

## Raising Teaching Status in Universities

### – PROMOTION, PERCEPTIONS PRACTICE AND POLICIES

The UK Higher Education system produces highly employable graduates throughout the bioscience disciplines and is held in high esteem worldwide. However, during this period of RAE reflection and REF planning it is important to remain mindful of the promotion of the status of teaching in order to avoid possible misconceptions about the professional contributions by teaching practitioners. Is there a rise in the teaching practitioner's perceptions which have led to a belief that their contributions to their institution are not similarly rewarded as those in primarily research roles? A highly perceived value of excellence in teaching has not always sat at the heart of all university academic career profiles and paths. The government white paper 'The Future of Higher Education' (2003) ([www.dcsf.gov.uk/hegateway/strategy/hestrategy/pdfs/DfES-HigherEducation.pdf](http://www.dcsf.gov.uk/hegateway/strategy/hestrategy/pdfs/DfES-HigherEducation.pdf)) recognised the need to balance reward and recognition between research and teaching activities. Undoubtedly, whilst the creation of the Higher Education Academy in 2004 has also raised the status of university teaching nationally, local initiatives are also paramount. It is encouraging that in recent years the definition of academic career families has in some universities led to the formalisation of a Teaching and Scholarship job family (for example at Exeter University) which gives clear indications of the expectations and responsibilities of staff at all levels allowing individuals to plan career progression and support progression within teaching. There may now be a need for debate about the relative academic worth of pedagogic vs scientific research influenced by RAE reflections.

Interestingly, informal discussions at the UK Centre for Bioscience 2008 Reps Forum revealed that many academics involved in teaching still consider there is a bias towards progression in research orientated careers compared to teaching centred jobs. Is this really the case? The Higher Education Academy has provided a well adopted mechanism for recognition at a national level through the National Teaching Fellowships. It is also interesting that the UK Centre for

Bioscience's web site lists individuals who have been awarded for teaching excellence by their institution. However, there appears to be no UK wide standardisation of criteria for these teaching awards, but is there a case for this?

The 2009 Higher Education Academy and GENIE Centre for Excellence in Teaching and Learning interim report on 'Reward and Recognition of Teaching in Higher Education' ([www.heacademy.ac.uk/ourwork/research/rewardandrecog](http://www.heacademy.ac.uk/ourwork/research/rewardandrecog)) highlights a number of areas for consideration e.g. "Promotion to senior academic positions is still weighted in favour of academics who focus on research over teaching activities, according to Parker (2008)." The interim report's main conclusions indicate differences in staff perceptions on awarding and rewarding teaching exist.

The UK needs highly qualified and well trained bioscientists in order to maintain a worldwide leadership. The rapidly changing technologies and demographic needs of the country require a modern workforce with excellent training. Moreover, the future for UK Higher Education is set in a global marketplace. In this competitive world should it not be essential that excellence in bioscience teaching is appropriately rewarded and celebrated nationally? Is there a belief at all levels of teaching and academic management that there are robust systems to ensure this is successful locally? Are teaching practitioners suitably aware and responsive to their opportunities for reward and recognition? The practical measures and policies of UK Higher Education Institutions which recognise and reward teaching and their methods of implementation will be summarised in the awaited GENIE and Higher Education Academy's final report. This may enable practitioners at all levels and senior academics to assess the efficacy of the translation of university policy into practice. Thus discussion of the importance of promotion for good teaching remains crucial if the status of teaching is to be raised in all universities.

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## 2 | Reward & Recognition: University Teaching Fellows

UK universities recognise outstanding learning and teaching contributions throughout the disciplines. The UK Centre for Bioscience has highlighted 5 UK bioscientists who have received different types of institutional recognition over the past year. Many of these were brought to our attention following a call in previous Bulletin editions and on our web site. To view additional recipients of both National and University Teaching Fellows, please visit [www.bioscience.heacademy.ac.uk/funding/recognition/ntf.aspx](http://www.bioscience.heacademy.ac.uk/funding/recognition/ntf.aspx)

### Momna Hejmadi

I began my research career in radiation oncology but since moving to the Department of Biology & Biochemistry at the University of Bath, I have diversified my research interests to hypoxia signalling networks and DNA repair. Bath is also where I discovered that I really enjoyed teaching and have had the privilege of working with the most wonderful bunch of students and staff for the past 9 years.



As a Senior Teaching Fellow, I have been proactive in securing funding to introduce several innovative teaching strategies, which have been commended by students, colleagues and external examiners. For example, I have introduced new and innovative styles of online learning and peer assessment that serve as prototypes for colleagues within the institution. I have also introduced new undergraduate courses and a postgraduate programme on biotechnology & enterprise, designed for students with enthusiasm for enterprise and who intend to pursue a career at the interface of technology and commerce. I have implemented innovative arrangements for final year projects for biochemistry students designed to maximise resources without compromising academic learning, while also providing a means for developing key skills in biosciences.

Since 2003, I have been mentoring the professional development of colleagues through the institutional Post Graduate Certificate in Academic and Professional Practice Programme (PGCAPP) and run workshops related to teaching and curriculum design. On the other end of the scale, I try and encourage school students to take up science through outreach activities such as summer schools and practical hand-on workshops for schools through the 'Widening Participation' and 'Aimhigher' initiatives. These activities have been very popular, especially making a DNA necklace using their cheek cells.

