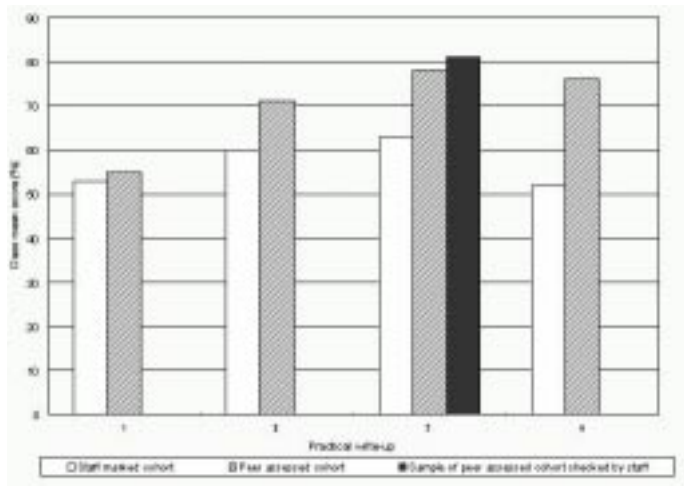


Figure 3. The introduction of peer marking increased the class mean mark over a series of four practicals. The columns show the class mean mark for each of four successive practical write-ups marked by academic staff (open; first cohort) or through the peer marking process (solid; second cohort). The black column shows the data for a sample of the peer marked write-ups which were checked marked by academic staff.

P L A N E T

Peer marking of verbal communications skills

In the final year, students give short talks on the topic of their project which are assessed for presentation by several academic staff who sit through every talk. When peer marking was introduced the advantages were explained to the students earlier in the year and the class developed an agreed marking schedule. This consisted of 10-15 items characterising good presentation (e.g. audibility, varied expression, suitable body language etc.) each graded out of 5 or 10. Both academic staff and students used this marking schedule and the comparative results show a good correlation (Figure 4). The students were slightly harder markers than academic staff. The high correspondence between staff and students in the assignment of presenters to the top or bottom quartiles of the class was highly comparable (Table 1).

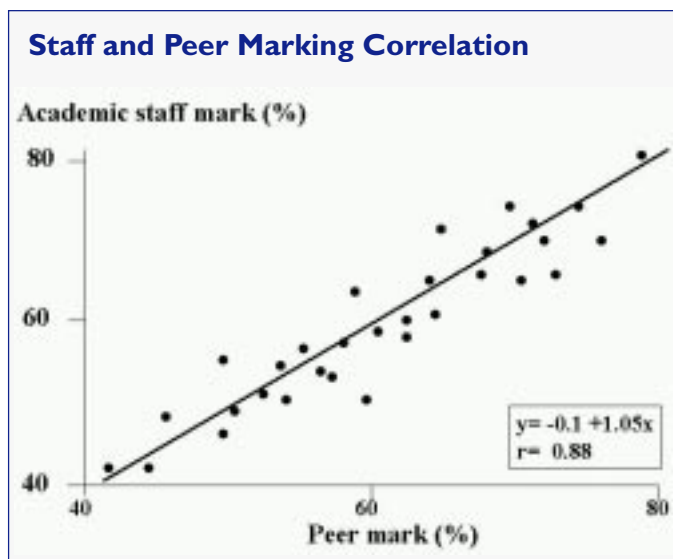


Figure 4. Relationship between marks given by academic staff and by peer markers for presentations skills in verbal communication.

Self marking of long essays

Long (3000 word) essays written by 250 students were marked by academic staff and then self marked by the student author using a set of general criteria (e.g. adequately referenced, well introduced, papers critically assessed etc.). The resulting data is shown in Figure 5. Clearly in individual cases there are major differences between the academic and the self mark and the distribution of marks shows little tendency to correspond to the ideal line. Therefore, the evidence for the validity of this kind of marking is poor. The major difference between this situation and that of the practical write-up is that the latter case used a detailed and explicit marking schedule which was not available for the essay as each was on a different title. While there may be formative value in the self-marking of long essays, the process as used here does not provide evidence of its validity as a summative assessment. The students were generally not able to produce reliable assessment scores on their own essays.

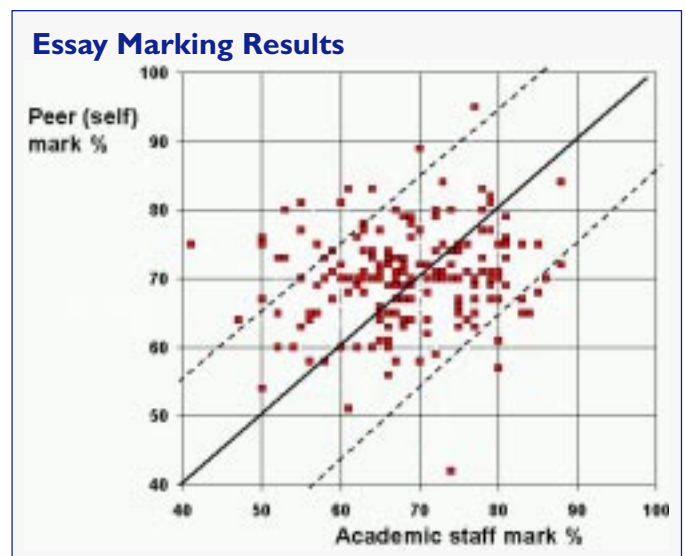


Figure 5. Scatter graph of the mark awarded by academic staff and that awarded by peer (self) marking of a long essay. The solid line represents ideal fit and the broken lines are positioned $\pm 15\%$ from this line.

| | Marking method | |
|---------------------------|----------------|----------------|
| | Staff marked | Peer marked |
| Class mean mark | 63.2 \pm 7.8 | 60.2 \pm 6.1 |
| Top quartile mean mark | 77.2 \pm 4.8 | 74.1 \pm 5.6 |
| Bottom quartile mean mark | 48.2 \pm 7.8 | 44.1 \pm 3.9 |

Table 1. Comparative marks (m \pm s.e.) awarded by academic staff and by peer markers for verbal communication skills for a sample of 44 student presentations. The correspondence between the academic staff and peer markers to the top and bottom quartiles of the class is also shown.

Conclusion

The peer assessment of practical reports (and to a lesser extent verbal presentations) can be successfully undertaken with the aid of a written marking schedule. This provides a standard of assessment similar to that employed by academic staff and results in a large saving of staff time. Moreover, in the practicals, the introduction of peer marking was accompanied by an increase in the standards achieved by the students. Peer marking may have other educational advantages for the students beyond improving performance (Fry 1990, Figure 1) but this is harder to assess quantitatively. The use of peer assessment in the way outlined above will have applicability in other disciplines and may increase the efficiency of learning and assessment and release academic staff time.

Note

The data from the first two examples has been presented in more detail in other papers (Hughes and Large, 1993a; Hughes and Large, 1993b; Hughes, 1995).

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