

# LTSN BIOSCIENCE

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The Learning and Teaching Support Network (LTSN) Centre for Bioscience is one of 24 Subject Centres, funded by the four UK higher education funding bodies, to promote and support high quality learning, teaching and assessment in UK higher education.

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## 2004 – A YEAR OF PROGRESSION

WELCOME TO THE NEW look *Bulletin* and all good wishes for 2004. We at the LTSN Centre for Bioscience expect 2004 to be a year of progression. 2003, our third year of existence, was in some ways a year of consolidation, in which many of our activities have started to yield results and in which we feel we have become increasingly useful as a resource to our community. The "brand" of LTSN across the country (or actually countries) is now well established. In 2004 we will become incorporated into the Academy and there will inevitably be some change in the "branding", and we will be feeling our way and in some respects finding a new role. The Centres for Excellence in Teaching and Learning will also start to come into being and it will be interesting to see how they work and how they will interact with the LTSN.

The LTSN Centre for Bioscience has, over the last month, run its own internal review of its activities. The aim has been to evaluate and prioritise our activities and use the resources that we have to best advantage. This will mean that some activities will change and some may even be dropped — details will appear later — but we have put a lot of effort into some things with rather little gain or appreciation by the community. In contrast, some of our activities, especially those that involve face to face contact with our constituents, have been very fruitful and highly appreciated. The LTSN Centre for Bioscience recently held a well-attended, one-day event at the University of Manchester in which project work was discussed. The stimulus for this event was the Special Interest Group on Final Year projects led by Richard Cowie. Bioscience is a practical subject, and the training of future, employable bioscientists should include some practical experience in the laboratory or in the

field. The QAA Benchmark statements for both Bioscience and Agriculture, forestry, agricultural sciences, food sciences and consumer sciences, state this and also recommend very strongly that the training should include some real experience of bioscience research in the form of a research project. It perhaps gives an indication of how strongly people feel about Final Year Projects that not only was the meeting well attended but also that participants were prepared to come to Manchester from as far afield as Ulster, Dundee and Plymouth. Such events give people the opportunity to discuss topics, meet others with similar issues and concerns and form networks across the community — one of our major aims.

The range of our activities is illustrated by the contents of this issue of the *Bulletin*. As well as the usual selection of articles on learning and teaching projects we have the second in our series from our country consultants, in this case Brian Rushton from Northern Ireland, a report from an LTSN Bioscience departmental visit, comments on our events and potted highlights about what is on our website. We also note that the end of 2003 also saw the "publication" of the second volume of our web journal, the BEE-j (please have a look at this on our website if you have not already done so, and consider publishing). We are proud to be able to offer this totally free, peer-reviewed publication to all. It is interesting that on 2 January 2004 the *THES* carried an excellent article on open access journals by Geoff Watts, entitled "Crusaders for a truly free flow of ideas", in which he rehearses the issues involved in this worldwide endeavour to free up publication for all.

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## 2 | TEACHING AND LEARNING ISSUES IN NORTHERN IRELAND

**N**ORTHERN IRELAND IS A very small constituency when it comes to the teaching of biosciences at higher education level; there are only two major players, Queen's University, Belfast (QUB) and the University of Ulster (UU). The Open University has a presence in Northern Ireland (indeed Belfast is the centre of its activities for Ireland as a whole) but most of the staff tutoring biology courses would be loosely associated with one of the other two universities. Additionally, there are two university colleges of QUB that provide largely teaching qualifications and there are a number of franchised courses with a biological component. Funding is routed through the Department for Employment and Learning, Northern Ireland, though in many ways, for example the Subject and Institutional Review processes, Northern Ireland is treated as an off-shore English island.

### THE STUDENT POPULATION: IMPORT AND EXPORT

The student population at QUB and UU is probably very different from that in many HEIs 'across the water'. Statistics (<http://www.delni.gov.uk/docs/select/HE%20Compendium%202003.pdf>) indicate that nearly 92 per cent of all students attending university in Northern Ireland come from Northern Ireland (equivalent data for the other regions are: England 86 per cent, Scotland 75 per cent and Wales per cent). There is a significant

export of students to the rest of the UK – 31 per cent of Northern Ireland students choose to study away from Northern Ireland (compared with 5 per cent of English students studying outside their region, 7 per cent of Scottish students and 39 per cent of Welsh students). This amounts to about 12,000 students a year. Whilst there are no easily-available data with respect to the number of bioscience students among this emigrant cohort, the impact is keenly felt and it is thought that the province loses its 'best' students to HEIs across the water. The loss to the Northern Ireland economy (since many such students never return) is incalculable.

### THE STUDENT POPULATION: ORIGINS

Of the students who choose to stay within the province, many are from the lower socio-economic groups – 34 per cent are from groups IIM, IV and V – and that is significantly higher than the UK average, and better than the benchmark. QUB and UU regularly top such league tables. Many of these students are also first-generation undergraduates.

The impact of these data on teaching and learning is difficult to measure but is probably significant. My own data from two years ago indicate that among bioscience students at UU 71 per cent of them had part-time jobs averaging 16 hours per week. This situation can only worsen and the introduction of 'top-up' fees is viewed with alarm. Student attendance and retention are thus major concerns. Supporting students, including those from non-traditional backgrounds (e.g. those entering with qualifications such as GNVQs), in this changed culture, is seen as a major challenge in the future.

### PARTICULAR ISSUES

There are a number of teaching and learning issues that are probably not specific to Northern Ireland but they do cause furious debate amongst colleagues.