I received the Mary Tasker Award for Excellence in Teaching in 2002 and the Innovations in Learning and Teaching Award in 2008. My current teaching interests are in developing video databases for practical training and placement learning, piloting the use of open educational resources and supporting learning on placement.

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The message is sometimes explicit: 'to spend so much time on teaching is career suicide!' More often it is implied: 'applicants for this post must have a substantial research record; teaching experience would be welcomed.' Either way, new lecturers in HE quickly learn that a genuine commitment to the integration of research and teaching is hard to maintain. I have seen people start full of enthusiasm and then realise that career progression requires them to reduce their teaching. I have also known people take the difficult decision to leave their original discipline behind to enter educational development. And I have contemplated following both paths. But what for those of us who really want to remain amphibious, slipping from one world to the other and, we hope, enriching and being enriched by both? This remains a hazardous niche; relying on two habitats brings vulnerability to stresses in both. Despite the rhetoric supporting 'teaching and research' links, it can often feel that academic amphibians are doomed to extinction.

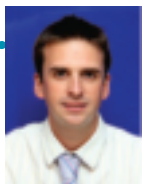


There are places where populations are thriving though, and I am fortunate enough to work at one. I arrived at Edinburgh Napier fairly fresh from PhD research on estuarine ecology. I was surprised to discover that I liked teaching and wanted to learn more about it. The University's postgraduate certificate in Tertiary Teaching Methods provided the ideal way to do that, and also introduced me to pedagogical research. I was intrigued to realise just how much remained unknown about education, and how many important questions could be researched within my own practice. Ever since, professional challenges such as how to give good feedback, how to create engaging and interactive teaching sessions and how to choose the right kind of assessment have been transformed from problems into opportunities for reflective research. The University runs a teaching fellows scheme, designed to recognise and foster excellence in teaching. Becoming a teaching fellow, and later a senior teaching fellow, allowed me to join with a community of like-minded colleagues from a range of backgrounds to learn from and support each other in teaching and pedagogy. The Higher Education Academy, and in particular the UK Centre for Bioscience, has provided the opportunity to extend this community to institutions across the UK. And yes, I have managed to keep my original disciplinary interests (now particularly in mangrove ecology) alive. So amphibians take heart! It is possible to enjoy the best of teaching and research.

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### Neil Morris

I am currently the Director of the Undergraduate School in the Faculty of Biological Sciences at the University of Leeds. I have been an academic member of staff in Biological Sciences



since September 2002, and I hold a senior lecturer (teaching & scholarship) contract with the university. I am currently also seconded to the role of faculty Virtual Learning Environment (VLE) coordinator for the implementation of the new institutional VLE. In 2006-07, I worked on the implementation of the Student Portal in Biological Sciences. I now have a major research interest in the use of blended (e-) learning solutions to enhance the learning and teaching experience for undergraduate students. I have been awarded several rounds of Teaching Quality Enhancement Funds to deliver enhancements in blended learning within Biomedical Sciences, and I obtained UK Centre for Bioscience funding in 2007 to assess the impact of podcasts and mobile technology on the student experience and examination performance ([www.bioscience.heacademy.ac.uk/resources/projects/morris.aspx](http://www.bioscience.heacademy.ac.uk/resources/projects/morris.aspx)). I am also actively involved in neuroscience research, in collaboration with members of the neuroscience community at Leeds ([www.neural.leeds.ac.uk/](http://www.neural.leeds.ac.uk/)).

I was awarded a Developmental University Teaching Fellowship in 2006 in recognition of my work on the Student Portal. I pursued a project to provide enhancements to this software and its use for our students, in conjunction with the University Portal Team and the suppliers. I was awarded a Full University Teaching Fellowship in 2008 in recognition of my work on blended learning approaches to HE. I will be running a research project to evaluate the effectiveness of a range of blended learning solutions on the student experience, and importantly on examination performance. I am currently interested in the relative usefulness of Articulate Presenter, Podcasts, Multimedia and Mobile Technology for the delivery of effective blended learning.

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I never intended to apply for a University Teacher Fellowship or submit the portfolio of evidence within the deadline that was only three weeks away, but give me a challenge and it is like a red rag to a bull. Subsequently I did apply, and was awarded a fellowship in 2008.



My background is in gastrointestinal physiology and for many years I worked in industry; I then joined the University of Nottingham where my artistic interests started overtaking my scientific ones, (I substituted my intestinal juices for creative ones, groan). This started within the School of Nursing, when spying another challenge, I found myself volunteering to develop animations having never having done so much as a stick man walking before. I taught myself to use the software "Flash" and produced several resources for their "CETL for Reusable Learning Objects" thus the seeds were sown.

I moved to De Montfort University in 2004 and was appointed 'e-learning Champion' for the School of Allied Health Sciences, bringing in new technologies and supporting staff. For the fellowship I aim to continue developing animations and conduct research into student use of multimedia; I'm interested in understanding how to harvest the fun, motivating elements of animation without endangering the focus required for deep learning. So far, I have developed a web-based laboratory skills builder "Virtual Analytical Laboratory" to support student transition to science at university.

