HUBS
Heads of University Biosciences

HUBS Spring Meeting Report

6 - 7 May 2015, Chicheley Hall

Assessment and Feedback in the Biosciences

Programme: Day One - 6 May

13:00-14:00 Arrival & lunch

14:00-14:05 Welcome

14:05-15:10 **HE Bioscience Teacher of the Year: Finalist Case Studies**
- Sponsored by **Oxford University Press**

- Dr Sohag Saleh (Imperial College London)
- Dr Mark Clements (University of Westminster)
- Dr Alan Cann (University of Leicester)

15:10-15:30 **Mads Bonde (Labster)**

'Improving Science Education through Gamified Laboratory Simulations'

15.30-16.00 Refreshments

Session One

16:00-16:45 **Rachael Tomkins (OCR - Cambridge Assessment Group)**

'A Level reform: assessment and feedback' with discussion

16:45-17:15 **Professor Jon Scott (Leicester University)**

'Developing a University strategy for assessment & feedback'

17:30-18:00 AGM

18:00-19:00 Poster session with wine reception

- Sponsored by **Labster**

19:00 Dinner

Programme: Day Two - 7 May

Session Two

9:15-9:45 **Dr Amanda Harvey (Brunel University London)**

'Are modules needed? A synoptic approach to assessment in Biosciences'

9:45-10:30 **Dr Alan Masson (Blackboard Inc)**

'The use of Blackboard in assessment & feedback'

10:30-11:00 Refreshments and poster session

Session Three

11:00-11:30 **Dr Jeremy Pritchard (University of Birmingham)**

'Flipped lecture delivery: It's all about the assessment'

11:30-12:00 **Dr Susanne Voelkel (Liverpool University)**

'How to provide formative assessment & feedback for large classes'

12:00-12:30 **Paul Orsmond (Staffordshire University)**

'The Sustainable Learner: how would we recognise them?'

12:30-13:30 Lunch

Session Four

13:30-14:00 **Dr David Wright (Teesside University)**

'Enhancing research proposals and project design'

14:00-14:30 **Mrs Helen Page (Teesside University)**

'Driving assessment change in group-working modules'

14:30-15:00 **Professor Jon Green (University of Birmingham)**

'Efficient assessment & feedback' with discussion

15:00-15:05 Round-up and close

15:05-15:30 Refreshments and depart

Talk Abstracts

HE BTOY Finalist, Dr Sohag Saleh – Imperial College London

'Enhancing practical teaching with patient-based, interactive, online practical sessions'

Within the medical degree at Imperial College there is a reliance on large-group teaching. Small-group practical sessions help students gain hands-on experience of vocational technical skills in an interactive environment.

To update the practical teaching we developed a range of interactive sessions utilising equipment that allowed real-time recording of the physiological parameters being measured. We focussed on four physiology practical sessions and older students were employed to develop the content.

The updated practical sessions have been integrated into courses within the Faculty of Medicine and student feedback has been very positive. A controlled study was used to evaluate the practicals, which was presented at the Physiological Society meeting (2014). Students' perceived knowledge gained was 72±1% (n= 227) compared to 61±2%, (n= 208, $p<0.001$) for the traditional practical whilst the students also felt significantly more engaged; 84±1% compared to 78±1% ($p< 0.001$) with the new practicals.

Their success stems from development utilising established pedagogic principles: content was aligned to learning outcomes; formative assessment with feedback was included and patient cases added an element of situated learning.

New practical sessions have been successfully incorporated into teaching, which significantly increased student knowledge and engagement.

HE BTOY Finalist, Dr Mark Clements - University of Westminster

'Enhancing higher education in the biosciences through co-creation'

This case study describes two co-creation approaches designed to enhance student learning within the biosciences at the University of Westminster. This is work is grounded in 'co-creation of knowledge & understanding' rather than students being passive recipients of knowledge. In the first approach mobile learning devices were used to transform the way students learnt by creating an active dynamic enquiry based learning experience. The second approach is based on a generative curriculum model for interdisciplinary collaboration and co-creation between art/ science students. Such approaches can transform the student learning experience and facilitate the development of graduate attributes required by employers to solve current and future global challenges.