Plagiarism is an important concern. Global definitions of what constitutes plagiarism would be useful as there does appear to be some variance;

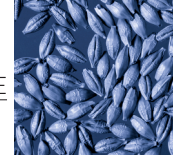
similarly, sanctions and penalties need to be unified and applied consistently. We look forward to some direction from the Centre's working party and pilot work at QUB might also help.

Whilst information technology skills have improved enormously in recent years there has been a steady decline in the standards of literacy and numeracy. Strategies for improving these skills that are not labour intensive and which engage students' attention are seen as essential if the situation is not to worsen further. A numeracy project at QUB could well benefit the HEI bioscience sector. A similar decline in the background knowledge of the physical sciences, particularly chemistry, is also now very apparent.

Personal Development Portfolios – what they are and how they are constructed – will come as quite a surprise to many biology staff at QUB and UU – a large project at UU has yet to 'trickle-down' to staff. Events and articles designed to raise awareness seem appropriate.

The above represent a number of challenges – some would say opportunities. Those challenges have to be met against a backdrop of pressure to maximise research potential and output. It is already possible to see re-organisation of staff in readiness for the next RAE to the detriment of teaching quality. Interesting times indeed!

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# AWAYDAY AT KEELE

**K**EELE UNIVERSITY, STILL one of the smallest universities in the UK, has only been able to devote limited resources to Staff Development. Unlike bigger institutions we do not have the benefit of large full-time units devoted to staff training, particularly of new and experienced lecturers, and to keep us up to date with current thinking and research in educational methods.

None the less, in Life Sciences at Keele we are committed to keeping these matters well up the agenda, and as a minimum have an annual "awayday" for all academic staff in the School.

With no specialist in Staff Development in the biological area it has fallen to me as Director of Undergraduate Studies in Life Sciences — with lots of interest but little expertise — to organise the awayday in the recent past. Browsing the LTSN Bioscience web pages whilst musing on possible content for the summer 2003 event, I clicked on the last item of the home page "Events" column where it says "Invite us!" I was delighted to find a heading "Departmental Workshops and Awaydays" with a list of presentations and workshops on offer — and all for free! A survey of our 25 or so likely participants quickly narrowed down the topics for the day, I chose a date, and within a week or two Heather Sears had agreed that she and Steve Maw would come and lead the day for me.

It was agreed that the event would concentrate mainly on assessment practice: Heather opened proceedings with an introduction to LTSN services and we then spent an hour working through and discussing Ian Hughes' Assessment Audit tool. This was followed by more of Ian's work, this time on Peer Assessment. As Ian himself was unavailable because of external examining, Steve gave his PowerPoint presentation. Our afternoon session was devoted to local presentations, but as ever the most valuable part of the day was the

opportunity for discussion that gets squeezed out of our normal busy programmes.

Feedback on the day from our staff was very positive: committed researchers are often reluctant to take a day out for this kind of event — no surprise there then — and others clearly think that if chalk and talk was good enough to produce the excellent chaps they are, why change it? But even some such doubters admitted they had gained something from the day. The only negative comment was that there was too much emphasis on assessment, and I think this stems from those who still think it is only about measuring student performance, and who fail to see its central place in the learning experience. Peer Assessment was voted the most useful item in practical terms, and several staff have since resolved to introduce it at least as a trial this academic year. The advantages in time saved in marking many long lab reports are the immediate attraction, but the improvement in student learning is of at least equal importance.

As the local LTSN representative, I found it really good to have such great ambassadors as Steve and Heather here on site. I am sure other department representatives will feel as I do that LTSN material I distribute often gets no more than a cursory glance from overstretched academics before being filed. Having the services offered by the LTSN Bioscience team presented face to face had a much bigger impact, and we have more converts to using what LTSN has to offer as a result of the visit. I can only say I would urge others to take up the offer: "Invite us!" on the LTSN Bioscience web pages. You will not be disappointed.

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# NATIONAL EVENTS

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**T**HIS IS THE FIRST LTSN event that I have attended and I have enjoyed it very much" ... "An excellent event — well worth my time" ... "Wonderful, productive meeting — thank you very much"

These are some comments for attendees to our national events. LTSN Bioscience organises national events around the country throughout the year (except August). These events are one-day affairs on a range of themes, e.g. assessment, practicals, teaching ethics to bioscience students, final year projects etc. Such days consist of presentations, time for discussion, activities and opportunities to share practice. As such they provide an ideal opportunity to meet other bioscience academics, discuss the issues around learning and teaching and glean from each other possible ideas and solutions to teaching challenges and issues. Details of up and coming events can be found on our website (<http://bio.ltsn.ac.uk/events/future.htm>). The website also contains reports on previous events. Alongside a summary of the day are summaries of each presentation, plus the slides shown and any handouts given. Event reports provide a useful overview of a particular topic and can be found at <http://bio.ltsn.ac.uk/events/reports/>

If you would like to host an event or have any further questions relating to events then please contact us at [ltsnbioscience@leeds.ac.uk](mailto:ltsnbioscience@leeds.ac.uk)

#### Acknowledgements for photography used throughout this publication

Front cover montage: Gordon Beakes, Brian Wilson, Paul F Brain and Neil Smith; Page 2: Cork, Eden Project, Brian Wilson; Page 3: Bread Wheat, Neil Smith; Page 4: Bumble Bee, Paul F Brain; Page 5: Fallen Leaves, Brian Wilson; Page 6: Botryococcus, Gordon Beakes; Page 7: Fruit Fly Eye, Gordon Beakes; Page 8: Eastern Grey Kangaroo, David Dawes; Page 9: Anabaena, Gordon Beakes; Page 10: Flower Head, Brian Wilson; Page 11: Goat, Brian Wilson; Page 12: Botryococcus mitochondria and plastids, Gordon Beakes

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# 4 | ASSESSMENT OF PRACTICAL SKILLS: "I DO AND I LEARN"

**L**EARNING BY DOING' IS ONE of the most powerful forms of education, because various senses are involved. There is no doubt that practical classes have a pivotal role in the understanding of basic concepts in Biosciences and in the employability of students. However, despite the importance of practical classes, one common intended learning outcome, i.e. the acquisition of practical skills, is very often not adequately assessed. The emphasis of the assessment is often placed on the practical write-up and pays only little attention to the manual competency of the student.