I was overjoyed to receive the award and it has introduced me to a buoyant network of university staff. My research interests are now firmly rooted in applying new technologies to higher education, and I enjoy tapping into the enthusiasm for learning that technology brings. As one student said "I love e-learning, it helps lock things into my brain."

For more information about the De Montfort University Teacher Fellow Showcase, please visit:

[http://hlsweb.dmu.ac.uk/ahs/elearning/Animation\\_Showreel/Showreel.html](http://hlsweb.dmu.ac.uk/ahs/elearning/Animation_Showreel/Showreel.html)

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In 2005-06 the University of Glasgow introduced Teaching Excellence Awards to "recognise and celebrate members of staff whose teaching is of a particularly high standard." In 2008, the Level 1 (L1) Biology Teaching Team (Andrea Brown, Anne Tierney, Joanna Smith and Douglas Neil) were presented with the award "in recognition of their effective, responsive and creative approaches to administering, teaching and supporting the learning of a large group of students in their first year at University."

Every year around seven hundred students come to the University of Glasgow to study biology in their first year within the Faculty of Biomedical and Life Sciences. Most of the students are between seventeen and eighteen years old when they arrive for the first time at the University, and find themselves in an environment which is a far cry from their previous educational experience. The Level 1 Biology Teaching Team has aimed to reduce their transitional problems and to resolve other issues associated with large-class teaching by providing the students with a wide-ranging curriculum, varied assessment procedures and a supportive learning environment.

This has been achieved through an open-door policy for student support and an integrative approach to large group teaching, including: the promotion of peer support and independent research skills via group projects run throughout the year; the facilitation of debate within lab classes via small-group discussion sessions; and the enhancement of core skills via workshops and tutorials. To increase inclusivity and promote accessibility they have also made extensive use of the possibilities available within the University's virtual learning environment, Moodle, using it as a platform to provide students with additional communication routes, shared spaces for coordinating group projects and interactive forums.

The Teaching Excellence Award gained by the L1 Biology Team was based on an assessment of a portfolio of their achievements, and on the recommendation of both their peers and of the students in the class. Reflecting the importance of this award, it was presented to them officially at the annual degree ceremony of the University.

#### Andrea Brown, Douglas Neil, Joanna Smith and Anne Tierney

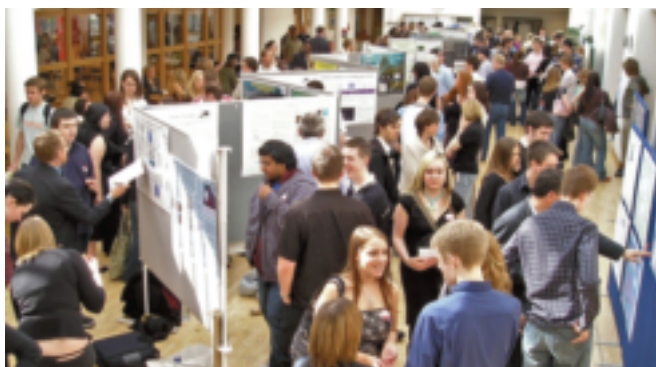
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# 4 | Capstone Experiences to Support School Research Events



In the American University system, the capstone experience often is an integral part of the undergraduate curriculum. The basic principle has been outlined briefly in the report of the Boyer Commission: "All the skills of research developed in earlier work should be marshalled in a project that demands the framing of a significant question or set of questions, the research or creative exploration to find answers, and the communication skills to convey the results to audiences both expert and uninitiated in the subject matter." (<http://naples.cc.sunysb.edu/Pres/boyer.nsf/>). In contrast to the United States, the British undergraduate degree does not normally include a formal capstone experience. Yet, the final year research project that is a required element for undergraduate courses in the biosciences already incorporates a number of the characteristics which define a capstone experience. The final year project is an important step towards independence, provides the students with the opportunity to apply their skills and knowledge, and gives them a sense of achievement. Not surprisingly, many students regard the project as the best part of their degree course. However, after the excitement of the project itself, the submission of the thesis can feel like an anti-climax. Often the thesis is only ever seen by the examiners, and then filed away in a dusty cupboard. Students are left with the feeling that hardly anybody is interested in their work and that they had little opportunity to communicate their findings.

Therefore, in Portsmouth we considered possible ways to end the final year on a high and to turn the project into a capstone experience. Our solution has been the School Research Day, which features at its core the presentation of all projects and dissertations as posters. While poster presentations are frequently used in the assessment of final year projects, the School Research Day differs in placing the emphasis on exhibiting the diversity and quality of undergraduate research in the department, rather than primarily on the assessment. Apart from the 3rd year students themselves, the event is attended by all academic staff, many of the School's non-academic staff, 2nd year students, external examiners, and visitors from inside and outside the University. The presence of external visitors, including potential employers makes the students

acutely aware of the importance of their presentations, as we effectively entrust them with being the department's ambassadors to the outside world.