HE BTOY Finalist, Dr Alan Cann - University of Leicester
'Skills development through authentic assessment'

"Authentic assessment" is relevant to real world outcomes and engaging for students. Given the lack of engagement with anything that smacks of "skills" rather than "facts" in the science curriculum, the tasks used to assess skills development tend to be a long way from the top end of Bloom's taxonomy of learning objectives. This treadmill assessment activity has little to do with what goes on in the workplace. Team-based learning represents a shift from a teacher-based strategy to a student-centred approach and requires a realignment from traditional delivery methods. The evidence is growing that team-based learning enhances student engagement. Faced with the task of developing a research skills module for nearly 300 biological sciences students, I applied principles of authentic assessment via team-based learning. Practical problems in achieving this with a large number of students include the staffing demands of this approach. There are also problems with applying performance-based outcomes to large groups of students. In spite of these issues, students on this module state that they feel better prepared for final year independent research projects and we are hopeful that these gains will translate into long term benefits at degree level and beyond.

HE BTOY Finalist, Dr Dave Lewis – University of Leeds
'Students as Partners: Extracurricular opportunities to enhance student learning in the Biosciences'

Please note: Dr Dave Lewis was unable to attend the Spring Meeting and therefore did not present this talk.

The considerable benefits to be gained when students work in partnership to enhance both their own, and their peers, learning experiences cannot be underestimated (Healy *et al*., 2014). Further, the CBI/NUS report "*Future fit*" (2011) recommended that universities provide more opportunities, both within and outside of the taught curriculum, for students to contribute to their education.

Three extracurricular partnership opportunities were developed: an educational research internships scheme, where students work collaboratively with staff on ongoing curriculum development and pedagogical research projects; *Pop-up science*, a student-led public engagement volunteer scheme, where students work in partnership with their peers to create and deliver activities at local community fetes and family fun-days which engage the public with science; MSEDG, a student-led ethics discussion group where students meet to discuss and debate topical ethical issues in science with their peers. Student engagement with and participation in these activities was substantial; they significantly enhanced their learning experience, provided valuable work experience and the development of key employability skills.

These interventions demonstrate that student partnerships are an invaluable and highly effective way of engaging and involving students in their education and learning journey. Further, they can be developed across the entire spectrum of HE activities.

Mads Bonde - Labster
'Improving Science Education through Gamified Laboratory Simulations'

Traditional teaching methods continue to dominate science education, but new IT-based approaches such as simulations provide an opportunity for increasing learning outcomes and motivation for students.

Labster have developed an advanced laboratory simulation platform, based on mathematical algorithms supporting open-ended investigations and combined with gamification elements such as an immersive 3D universe, storytelling, conversations with fictional characters and a scoring system (see www.labster.com). The laboratory simulations are now used at globally including at leading universities such as MIT, Harvard and Stanford University.

A group of psychologists and life science researchers recently published a study in Nature Biotechnology (July, 2014), and showed a 76 % statistically significant increase in learning by using the Labster simulation compared with traditional teaching and a 101 % increase when used in combination.

Tools like Labster provides unprecedented possibilities of live assessment and feedback, that makes it possible for teachers to track students, find out more about their level and give feedback individually and to the class as a whole. These new tools give the possibility of using continuous students assessment to improve course delivery, and to identify students with increased risk of dropping out, as a recent pilot study at Copenhagen University is suggesting.

Rachael Tomkins - OCR, Cambridge Assessment Group
'A level reform: assessment and feedback' with discussion

A Level reform: Changes to the specifications and the assessment of practical skills. OCRs model for the Practical Endorsement and the opportunities that this presents for a wide and varied practical experience.

Professor Jon Scott - Leicester University
'Developing a University strategy for assessment & feedback'

Developing a University Strategy for Assessment & Feedback Assessment and feedback remain a focal point for improvement as indicated by the persistence of relatively low scores in surveys such as the NSS. Whilst the onus is often placed on departments to enhance their practice, it is clear that a co-ordinated institutional approach, involving collaboration between staff and students, is also essential. This presentation will reflect on the experience of developing such a strategy within one university and the approaches adopted.