We investigated how practical classes can be designed such that manual competency of Bioscience students and an assessment of practical skills are achieved. To this end we designed and integrated practical classes in two core first year undergraduate Bioscience modules ('A' and 'B') at the University of Kent. Table 1 shows a 'skills matrix (subject specific and practical skills) for the modules.

Students' manual competency was

monitored throughout the two modules and formally assessed at the end of each.

Student numbers were approximately ninety for both modules. To give every student the opportunity to obtain the required practical skills, students worked individually, being supervised at all times by trained postgraduate demonstrators (student:demonstrator ratio of 10:1) and a member of staff. Students received extensive theoretical background knowledge in lectures and workshops prior to the practical classes and also got a brief introduction to the specific laboratory tasks in 'pre-lab' sessions. We observed a rather wide-spread range of skills, e.g. some students were very able to achieve accurate data while others clearly struggled. After students had carried out a specific task, they were asked to produce a short write-up to summarize their results. This write-up, together with a 'comprehension sheet', which linked theory with practice, served as an 'aide memoir'. It was checked and corrected by the demonstrators, but not assessed.

To ensure that students had obtained the intended practical skills, an assessed practical was timetabled and students were informed in advance about the nature of the assessment. In a workshop prior to the assessment a manual for the assessed practical was handed out and potential problems and methodical errors, as well as health and safety aspects were discussed with the students.

In the assessed practical, students repeated one of the previous experiments with subsequent marking of their results. For example, students had to produce a standard curve and determine the concentration of a given protein solution. The marking was mainly based on accuracy, but other factors, e.g. safety, following good laboratory practice, etc. were taken into account. Students who were outside a set error margin and therefore failed the assessment were asked to repeat it. In this case, students were shown again how to use the equipment and potential methodical errors were discussed.

To evaluate the success of this scheme, students were asked about the usefulness of the practical classes and assessments through questionnaires. In general, students commented positively on the organisation of the practical classes and their embedding into the lectures. Students thought that the aims were very well achieved and felt more comfortable with the techniques and the equipment. Students found that "the practicals were structured and set up very well". The accuracy of practical work in later modules improved markedly; however, no quantitative data are yet available.

**Table 1 Skills matrix for the two first year bioscience modules**

Module	Equipment	Techniques	Learning outcomes
A	Pipettes pH meter Spectrophotometer	Accuracy Preparing solutions Dilutions Titration Standard curves Spectroscopy	Use scientific equipment and perform routine laboratory tasks  Prepare solutions and measure concentrations accurately  Analyse and present data
B	Pipettes Spectrophotometer Chart recorders	Enzyme assays	As above  Perform enzymatic assays and determine enzyme parameters

## CONCLUSIONS

From our analysis of the evaluation forms and informal discussion with students we concluded that the project was successful in that it enabled us to assess objectively the manual skills of students. However, we noticed some points that need to be taken into account when this form of assessment is used:

- \* *Suitability of the practical class* – assessed practical classes are a powerful tool in the assessment of





manual competence, however, not all practical classes are equally suitable for this approach. The learning outcomes of the chosen practical classes, being of a numerical nature were comparatively easy to assess. However, a practical class where the main learning outcome of which is the cloning of a gene or the identification of a microbiological specimen cannot be easily assessed in the same way. Careful design of the practical classes and their assessment according to the learning outcomes is therefore important.

- \* *Link between practical classes and theory* — lectures/workshops and practical classes must be closely interlinked. A careful curriculum design and detailed plan of work is very important.
- \* *Differential learning* — we observed a widespread range of manual competency. It is therefore important to address this issue and to provide support for weaker students. This can be done by closer supervision of those students or by giving extra help in the use of equipment.

The practicals discussed in this report are available from the Practical Compendium on the LTSN Bioscience website (<http://bio.ltsn.ac.uk/compendium/>).

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## 'DIS-TRIBUTE'

### A PROJECT TO IMPROVE PROVISION FOR DISABLED STUDENTS IN LAND-BASED EDUCATION

**T**HIS HEFCE-FUNDED project is being undertaken by Writtle College in Essex. The overall aim of the project is to enhance the accessibility of land-based curricula by identifying, and, where possible removing, barriers to participation.

In addition to common accessibility issues, land-based curricula raise other hurdles associated with outdoor practicals and work with animals, and machinery. Conversely, they offer opportunities, such as simulated and real work experience, specialist learning resources, and experience of provision for those with learning difficulties and special educational needs.

The main project outcome is to provide a set of discipline-specific learning and teaching practitioner guides to be used as a resource by staff to address disability issues in vocational curricula in both FE and HE. Academic staff, educational developers and disability specialists will be involved in the production of the guides and the aim is to use existing networks such as the Land Based Colleges Consortium and LTSN Bioscience to aid the dissemination of material. Additionally a range of assistive technologies will be evaluated for land-based curricula using advice from disability specialists and practitioners across the sector.