We designed the School Research Day as a whole-day event. In the morning, students and visitors go through a conference-style registration, which already marks the day as a special event contrasting with anything the students have experienced in the previous three years of their course. The poster viewing itself follows the style of poster sessions at scientific conferences. For the first half of the session students are expected to stay by their poster and explain it to visitors. The hall is soon filled with lively activity as students are eager to present their findings, while visitors are likewise keen to get an impression of the undergraduate research in the department displayed on more than a hundred posters. After the initial buzz, students are encouraged to visit the posters of their fellow students, not least since the student vote decides the winner of the Poster Prize. The Prize presentation in the afternoon, following careers advice from a graduate recruitment agency and a research talk by an academic staff member, marks the end of the Research Day.

The School Research Day has proven to be popular with staff, and a great experience for the students as they are ending their undergraduate time and prepare for a professional future. It is the culmination of their final year project. For weeks the students have been working hard in the laboratory, field or library, have assembled their results in a thesis, and now meet the final challenge – presenting their work to the department and to the outside world. Right from the inaugural Research Day in 2006 the students met the challenge very well. Year after year posters as well as presentations fulfill or even surpass the supervisors' expectations. For the students, as their confidence grows during the day, pride of their achievement replaces their initial anxiety. Moreover, because of the attention given to their poster by staff and external visitors the students themselves appreciate more the value of their work. The feedback indicates that the students see the Research Day as a truly memorable experience to cap their studies.

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## Bioscience Horizons

Bioscience Horizons, Issue 1 of Volume 2, is now available containing 10 refereed papers written on the basis of undergraduate projects from across a wide range of bioscience subjects. Issue 2 will be available shortly and the editorial board will shortly be seeking nominations for Volume 3. Please visit the Journal website at [www.biohorizons.oxfordjournals.org](http://www.biohorizons.oxfordjournals.org) for further details.

# PDP for International Postgraduate Students

The Higher Education Academy published a report in January 2008, The Taught Postgraduate Student Experience ([www.heacademy.ac.uk/assets/York/documents/ourwork/research/surveys/PGTSurvey.pdf](http://www.heacademy.ac.uk/assets/York/documents/ourwork/research/surveys/PGTSurvey.pdf)). The survey provides a snapshot about what students undertaking taught postgraduate programmes in the UK think about their experiences. Overall, students had very positive experiences on their taught programmes. However, careers advice was rated slightly less positively, although this is probably associated with international students arriving in the UK with unrealistic expectations regarding the role of UK Careers Services. The survey does suggest that there is scope for enhancing taught postgraduate careers provision especially as the UK HE experience is increasingly marketed to international students as a firm foundation for a successful career. Universities up and down the UK therefore have a responsibility to make this a reality by ensuring employability and personal development planning (PDP) are integrated into the curriculum and made relevant for the growing number of international and UK domiciled postgraduates. Taught postgraduates with first degrees from the UK are likely to have some experience of PDP, whereas international students with undergraduate degrees from outwith the UK may not; as such, more tailored PDP activities and guidance should be adopted by UK universities to take account of the different background experience of taught postgraduates.



To address the career planning aspect of PDP at the University of Aberdeen, Careers & Employability for Postgraduates - a new Level 5 taught module, was introduced in the College of Life Sciences & Medicine. This credit-bearing careers education module, developed by the University's Career Service, aims to embed careers education and employability into the MSc curriculum. This approach ensures all taught masters biology students are given an opportunity to adequately prepare for and feel confident about their prospects in the employment market or further postgraduate study. During the module students explore career planning, job applications, transferable skills development, recruitment methods and entrepreneurship.

The module is assessed by a reflective 1,000 word career planning report to facilitate students in understanding their career goals (60%) and a CV construction exercise to provide them with practical application skills (40%). Reflective writing has many potential benefits for career development learning in the module as it enables students to contextualise and make sense of new information they are acquiring rather than merely memorising facts. Students are able to ask questions and admit confusion as well as being encouraged to make connections between the different module workshops as part of the assessed reflective report.

What do Aberdeen biology MSc students think about the careers education module? Specific student post-course evaluation comments include:

*"I was initially confused about my career options, but I feel my career plans are much clearer after completing this course."*

(Post-course questionnaire quote, MSc Environmental Science student).

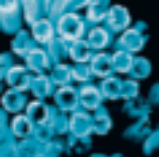
*"This course really helped me understand my personality, strengths and weaknesses and how I can market myself effectively through my CV."*

(Post-course questionnaire quote, MSc Molecular & Cellular Immunology student)

Without a doubt a major factor in this successful employability development is a commitment to embedding the module into the main stream curriculum rather than providing career workshops on a 'bolt-on' basis.

With an ever increasing number of international students opting to study a taught postgraduate qualification in the UK this module inspired a proposal for a Scottish cross-institutional PDP project to develop, pilot and evaluate innovative PDP resources and activities specifically designed for international taught postgraduates. This initiative has recently been approved by the Scottish Funding Council and is supported by the Scottish arm of the Higher Education Academy. The project will help in establishing a generic PDP framework to assist international taught postgraduates to develop a clearer understanding of the long term benefits of PDP and help them to engage with it. Given that the vast majority of international taught postgraduates hail from Asian and African countries, the need for a better understanding of their educational systems and resulting attitudes towards PDP is also required and will be investigated as part of the project. In the twenty first century international labour market the development of employability skills through understanding international perspectives is essential to the enhancement of the employment prospects of students of any nationality.

