



UK CENTRE FOR

bioscience



Event Report: Developing Laboratory Skills for the 21st Century
Tower Building
London Metropolitan University
19 May 2010

In partnership with the Centre for Excellence in Active and Interactive Learning (CEAIL) CETL

The bioscience disciplines are empirical in nature and as such the UK Centre for Bioscience believes appropriate exposure to practical work is an essential component of any bioscience degree. The educational literature clearly supports learning by doing and the benefits of practical work to the majority of students are clear. However, practical work is expensive (in terms of staff time, consumables and building costs) and in a climate of reduced unit resource practical work will come under further pressure. With this in mind, the Centre along with the CEAIL CETL and the EL CETL developed a programme to share current practices, issues and relevant research focussed on the development of key skills in the laboratory setting.

What others had to say about the event:

“Confirmation of the importance of practical work in bioscience pedagogy.”

“It is wonderful to see the great work being done in many institutions, people that are very keen to teach and share.”

“A refreshing experience which facilitated interesting ideas and was inspiring for future teaching.”

“(I want to) Incorporate information gathered today into the case I am building for lab provision at my institution.”



Centre showcase of practical work and resources

Steve Maw, UK Centre for Bioscience

Steve Maw kicked off the event by providing an overview of the Centre’s work on practical skills, a key activity for the Centre, and resulting practical work resources. He reiterated the importance of learning by doing as a philosophy central to practicals and how it provides learners with memorable connections to that learning. He suggested the Centre is uniquely placed to influence the future of practical work across the UK through involvement in a variety of different opportunities. The opportunities are three-fold: technological advances; industrial voices, & pedagogical improvements. A series of thought-provoking questions were shared with the delegates to reflect upon during the course of the day.

CEAIL (Centre for Excellence in Active and Interactive Learning) showcase of work: Supporting students in laboratory practical work: Good practices and outcomes

Karen King, CEAIL CETL & Institute of Agri-Food and Land Use, School of Biological Sciences, Queen's University, Belfast

Karen shared the work of the CEAIL CETL over the past five years on the good practices and outcomes of laboratory practicals. She identified the support for 1st year students as the



most important for student retention and knowledge/acquisition for those students. With this in mind she shared reasons for maintaining and enriching the practical experiences to include a student centred approach, providing interactive support systems, stimulating/inspiring students, and preparing students for further learning in years 2-3. All of these measures were to enhance the student learning experience. A vast

set of pre-practical support systems were implemented based on student designed practicals and provided increased support during and after the practical experiences with an emphasis on improved assessments. A list of student outcomes resulting from the measures were shared and discussed. One approach worth noting was the idea to do fewer practicals while doing a better job on the chosen few. The CEAIL CETL web pages (www.qub.ac.uk/sites/CentreforExcellenceinActiveandInteractiveLearning/BiosciencesProject/PublicationsReports/) provide further guidance on how to bring about similar changes in practical programmes.

EL CETL (Experiential Learning CETL) showcase of work (LABplus): Innovative approach to the maintenance and enhancement of laboratory and fieldwork skills

Emily Woods and Jane Yea, Experiential Learning CETL, University of Plymouth

Emily and Jane co-presented the work at EL-CETL

(www2.plymouth.ac.uk/science/elcetil/about.html) providing the delegates with an overview of the very popular programme to support lab and fieldwork at the University of Plymouth across four disciplines. Additionally they shared their own perspective of participating as a student and as employees with the EL CETL.

The CETL funds were used to develop an open access, purpose built space and set of physical resources, LABplus

(www2.plymouth.ac.uk/science/elcetil/labplus.html), which collectively helped students to extend the typical lab or field experience. Students in this setting were able to preview materials to support the lab/fieldwork, develop/enhance prerequisite skills with equipment, follow up on work after the lab/field experiences, provide a very comfortable, supportive environment for revision where students can work at their own pace. Additionally the space and materials have allowed visiting outreach groups to develop an understanding of what types of activities/work university students on such courses would experience.