#### PROJECT OBJECTIVES

- \* raising the awareness of issues relating to students with disabilities, ensuring compliance with QAA Codes of Practice, SENDA 2001 and other relevant legislation;
- \* developing greater sensitivity to disability issues amongst staff and students, engendering confidence in relating to and supporting individuals with a range of disabilities;
- \* developing a comprehensive set of institutional level policies relating to

students with disabilities which are co-ordinated with institutional strategies for widening participation, learning and teaching and Equal Opportunities, and which are particularly appropriate to land-based education;

- \* outlining and delivering (at Writtle) a programme of staff development designed to embed the policies across the whole institution;
- \* exploring, developing and sharing best practice of particular relevance to institutions offering FE and HE programmes in the land-based sector.

In relation to the latter objective one of the project members is currently trying to make contact with disability representatives in land based colleges or universities with land based departments. The aim is to establish a baseline in terms of the number of land based students with disabilities and the nature of these disabilities. If you can provide such information for your institution then the project team would like to hear from you (please contact Jonathon Price at [jbp@writtle.ac.uk](mailto:jbp@writtle.ac.uk)). The project is still in its first phase with a finish date of September 2005.

#### RELATED WEBSITES

The UK Centre for Legal Education which provides a useful overview of the SENDA Act (2001) <http://www.ukcle.ac.uk/directions/issue4/send.html>

The JISC TechDis group who focus on technologies to improve provision for disabled staff and students in HE <http://www.techdis.ac.uk/>

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# 6 | WHAT'S NEW: HIGHLIGHTS OF THE LTSN BIOSCIENCE WEBSITE

**H**AVE YOU EVER VISITED THE LTSN BIOSCIENCE website? No, then we encourage you to do so. Yes, but not recently, then take another look — there is a wealth of new information on there.

chronological order and consist of: summaries of the talks, copies of the presentations, as well as any handouts and other support material. The reports provide valuable overviews of different themes.

## CURRENT ISSUES > EMPLOYABILITY

Ensuring the employability of students is a government priority. As such it is reflected in the university performance indicators and could well become an important factor in a prospective students choice of university. To reflect this growing importance, LTSN Bioscience has devoted a substantial section of its website to the area of employability. The section is structured around a series of 11 questions listed on the front page. By clicking on a question, visitors to the site get an informative summary of the topic and links to other resources if they wish to pursue the topic further. There are also some useful tools: the employability audit and the employability cardsort. The audit provides academic staff with a structured approach to the formative development of

The menu on the left-hand side is the main navigational route through the site. Each section on the menu expands on clicking on the word (as illustrated using 'events')

**LTSN Bioscience**  
Supporting Learning, Teaching and Assessment in Bioscience

Welcome to LTSN Bioscience  
Supporting life, biomedical, food and agricultural sciences

The Learning and Teaching Support Network (LTSN) Centre for Bioscience is one of 24 Subject Centres, funded by the four UK higher education funding bodies, to promote and support high quality learning, teaching and assessment in UK higher education.  
[Learn more about us](#)

**BEE-J Volume 2 now available**

If your browser does not support cookies a 'plain' alternative is available.

Employability issues  
Assessment audit  
EVENT: Making the most of final year projects  
EVENT: Ethics Teaching - one dilemma after another?  
How do you teach ethics?

Sample picture from ImageBank

The above image is from our ImageBank

The yellow box is dynamic and contains shortcuts to pertinent topics

This link provides access to the site's search page

This is a dynamic section of the website and currently highlighting BEE-j

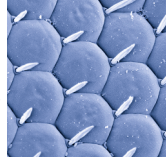
Home | Contact | About | News | Events | Top | Accessibility | Search

To improve accessibility a 'non-frame' version of the front page is available

## EVENTS

The website provides the most convenient way of finding out which events will be happening soon. We advertise all the learning and teaching events that we think will be of interest to bioscience academics. Not only that, you can catch up with the ones you have missed, as the section provides comprehensive reports on LTSN Bioscience events. These are listed in

employability aspects of a course. The cardsort is a tailorable resource which enables students to identify and focus in on the important aspects of employability for them. The 'Industry Skills Expectations for Bioscience Graduates' section provides examples of job descriptions, the appraisal process used by some employers to appraise graduates in their employ and details of graduate training programmes run for newly-employed graduates. Such information is often difficult





## BEE-j

### Bioscience Education E-journal

ISSN 1479-7860



[Home](#) > BEE-j homepage

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BEE-j has its own distinctive section within the website. The side menu provides the route to the articles as well as instructions to authors, submission guidelines and a list of the editorial board members.

[BEE-j Home](#)

[Vol 1 \(May 2003\)](#)

[Vol 2 \(November 2003\)](#)

[Call for Papers](#)

[Submit to BEE-j](#)

[Instructions to Authors](#)

- [General Guidelines](#)
- [Layout Guidelines](#)
- [Review Process](#)

[Editorial Board](#)

- [E B Guidelines](#)

[Email BEE-j](#)

### Introducing BEE-j

Bioscience Education Electronic journal (BEE-j) is an on-line, bi-annual electronic journal owned and published by the LTSN Centre for Bioscience. Its aims are to promote, enhance and disseminate research, good practice and innovation in tertiary level teaching and learning within the biosciences disciplines. It is intended to encourage and facilitate greater understanding and exchange of ideas through being freely available on-line, fully archived and peer-reviewed

The journal will publish a range of articles on tertiary level biosciences education, including peer-reviewed research and practice papers. The journal should be of interest to tertiary level staff and students, upper secondary school staff and employers.

### BEE-j Volume 2 published

Volume 2 of BEE-j was published in November 2003.