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## 6 | Teaching the 'BIO' in Microbial BIOinformatics

In recent years, the rate of DNA sequencing has increased so dramatically that determining what the sequence encodes for is now the major rate limiting step in genomics. There are simply not enough trained genome 'finishers' around. Nevertheless, these sequences are freely available via the internet for analysis and have enabled the continued expansion of 'Bioinformatics' which undergraduates and post-graduates can participate in.

My Centre for Effective Learning in Science (CELS) Centre for Excellence in Teaching and Learning (CETL) project on 'Teaching the 'BIO' in microbial bioinformatics' was the result of observing that although many of our students on a masters level course on Bioinformatics had very strong computational skills, they often lacked an appreciation of the biological significance of their findings. This imbalance was frustrating as they could miss the relevance and even overlook discoveries generated by their own studies. Instead they might be satisfied with obtaining a 'result', but might not appreciate that by pressing the right buttons on a computer program one always gets an answer, no matter what the relevance was. My goal was to assist them in realising the significance of their own DNA analysis. However to achieve this would also require them to have a greater knowledge of biochemistry and chemistry, at a time when there is a trend by students to shy away from such fundamentally important topics.

This CELS-supported project has generated a series of workshops to address these issues. They were designed for use within current modules by Level 3 undergraduate and masters level students. Online material including hypertext links to databases were made available to the students for use during workshop sessions, giving them access to the vast amount of information on the internet. The workshops were centred on interesting biological case studies which engaged the students in the learning process. The initial exercise simply introduced the students to central databases such as 'PubMed' which would give them access to journal articles and information therefore helping with other modules and research projects. This emphasised from the beginning that 'bioinformatics' and related issues is a generic tool for them during their studies and should not be pigeonholed to one module. Further exercises taught the students to search bacterial genomes for a membrane protein (nitrate reductase), which later was followed up with looking at its 3D structure. The students worked through the exercises individually. The speed with which they completed the studies varied, but by having self-analysis questions at the end of most exercises enabled the supervisor and students to check the level of understanding gained before progressing.

During the workshops the students completed an anonymous evaluation of the exercises in the modules. They were asked for their opinion on how difficult each topic was giving immediate feedback of comprehension of the material. This approach received good feedback from students who enjoyed the investigative and discovery aspect

of the exercises in the workshops. Topics which needed more lecture support were identified. It also served to demonstrate that in the world of microbial genomics you do not necessarily have the lecturer-student situation as it is impossible for any lecturer to be an expert in the hundreds of bacteria which have been sequenced to date. Instead the lecturer is more a facilitator of how students can investigate, and have ownership of their results and discoveries.

At the end of the workshops the student's ability to investigate a microbial genome was assessed by allocating each student their own organism to study. To achieve this, the students had to first research their own organism; was it Gram positive or negative? did it ferment glucose? was it pathogenic? was it a thermophile? From this foundation work the students could then predict what features would therefore be expected for their organism, and then locate relevant genes, etc on their organisms' genome. Consequently the students could work together in a general sense, but it also reduced plagiarism and collusion as each student was focused on a different microorganism with a different DNA sequence.

Building on the success of this project, it is planned that the next step will be to develop a core set of exercises to investigate different aspects of 'biofuels.' This topical issue is already covered by both undergraduate and masters level students, and will include both microbial and plant genomes, plant cell wall structure and biotechnology.

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### CETL Dissemination

The network of CETLs across England and Northern Ireland will come to the end of their HEFCE funding at the end of 2010. Throughout the existence of the 74 CETLs examples of good practice have been developed and gathered. In an effort to share invaluable and relevant CETL examples to bioscience higher education practitioners, the Centre would like ask you to send us your 'nominations' to the Centre ([heabioscience@leeds.ac.uk](mailto:heabioscience@leeds.ac.uk)). For a listing of the 12 CETLs related to the biosciences, please visit [www.bioscience.heacademy.ac.uk/network/cetl.aspx](http://www.bioscience.heacademy.ac.uk/network/cetl.aspx)

# Teaching Histology Using a Virtual Microscope: It Works Whichever Way You Slice It

The study of normal histology has for years been a core component of laboratory-based teaching for students on a range of biomedical and professional courses. In most cases this requires the availability of a large teaching space, light microscopes, glass slide-mounted histological material and staff who are able and willing to teach histology. In Bristol, until 2007, histology was routinely taught in that way in 2-3 hour laboratory practical classes to over 1000 students. The award in 2005 of the Applied and Integrated Medical Sciences (AIMS) Centre for Excellence in Teaching and Learning (CETL) has enabled us, in collaboration with our commercial partner, Slidepath (Dublin, ROI) to develop a 'virtual microscope' (VM) approach to the teaching and assessment of histology in a laboratory setting (Fig. 1).



Figure 1. Histology practical for over 100 students, supported by the virtual microscope

The VM approach was adopted as a pragmatic solution to several related problems but it also resonates with developing educational practice in terms of replacing didactic teaching in favour of self-directed learning and in taking advantage of new technologies to deliver teaching (see *Tomorrows Doctors: www.gmc-uk.org/education/index.asp*).

In recent years, the technology required to scan histological sections at high magnification and to provide access to the resultant 'virtual slides' on networked computers, via the Internet, has developed and matured (Scoville and Buskirk, 2007). Industry standard scanners for histological specimens now commonly scan entire slides at 40x, generating nearly 2x10<sup>9</sup> pixels per square centimetre, enabling users to navigate around high-resolution images at any magnification up to that used to scan the slide.