Lunchtime tour of London Met's Science Centre teaching spaces

After a quick lunch, Sheelagh Heugh and Ken Hudson took the group of delegates on a tour of the massive teaching labs in the Science Centre. Here we were all properly kitted up with lab coats, goggles and headphones to receive wireless instruction from Sheelaugh in the very technologically advanced laboratory setting. In this interactive lab space Sheelaugh presented her swapshop of 'Using technology to teach microbiology techniques.' A tour of the rest of the building followed. A virtual tour of the Science Centre is available at

www.londonmet.ac.uk/depts/hhs/sc/sc_tour.cfm Additionally there was opportunity to view other work of the CEAIL CETL through different posters on display.



OER (Open Educational Resources) project: Developing an interactive laboratory and fieldwork manual

Chris Taylor, UK Centre for Bioscience

The OER culture across higher education continues to expand both in materials openly shared/refitted and in understanding/acceptance of the OER philosophy across the sector. Chris shared a historical perspective and the Centre's current subject-based work with ten different bioscience departments to develop an interactive lab & fieldwork manual. The project committed to has already developed content which has been re-fitted for use as reuseable learning objects (RLOs). Chris shared the content collected over the course of the Centre's JISC-funded project.

Facilitated discussion: Future and development of practical skills in HEIs

Dai Roberts, CEAIL CETL, Queen's University, Belfast



As a way of bringing together the examples shared during the day and reflecting on practices across the delegate's home institution and departments/schools, Dai asked the group to consider what practice(s) could be taken forward. As mentioned previously re-inventing the wheel is time consuming and duplicates existing practice without the benefit of including lessons learnt. The group discussed many different aspects on issues with lab/field work such as: open vs closed practicals; feedback – timeliness, different types, implementation of; taking examples of good practice such as those shared in the two CETL showcases into own HEI or school/department; retention; flexible learning provision; peer support/mentors; ways to teach scientific method or how science works; relevance with practicals; virtual vs real lab/fieldwork experiences and student confidence issue with practicals that more open ended.

Swapshops:

Facilitated by Sheryl Meskin, UK Centre for Bioscience

'Practical separation – do practical reports contribute to the skills gap'

Damian Parry, Liverpool Hope University, shared work with colleagues at LHU to increase engagement with practicals through changes in the taught curriculum and module. He provided the supportive data for bringing about such pedagogical changes and highlighted the importance of reflection in the laboratory setting. An important addition to their existing practice was for students to reflect on the practical prior to being assessed. To assist students with ways to analyse what worked/didn't work and why with respect to a completed practical, a Critical Incident Analysis (CIA) approach was implemented to help provide focus on the practical. The students were surveyed at the start of the intervention (students showed confusion about CIA and reflection & tutor feedback was most important tool to inform learning) and the end (increased understanding of the theory behind the science was identified as the most important attribute of a bioscientist). Overall the students worked towards good marks on their lab write-ups and saw no value in reflection or the lab process.

'Methodology videos – a new (or renewed) lease of life in relation to distance learning'

Ken Hudson, London Metropolitan University, played a series of videos he developed and recorded to support distance learning modules. The videos were made to demonstrate a certain methodology and illustrate learning by doing. He shared technological hints and tips such as the deliberate inclusion of background noises; using high resolution requires large files, etc.

Reflections

David Adams, Director, UK Centre for Bioscience, challenged the group to submit a favourite practical which could be submitted and shared across such dissemination routes as the OER. He sees the Centre as being in a favourable position to help identify and disseminate examples of good/effective practices across the UK. David understands the competition existing in current academic workloads as well as ownership issues which might outweigh perceived benefits in participating in such a public way. Inclusion of industry and groups representing industry, e.g. Sector Skills Council, will also be important in helping to identify specialist skills to inform lab/practical classes in UK higher education.

If you are interested in submitting such a practical, please contact the Centre at heabioscience@leeds.ac.uk

The Event Programme and information from speakers can be found in the Event Report at: www.bioscience.heacademy.ac.uk/events/londonmet190510.aspx