We endeavour to make articles available on-line as soon as possible once each review cycle has been completed.

If you are interested in submitting an article for our next edition, please see [Call for Papers](#) for further information.

to find but is useful for staff to help them show students the types of skills and attributes which are assessed by employers.

#### RESOURCES & KB > AUDITS AND CASE STUDIES

This section contains material you may have seen at an LTSN Bioscience event or may wish to use at your own workshops. The audits provide a framework to allow academics to evaluate aspects of their modules or courses, currently we have two audits, one on assessment and the other on employability. Scenarios provide a useful way of getting groups to discuss an issue. We have three plagiarism scenarios and are developing some for the teaching of ethics.

#### PUBLICATIONS > BEE-J

In response to community demand LTSN Bioscience now has a peer-reviewed journal – BEE-j. BEE-j stands for Bioscience Education E-journal and reflects the fact that the journal is published on-line and contains articles on learning and teaching in a bioscience context. The journal aims to be a convenient place for academics to publish learning and teaching research articles as well as a source of accessible pedagogic research. Articles are put up on our website as soon as they have been accepted but collated together into issues for archiving purposes. The first issue came out in May 2003, a second followed in November. The issues contain a range of articles on tertiary level education including research articles, descriptive accounts and personal

overviews. Guides for authors, submission forms, the editorial board as well as the articles themselves are all available on the website.

#### NETWORK

LTSN Representatives, Special Interest Groups, Heads of Bioscience units, Country Consultants and Staff and Educational Developers staff groups within the bioscience educational network, each have their own series of pages under the Network area of the website. Information has been organised on the basis that it is likely to be of interest primarily, but not exclusively to each group.

Do we have a Representative in your unit, and if so, do you know who they are? Maybe you are a Rep who would like to make contact with Reps in other institutions? The list of Representatives will put you in touch. Information on recent developments across the HE sector including policy, both current and proposed are available from the Heads of Bioscience Units section, along with links to external websites and documents relating to the same.

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## 8 | WORLDWIDE DAY IN SCIENCE

**A**LLOCATE TIME FOR YOUR STUDENTS TO WATCH a scientist on 15 April 2004 and let them become part of the *Worldwide Day in Science*. The students then need to mould that day's observations into short, appealing, multimedia stories and mount them on a website, a site that links such observations from around the world. It is that simple.

The day engages students in a range of 'best practice' learning strategies — problem-based learning, use of global networks of students, and multimedia. The students get a taste of where a career in science might take them. They build the professional skills that are in demand, according to surveys of employers and recent science graduates — oral and written communication, teamwork, and managerial abilities.

A local pilot, *A day in the Life Sciences in Australia*, has been successfully completed by 82 second-year Science undergraduates at the University of New South Wales in Sydney. Students report:

"The project seemed quite over-whelming at first; however it turned out to be a thoroughly enjoyable experience."

"Reflective assessments were helpful. I will have fond memories of this course."

"A great experience. It really gave me a 'preview' of how things might be in the future. It also gave me a rough idea of what to expect and how to deal with teamwork at my future workplace. I will fully encourage anyone to take the course."

The course coordinator states, "It was the easiest course I taught. The students did all the work."

Hundreds of copies of the resulting CD-ROM are being distributed to high schools. An online version of the students' product (sans video due to download times) can be seen at: <http://www.scom.unsw.edu.au/life/index.htm>.

Students engaged in the *Worldwide Day in Science* will work much like the photographers capturing *A Day in the Life of India*. Our multimedia format, however, permits photos and text to be accompanied by voice and video. The website will reveal to an audience of high school students how scientists the world over comb the wilderness for lizards, grow microbes in the laboratory, or scan the heavens.

The *Worldwide Day in Science* process begins when students nominate for roles, whose duties the students need to discover for themselves. Planners and team managers have to guide student reporters, producers, editors, and technical production staff. Basically, the reporters and producers develop multimedia stories that the editors and production staff then tailor for addition to the *Worldwide Day in Science* website.

The students learn how to work in teams, hierarchies, and production lines; how to handle concrete deadlines; how to communicate effectively and delegate responsibility; and how to deliver a professional product for public consumption. The challenge is daunting for some — wrestling with unanswered emails, missed meetings, ignored guidelines, and a lack of preparation. For most, it is an exciting window into what a botanist, psychologist, or astro-physicist does all day. All have

the opportunity to become part of a worldwide network of scientists-in-the-making.

The international pilot of a *Worldwide Day in Science* is scheduled for February-June 2004. Universities from China, Spain, the Middle East, and North America have expressed interest (as of December 2004), in fields ranging from astrophysics and chemistry to food science. Further participants are welcome in this pilot, and broader involvement is sought for 2005. You can allocate a semester to it or just a single writing assignment. Experience in problem-based learning will make it easier for you to let the students make mistakes. Guidelines and examples from our pilot *Day in Science* are available online. Email me for access and the URL.

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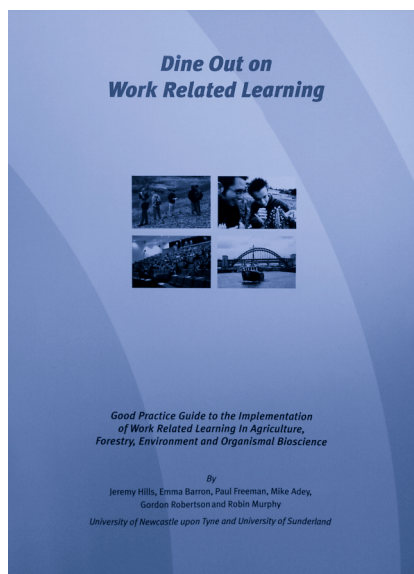
## DINE OUT ON WORK RELATED LEARNING

**T**HE FDTL-3 PROJECT, *REAL WORLD*, HAS recently published its good practice guide on the implementation of work-related learning in agriculture, forestry, environment and organismal bioscience. With an ever-increasing emphasis on the employability of our graduates, *Dine Out on Work Related Learning* is a timely guide for those on the frontline of delivering quality teaching with an emphasis on developing the high level skills and knowledge that graduates need in an increasingly competitive job market.