There is evidence that assessment powerfully drives learning (Bull and Stephens, 1999). In the context of histology,

assessment [summative or formative] has always been difficult and/or resource-intensive, and increased student numbers compound the difficulty. We have successfully used the VM to develop and deploy regular formative assessments (quizzes) that have been shown to engage students and provide valuable feedback to staff (Barnes and Langton, 2008). Quizzes consist of a wide variety of question types that test traditional skills of cell and tissue recognition and also aim to help students recognise the close relation between structure and function. They can be accessed during a laboratory practical and, later, off-campus for revision and further study. The same format of assessment is used in summative end of unit examinations. We have set up a demonstration area with a selection of our 'virtual slides' and a quiz readers can access with the Digital Slidebox application; this will remain visible throughout 2009; see <http://brisvm.soms.bris.ac.uk> (username: Bristol; password: aims\_vm).

In summary, our experience with the VM to date is highly positive. Nearly 1,000 undergraduates across a range of degree programmes benefit each year from its use, and their feedback on our new approach to teaching histology is very favourable. Currently, 15 members of academic staff lead histology practical classes based on 'virtual' microscopy and the following quote from a teacher is typical: "Using the VM for teaching histology really holds the attention of all of my class in a way that 'real' microscopes never did. I particularly love the fact that I can point to a cell, such as an osteoclast, on the computer screen and know absolutely that the student is seeing exactly what I am seeing."

The light microscope still has its place but, whichever way you slice it, we find the VM approach to histology teaching works.

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## 8 | Departmental Spotlight: The Discovery Zone at Leeds – an explosion of science

Picture a sports hall filled with 24 science stations, manned by over 70 research staff (PhD students right up to Professors) from the University of Leeds; a sea of colour and unusual objects, awash with enthusiastic chatter and anticipation. Crayfish in tanks are limbering up for races. Academics are pumping up airbeds to balance children on. Twelve foot models of neurones, made from ropes, balls and funnels are being tested. Plants are everywhere, forming small jungle areas interspersed with bats, insects and..... spectrophotometers! The doors open and 120 school children arrive, looking around in eager expectation at all the impending activities. The children are efficiently assigned to their stations, the staff await the onslaught, the noise levels increase and the fun begins! This is the Discovery Zone at the University of Leeds!



This two day event, kindly sponsored by a BBSRC Public Engagement Award and by a grant from The Physiological Society, enabled nearly 500 school children aged 8-14 to experience science phenomena first hand. Using models, live animals, machines, fact sheets and brain power, the pupils encountered the evolution of ant colonies, LEGO proteins, the wonders of saliva, real brains, skeletons, maths problems, insect defence systems and the importance of a healthy heart. They extracted DNA from fruit and thought about its role in humans, then made DNA bracelets. They experienced different kinds of energy and its uses. Each station provided some simple take-home messages, learnt through hands-on experiences. It is amazing how staff members managed to make intra- and intermolecular bonding relevant and understandable by making goo – the message being re-enforced beautifully by practical fun. There is nothing like the opportunity to blow things up to interest children whilst others really enjoyed learning about the exquisite sensitivity of the tips of our fingers, enabling us to read Braille and identify objects, just based on touch. In the year of a celebration of evolution, pupils learnt about adaptations of plants to enable survival by changing ways of seed dispersion.



The extremely positive feedback from University staff, accompanying teachers and most importantly the pupils, illustrates the importance of running such events at University and the rich and varied rewards. Through funding from BBSRC and The Physiological Society, transport was provided to the event, making it accessible to all schools, regardless of socioeconomic status. Many children were therefore experiencing a university setting and staff for the first time. One child described the event as a “wonderland” whilst another school reported that pupils had gone back to school buzzing so that others who had not attended organised a delegation to the headteacher to demand to be taken!

This comment from an eminent Professor who helped to run a station summed up the feelings of all the staff when he reported “This was a really great occasion, it was gratifying how many children said they really enjoyed the experiments – isolating DNA was “cool” – and several said they wanted to be scientists when they grew up!”

Overall, a success for schools, University and most importantly, science, thanks to The BBSRC and The Physiological Society.

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# Labs, Camera, Action!

**S**ocial interaction was recently highlighted by students as one of the better features of university laboratory classes (Collis et al., 2007 and Collis et al., 2008). But how do we as academics increase the learning value of these time-intensive resource-expensive teaching sessions? Often practicals are forgotten about once the class has ended and the mark has been received. How do we cause the laboratory experience to be retained longer in the mind of the student? We propose that prompting critical reflection during and after practical classes may help students to engage better with practical work, and see how the material relates to lectures and fits with the course content as a whole.

This is no mean task; however looking to popular media provided some inspiration. Video sharing on internet community sites such as YouTube and Bebo has become very popular in recent times. We have used this medium to promote critical reflection among undergraduate students as well as build a sense of community early in their academic careers and engender friendship networks within a relatively large (ca. 130 students) year one group with a broad "edu-diversity."