*Real World* aims to support students to prepare for and, make the transition into, employment by improving work related learning (WRL) within the curriculum of QAA Unit 17 (Agriculture, Forestry and Agricultural Science) and elements of Unit 7 (Biology — Organismal Bioscience). The project developed a conceptual framework against which the delivery of WRL can be judged. The subsequent experience of WRL curriculum developments at the Higher Education Institutions (HEIs) in the project consortium and at a range of HEIs nationally has formed the basis of *Dine Out on Work Related Learning*.

Whether you are new to the world of WRL, or are looking for ideas to enhance existing practice, you will find something





here to tempt you. Designed like a menu to allow you to snack or feast, the guide's sections cover everything from the background and basics to delivery and assessment as well as how WRL can be used to enhance graduate employability. Underpinning the menu is an emphasis on sound pedagogical practice and the need to ensure

that WRL fits into the main cornerstones of curriculum design. All too often, employability is considered in isolation and the temptation is to 'bolt on' elements of skill development or to 'do' employability outside the context of the discipline. This guide outlines the integrated approaches adopted by a variety of HE institutions.

Work related learning goes well beyond the notion of placements and this guide covers a whole range of activities including using case studies, developing and organising student-led conferences, simulations as well as networking with professionals and business. The guide aims to provide straightforward advice on how to implement WRL and as such is packed with practical examples of the ways that academics have used WRL to enhance Higher Education curricula in biological and environmental disciplines. Although the material presented here is discipline-based, many of the lessons learned can be applied across the whole HE sector.

Two contrasting extended case studies form the dessert section. They include information about aims and objectives, teaching and learning methods, assessment and reflections on the successes and learning points for the academic staff involved in them, encompassing the four cornerstones of curriculum design and illustrating how a single module can provide a coherent package of WRL.

Final food for thought comes in the shape of WRL in the future. Issues such as progression, strategic learners, diversity and accessibility are considered in the context of WRL and employability and encourage you to plan for the use of WRL in your own institution in the future.

Presented in an easily digestible format, *Dine Out on Work Related Learning* takes a significant step towards cutting through the talk about WRL and delivering practical advice on how to make it real. If you would like a copy of the guide, please contact me at the address below.

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## BEE-J: VOLUME 2

THE SECOND VOLUME OF BEE-J HAS NOW BEEN published. The articles are outlined below and available on our website (see <http://bio.ltsn.ac.uk/journal/vol2/>). We also invite submissions for volume 3 of BEE-j, see the BEE-j website for further information, layout and submission guidelines.

### ARTICLES

*Research skills training for undergraduate researchers: the pedagogical approach of the STARS project.*

John A Finn & Anne C Crook, Johnstown Castle and University College Cork, Ireland

*Making a Level Playing Field at Master's Level – an application of self-directed learning.*

Lesley-Jane Eales-Reynolds, University of Surrey

*The use and abuse of PowerPoint in Teaching and Learning in the Life Sciences: A Personal Overview.*

Allan Jones, University of Dundee

*Evaluating University Masterclasses and School Visits as mechanisms for enhancing teaching and learning experiences for undergraduates and school pupils. A pilot study involving biotechnology students.*

Angela Todd & Denis Murphy, University of Glamorgan

*Evaluation tools for investigating the impact of assessment regimes on student learning.* Evelyn Brown, Graham Gibbs & Chris Glover, The Open University

*Multiple Choice Questions – a Reprieve.*

Ray Harper, University of Luton

*Biology Before and After Bologna.*

Charles Susanne, Free University of Brussels

### REVIEWS

*Blueprint for computer assisted assessment.*

Allan Jones, University of Dundee

### LETTER TO THE EDITOR

MCQ, EMSQ or multiple true/false questions?

David Bender, University College London

Submissions for the next edition of BEE-j (May 2004) are now invited. The submission deadline is 31 March 2004.



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# SPAT (STUDENT PROGRESSION AND TRANSFER) PROJECT ENTERS NEW PHASE

**T**HE FDTL-3 SPAT PROJECT HAS BEEN WORKING for the last three and half years in the context of the collaborative provision of higher education by Higher Education Institutes (HEIs) and their 'partner' Further Education Colleges (FECs).

The project has looked at both operational and strategic issues with particular influence on the experience of students undergoing progression and transfer. This requires a partnership between those staff preparing and receiving the students, and between staff and students.

The primary aim was to promote effective student progression between HE levels, and transfer across institutional boundaries. The specific target group was students progressing from Higher National Diploma (HND) into the second or third year of an honours degree programme (sometimes called "top-up" or direct entry students), although the materials developed have a wider applicability.

In any one department there may be small numbers of top-up students but the cumulative effect of provision means that there are a significant number of students affected by transfer and progression. The introduction of foundation degrees is also likely to increase the number of students involved in top-up degrees.

SPAT has worked with around fifty HEI, FEC and LTSN partners in developing, trialing, and evaluating a range of customisable materials. The project has produced guidance materials on structures, approaches, methods, stages and checklists. It has also created case studies and collected examples of customised materials.

Materials for both staff and students were developed in a variety of formats. There are good practice guides for staff, aimed at raising awareness among staff of the needs of top-up students. For students, there are flyers, FAQs and checklists. Their use is explained in the introduction and in the transferability document and they can be used at various points in the student life-cycle. The project has identified four periods as particularly appropriate for the use of SPAT materials: when students are planning whether or not to progress further in higher education; when students have been accepted for a top-up programme but not yet started it; the induction period for the new programme; and the first semester of the new programme. The materials are also suitable for use by staff teaching HE in FECs and HEIs, support staff, e.g. library, IT, careers and staff supporting

partnerships between FECs and HEIs.

The principal topics covered in the materials are: culture shift, pre-planning, induction, student support, understanding the modular scheme and key skills. There is also a pack on transferability that deals with adapting the materials to different contexts, and includes examples of how partners have used and customised the SPAT materials.

The student materials will be most useful if customised for the relevant institution to reflect local terminology and conditions. The optimal mechanism for distribution to students is through staff.

It has become apparent during the course of this project that many of the progression routes and good practice materials for transferring students are most efficiently delivered in the context of multi-institutional and regional partnerships between FECs and HEIs. There is therefore a partnership pack that gives information relevant to those initiating and working within partnerships, with particular focus on the issues that affect student progression and transfer.

Copies of the materials are available on CD-ROM and on the SPAT website (<http://www.spat.ac.uk>).

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## STUDENTS INTO SCHOOLS, COLLEGES AND COMMUNITY

**B**OTH GRADUATE EMPLOYABILITY AND WIDENING participation in HE have been recurring themes in recent LTSN Bioscience debates. Newcastle University and Northumbria University run a joint project that tackles both these issues through a range of student tutoring and mentoring programmes.

The North-East of England has one of the lowest progression rates to further and higher education in the country. One method used to try to tackle this deep-rooted problem is to offer undergraduate students the opportunity to tutor and/or mentor learners in the local community. In one particular programme that is the largest of its kind in the UK, students can gain academic credit for their work using an innovative assessment process.

Based in Newcastle and Northumbria Universities and established in 1993, the Tyneside and Northumberland Students into Schools, Colleges and Community Project (<http://www.ncl.ac.uk/sis/>) offers bioscience undergraduates,



alongside students of any other subject, the option to help local learners and to gain academic credit towards their degree for doing so. In the first semester 2003/04, over 500 students, of whom 68 were studying disciplines covered by LTSN Bioscience, worked in 170 different placements as student tutors.

Students are carefully matched with placements relating to their subject and career interests, but all placements involve teaching or education work of some sort and aim to inspire local learners who may not normally come into contact with university students. Assessment is based on:

- \* a learning log completed by the student;
- \* assignments that ask the student to identify and give evidence for generic self-management and interpersonal skills that they have developed and demonstrated whilst on placement;
- \* a final report from the supervising teacher at the placement.

The focus is as much on being able to evaluate and articulate what has been learnt as on the individual experiences gained, using a reflective learning practitioner cycle based on theoretical constructs.

As an example, two students who are studying biomedical science and applied biology have been working for one day a week at the Life Science Centre in Newcastle. The centre runs a wide range of educational activities, from laboratory-based sessions for children whose schools may lack really up-to-date equipment and facilities, to workshops for adults. The benefit for learners and universities of having an enthusiastic ambassador is clear: "I have mentioned that Uni. can be fun and is open to anyone if they really want to go."

Embedding these activities in the curriculum widens access to high quality work experience that some students could not otherwise afford to do unpaid. The experience can be crucial in prompting students to think imaginatively about what they find exciting about their subject and what they can offer an employer. As the Education Manager of the Life Science Centre puts it, "Work in a Science Centre can be a lot more varied than conventional school teaching ... initiative, resourcefulness and an ability to take control are as important as subject knowledge. These are valuable skills which are transferable to business and research as well as to teaching. The students who have been with us on placement have been really useful because they have been prepared to be very adaptable."

For another undergraduate studying Marine Biology, her module working on the Schools Ecology Programme at the Dove Marine Laboratory in North Tyneside is an opportunity to distil and articulate her subject knowledge by working on an outreach programme alongside a university tutor in her own field. In contrast a human genetics student interested in journalism has chosen a placement run by the local newspapers, working with school children to produce articles that are then published in the local press.

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# GET INVOLVED: NUMBERS COUNT

## IMPROVING MATHEMATICAL LITERACY SKILLS

**A**RE YOU CONCERNED ABOUT THE MATHEMATICAL skills of Bioscience entrants? Then perhaps you will be interested to know that Vicki Tariq was awarded a National Teaching Fellowship earlier this year. The aims of her NTFS project are to define more accurately the problems bioscience students encounter with mathematics and to evaluate the impact of a variety of intervention strategies on students' mathematical skills. She would like to hear from you if you are interested in the project aims and are eager to share experiences and exchange practice with others. LTSN Bioscience has set up an email discussion list to facilitate discussions regarding the mathematical skills of bioscience undergraduates. We hope that this initial form of communication might facilitate:

- \* establishing a network of academics who are interested in discussing issues related to the mathematical skills of undergraduates in the biosciences;
- \* identifying views and current experiences;
- \* identifying examples of good and particularly innovative practice in addressing common concerns.

If you would like to join this discussion forum, please contact Vicki Tariq at the School of Biology and Biochemistry, Queen's University Belfast ([v.tariq@qub.ac.uk](mailto:v.tariq@qub.ac.uk)).