## Methodology

A domain name "YouTestTube.com" was registered and a video sharing website built using Vidiscript software ([www.vidiscript.com](http://www.vidiscript.com)) which allows for the uploading and sharing of videos in a manner similar to the internet video-sharing website YouTube. The site was hosted on a password protected server within the University of Ulster. Students register on the site and then request to join the chemistry practical group before they can view, rate and comment on videos. Importantly the branding, look and feel of the website provides its own identity, quite separate from YouTube, Facebook or Bebo which students often consider to be their 'social space' resenting intrusion from academics. Three video cameras were available and provided to three groups of students for each practical session. Students were asked to record their video (around 10 minutes duration) during the laboratory session, paying attention to observations made from the experiments conducted, difficulties encountered and conclusions drawn. They were also asked to reflect on how the skills gained in the key aspects of chemistry fit into their overall program of study.

## Evaluation

From an initial evaluation students appeared to have mixed feelings on making videos. Some were reluctant to take part while others readily volunteered. Some comments from students are provided below:

*"I found this site very useful and beneficial as it showed how we could have improved our practical and helped with understanding what happened in the reactions that took place."*

*"Fantastic idea! Being able to watch the practicals shows you what you need to improve on and reminds you exactly what happened in the course of the experiment. Highly entertaining, makes you want to participate and increases enthusiasm towards practicals."*

*"I really enjoyed the experience of making a video, even though when I first heard the idea I wasn't too impressed! The youtesttube site is a great way to review practicals – it's better to see it rather than reading the notes."*

The exercise was most useful as it stimulated interest and enthusiasm about a topic (chemistry) that many year 1 students find difficult. Some drawbacks were the length of time required to take video from the camera and get it uploaded to the *YouTestTube.com* site. This technical issue prevented students from doing this aspect themselves and will be addressed in the future.

While the pilot project was restricted to year 1 students taking introductory chemistry, the principle of reflective video logs could be widely transferable in other practical sessions and as a teaching tool generally. The only limitation would be the number of available cameras; but as an increasing number of mobile phones now feature video as standard this may prove to be less of a restriction in the future.

## Acknowledgements

The reflective video project was funded by JISC TechDis HEAT3 and a STAR Fellowship from the University of Ulster. We thank Olivier Riche for implementing the website and Sharon Malcolm for graphic design.

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Figure 1: Screenshot of the YouTestTube.com website



# Supporting Students

## A look at the resources for students available from the Centre

The main focus of the Centre's work is supporting the student learning experience through supporting teaching staff; however we do produce a number of resources specifically for students focussing on employability. Here we outline a selection of those employability resources and some of the other resources for students available from the Centre.

### Employability resources

The employability resources could be used in tutorial or small group settings, perhaps getting students to write and then evaluate their own or their peers CVs, or to encourage them to think about the skills they develop during their time in higher education and how to sell themselves in a CV or application form.

#### ● What does your CV say about you?

An annotated CV which takes students through a fictional CV, highlighting good and bad points and giving them hints and tips on how best to present themselves, their achievements and their experience to a potential employer.

#### ● 13 reasons why I binned your CV.

The Developed by Ian Hughes, "13 reasons why I binned your CV" brings together thirteen of the common pitfalls students can fall into when writing their CV or completing an application form, from giving old referees to not tailoring their CV to the job they are applying for.

#### ● Employability profiles.

The employability profiles outline what might be studied during a degree, highlight some of the subject specific and more generic skills students could develop and give a few ideas on where their degree could take them. Three profiles are currently available: Biosciences; Biomedical Science; and Agriculture, Forestry, Agricultural Sciences, Food Sciences and Consumer Sciences.

The profiles were adapted from the Student Employability Profiles developed by the Higher Education Academy and the CIHE (Council for Industry and Higher Education)

([www.heacademy.ac.uk/ourwork/learning/employability/links](http://www.heacademy.ac.uk/ourwork/learning/employability/links)).

All of the employability resources are available to download from the student pages of our website, [www.bioscience.heacademy.ac.uk/network/students.aspx](http://www.bioscience.heacademy.ac.uk/network/students.aspx). They are also described in a short employability leaflet which summarises all our employability resources for students, both hardcopy and online.



### Short Guides

Our series of Short Guides ([www.bioscience.heacademy.ac.uk/resources/shortguides.aspx](http://www.bioscience.heacademy.ac.uk/resources/shortguides.aspx)) aim to give an introduction to various topics in learning and teaching and complement the information available on our website. We currently have two Short Guides specifically for students.

**Advice for students starting their bioscience course** was developed following our 2007 Student Essay Competition which asked students "What advice would you give to students starting your course?" The guide brings together hints and tips from the essays for new students starting their bioscience degree. It aims to get them thinking about how to get the most out of their time in higher education, from going to lectures and developing their skills, to enjoying all the opportunities being at university or college can give.

**Postgraduate demonstrators and teachers** brings together hints and tips for postgraduate students who are demonstrating or teaching, encouraging them to think about their teaching and interactions with undergraduates, in order that both they and their students get the most out of the experience.