Alternatively, you can email Heather Sears at LTSN Bioscience ([h.j.sears@leeds.ac.uk](mailto:h.j.sears@leeds.ac.uk)) with the message 'Join maths list' or send an email to:

[jiscmail@jiscmail.ac.uk](mailto:jiscmail@jiscmail.ac.uk)

with the following text *in the body of the message*:

'subscribe biomaths-ed *firstname lastname*'.

**Dr Heather Sears**  
LTSN Centre for Bioscience  
[h.j.sears@leeds.ac.uk](mailto:h.j.sears@leeds.ac.uk)

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## AIMING TO BRIDGE THE GAP BETWEEN SCHOOL AND UNIVERSITY BIOSCIENCE

IN NOVEMBER 2003, THE FIRST meeting of the Biosciences Federation Education Committee was able to offer its endorsement to the Biology4all.com website (<http://www.biology4all.com>) hosted by the University of Central Lancashire. This continues a relationship established between the site and the UK Life Sciences Committee some years ago, which has enabled a variety of interesting web-based projects to develop.

subject specialism. The database enables university academics to enter the details of any talks or workshops they are willing to give, together with suitable age groups, the facilities they require and any costs involved. Speakers also stipulate the distance they are willing to travel. Thus when the database is queried by a school-teacher wanting to get someone to visit their school the system will only return relevant speakers willing to travel to

Less visible on the website — but of great importance — are the private email discussion lists run for both schools biology teachers and school science technicians. These lists now have over 1,300 subscribers in schools, colleges and universities across the UK and beyond. The biology teachers list, called BIOTUTOR-L was originally set up by Peter Robinson at the University of Central Lancashire in March 1998 and quickly outgrew its local roots to become a very active national forum for the discussion of issues related to the teaching of biology in schools.

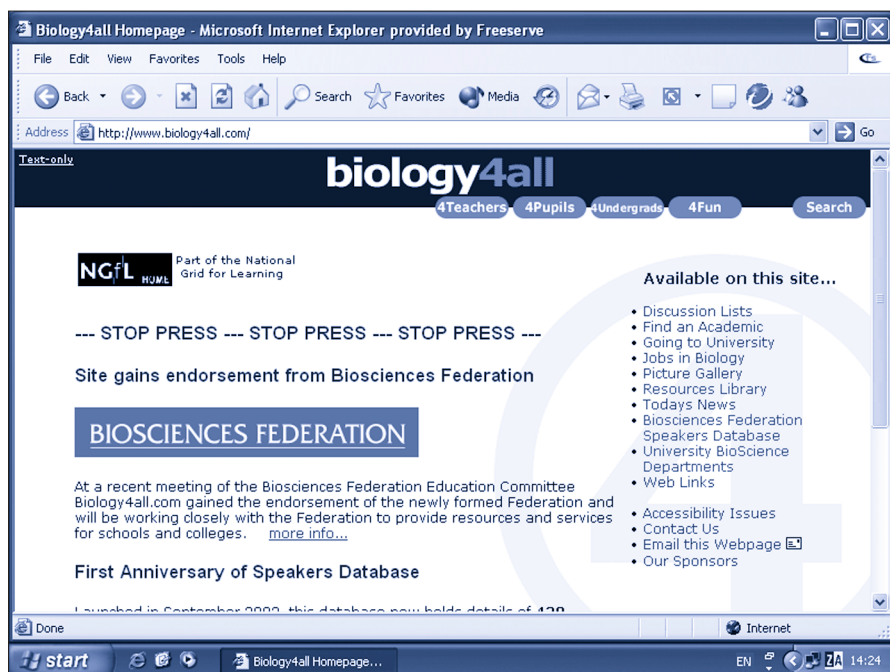
Many universities, learned societies and similar bodies nowadays use BIOTUTOR-L to stay in touch with events going on in schools (predominantly at AS and A2-level) and also to help them in developing, organising and advertising non-profit making courses and workshops for school teachers and their pupils.

A key feature of these discussion lists is their private nature, with subscription being limited to those with a professional interest in education. Anyone interested in joining either of the discussion lists can find full instructions at [http://www.biology4all.com/discussion\\_lists.asp](http://www.biology4all.com/discussion_lists.asp).

Members of the discussion lists have also been encouraged to deposit their learning materials within the resources library found within the site. This already contains over 100 items, including many useful sets of lecture notes, formative assessments, PowerPoint presentations and Flash animations.

The Biology4all site has recently been highlighted at the Biosciences Federation Education Colloquium, *Changes and Challenges — the New Science Curriculum* (<http://www.bsf.ac.uk/edu/default.htm>). It is envisaged that the recently announced collaboration with the Biosciences Federation and its member societies will lead to greater academic participation in current projects, and also to the development of further ideas to enable biology teachers in schools and bioscience staff in universities to communicate more effectively.

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Biology4all is arranged as a portal providing an extensive array of links to a variety of bioscience resources, including direct links to over 300 UK University Bioscience Departments (the total includes medical, dental, veterinary, nursing and midwifery Departments) together with information for school pupils considering a university education.

The site also hosts the Biosciences Federation Speakers Database, a resource of 400-plus academics, willing to visit local (or in some cases not so local) schools to give talks on their

that particular location. The project, which first began with the UKLSC in September 2002, is now just entering its second year of operation and has already registered 240 requests for speakers to visit schools and colleges across the UK. Should any university academic wish to join the scheme, contact me at [pkrobinson@biology4all.com](mailto:pkrobinson@biology4all.com) with your university postcode (for location purposes) and your major society affiliations (if any) to enable the appropriate society logo to appear on your entry within the database.