### Funding for students

Would your students be interested in a vacation studentship, award or conference bursary? Following the Differentiated Learning – stretching able students events in June 2007 and January 2009 the Centre produced lists of some of the summer vacation placement funding, prizes and awards and conference bursaries available from learned societies and organisations for UK undergraduate and postgraduate bioscience students. All the lists can be downloaded from [www.bioscience.heacademy.ac.uk/resources/difflearn.aspx](http://www.bioscience.heacademy.ac.uk/resources/difflearn.aspx)

All the resources described in this article can be downloaded from our website and we have a limited number of paper copies of the Employability resources and Short Guides, please contact the Centre if you would like to receive copies.

We would be interested in any comments on the resources and any ideas for future resources for students – please contact us with your thoughts!

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### Intute

Intute has published 'Internet resources for Genetics and Evolution' a 16 page online guide to the best of the Web for biological sciences. To view a copy visit [www.intute.ac.uk/healthandlifesciences/booklets/evolution.html](http://www.intute.ac.uk/healthandlifesciences/booklets/evolution.html) or to request a small number of print copies (up to 50) email the Intute Help Desk at [www.intute.ac.uk/healthandlifesciences/feedback.html](http://www.intute.ac.uk/healthandlifesciences/feedback.html) using the "Leaflets and publicity" as the 'type of request' from the dropdown menu.



# 12 | Centre News

## Open Educational Resource Initiative

We are delighted to announce the Centre has received £250,000 funding from JISC/HEA for an Open Educational Resources (OER) initiative 'An Interactive Laboratory and Fieldwork Manual for the Biosciences.' This is a pilot project which will involve collaborators from ten UK HEIs. A major aim is to deliver strategies that will enable colleagues to produce and share high quality, sustainable learning and teaching resources across the bioscience community at large. We therefore hope, in the longer term, many of you will wish to be involved with this initiative.

## Events Roundup

**Differentiated Learning - Stretching Able Students** event was held on 14th January 2009 at the University of Bristol. Visit [www.bioscience.heacademy.ac.uk/events/bristol140109.aspx](http://www.bioscience.heacademy.ac.uk/events/bristol140109.aspx) to read an event report.

**Assessing Student Learning in Work Placements** cancelled event has highlighted examples as case studies. Please visit [www.bioscience.heacademy.ac.uk/ftp/casestudies/placement/carolan.pdf](http://www.bioscience.heacademy.ac.uk/ftp/casestudies/placement/carolan.pdf) for one of the case studies.

**Creativity in the Sciences** event hosted by University of Glasgow 29th April 2009 provided examples of excellent practice to increase teaching of creativity in many different science disciplines. The event report is available at [www.bioscience.heacademy.ac.uk/events/glasgow290409.aspx](http://www.bioscience.heacademy.ac.uk/events/glasgow290409.aspx) which includes views from the day's delegates.

## Student Award Winner

The student Award 2009 winner is Susan Turrell, a postgraduate student from the University of Leeds who contributed an essay addressing the question "Given your degree, what are you looking forward to in the future?" and received £100 and an iPod touch.

Have a look at the winning, runner-up and shortlisted entries at [www.bioscience.heacademy.ac.uk/funding/essay/](http://www.bioscience.heacademy.ac.uk/funding/essay/)

## Comments Box

The Centre would love to hear your opinions and views on issues within our Bulletin.

- How do you feel regarding your own teaching status? Or the general status of teaching? Do you agree/disagree with the editorial on page 1?
- Have you had similar outreach events like on page 8 at your university or department that you would like to share?
- Do you have opinions and/or experiences around field work experiences as on page 10?

If so, please visit [www.bioscience.heacademy.ac.uk/resources/bulletin.aspx](http://www.bioscience.heacademy.ac.uk/resources/bulletin.aspx) to share your views.

# Centre Resources

## Funding

This summer the Centre will be offering £15K to support up to five individual grants in 2009. For more information and examples of successful projects from previous rounds of funding, please visit: [www.bioscience.heacademy.ac.uk/funding/tdf/index.aspx](http://www.bioscience.heacademy.ac.uk/funding/tdf/index.aspx)

## Upcoming Assessment Briefing

The Centre is publishing a briefing around the following themes on Assessment:

- Assessment of practical skills and fieldwork
- Self and peer assessment
- Question design
- Electronic assessment
- Accessible assessment
- Assessment of group work
- Formative and summative assessment
- Assessment of work placements
- Feedback – feedforward
- Assessment of PBL

Each section of the briefing will be introduced by an expert and will highlight Centre assessment resources as well as those from across the wider learning and teaching community.

## Case Studies

Looking for new ideas or ways to implement a teaching practice, then have a look at our published case studies at [www.bioscience.heacademy.ac.uk/resources/cslandt.aspx](http://www.bioscience.heacademy.ac.uk/resources/cslandt.aspx)

The Centre also continues to collect case studies around the themes of:

- Employer Engagement
- Enquiry-based Laboratory and Fieldwork
- Research-led Teaching
- E-learning-Bioscience applications of JORUM
- E-learning-Effective application of Web 2.0 technologies
- Transition to and within Higher Education

To submit a case study please visit [www.bioscience.heacademy.ac.uk/funding/cs/index.aspx](http://www.bioscience.heacademy.ac.uk/funding/cs/index.aspx)

## Bulletin 27: Summer 2009

Compiling Editor: Sheryl Meskin

To request copies of the *Bulletin* in an alternative format please contact the Centre. The *Bulletin* is printed on recycled paper.