Dr Amanda Harvey - Brunel University London
'Are modules needed? A synoptic approach to assessment in Biosciences'

The packaging of teaching and assessment into modules encourages an in silo approach to learning with students often not seeing or appreciating the broader themes that link the different subject areas. In addition it is possible to have an over reliance on testing similar skills; for example a practical class is often assessed by means of a conventional written practical report with a standard format (introduction, methods, results and discussion) and an individual student's experience of different assessment methods can be dependent on their module choices.
The approach taken at Brunel aims to address these issues by removing modules and delivering teaching and assessment in separate blocks. Our overarching and more synoptic style approach to assessment means that all students complete the same assessments, and are encouraged to draw links between different subjects and develop the skills required for future employment.

Dr Alan Masson - Blackboard Inc
'The use of Blackboard in assessment & feedback'

This hands-on interactive session will use recognised principles of assessment and feedback to articulate an aspirational assessment and feedback model / strategy which is informed by course student feedback and University policies and agendas. This session will then explore, identify and design patterns of Blackboard tools / features that can deliver the identified assessment and feedback vision.

Dr Jeremy Pritchard - University of Birmingham
'Flipped lecture delivery: It's all about the assessment'

This talk will outline experiences of using lecture recordings to facilitate flipped teaching to 70 students in the school of Biosciences at the University of Birmingham. There is increasing acceptance that face-to-face time with students should not be wasted on knowledge transfer and that there is a greater need to deliver transferable skills. I used previously recorded lectures to flip part of a final year module. Since students engage better through assessment, the novel teaching delivery was accompanied by student-led development of a seen exam question. In the first year student perception was mixed, with a small cohort uncomfortable with less didactic delivery. The second year delivery was more structured and clearer about the objectives, with in-depth discussion of the development of the seen exam question and the front loaded independent learning. The Canvas VLE was used to facilitate peer and group work. Flipped delivery was varied, including lecture recordings, journal clubs, outside speakers and presentations. Despite the structure and transparency, student engagement in the flipped lecture remains an issue. However, students performed better in this component of the module and anecdotal feedback suggested post-exam acceptance of the aims. The 2015-15 results and the outcomes of a post exam focus group ar being undertaken but will not be available at the meeting. The presentation will conclude with a presentation of lessons learned and recommendations for future.

Dr Susanne Voelkel - Liverpool University
'How to provide formative assessment & feedback for large classes'

It is well established that students learn better when they have plenty of opportunity for formative assessment combined with high quality feedback. However, large classes can make it difficult to ensure this. In-class polls using PollEverywhere provide the opportunity for students to test their knowledge and understanding and enable lecturers to immediately recognize and respond to misunderstandings. Formative assessment can also be provided through online test, but participation rate is often low. Two-stage tests allow the combination of formative with summative tests, ensuring high completion rates and providing immediate formative feedback. Both, in-class polls and two-stage online tests are very popular with students and can improve student learning.

Paul Orsmond - Staffordshire University
'The Sustainable Learner: how would we recognise them?'

In this talk I will explore (i) the possible characteristics the sustainable learner may have (ii) show that in terms of responding to feedback high-achieving students are sustainable learners and (iii) explore characteristics of the sustainable learner in terms of self-assessment.

Dr David Wright - Teesside University
'Enhancing research proposals and project design'

In an effort to embed a student focused approach to research informed teaching, and better prepare students for their final year hypothesis-driven project, the School of Science & Engineering established a specific link between the second year module Science Research Proposal and the final year module Science Research Project. In Science Research Proposal, students produce a research proposal based on the forms used by scientists applying for research council support. The proposal contains details of the project targeted at a specialist audience and the general public. In addition, students summarise the likely impacts, apply for ethical clearance and consider the financial implications of their project. In the final year, rather than the traditional dissertation, science students are required to submit their findings, initially, in the form of a poster and, subsequently, as a journal article. The School's Poster Day, typically brings together students, academic staff and invited External Examiners. The day is accompanied by an abstract booklet and thus, pre-event and event activities mimic the environment experienced at a scientific conference. Submission of their work in the form of an academic paper in the style of a scientific journal is the final step in ensuring students develop their communication skills and understanding of the requirements placed on a professional scientist. The adoption of this approach has encouraged and facilitated students to disseminate their work at external events or via publication in journals, such as those which specialise in publishing undergraduate work.

Helen Page - Teesside University
'Driving assessment change in group-working modules'

The School of Science and Engineering (SSE), at Teesside University, took part in the Higher Education Academy (HEA) funded Transforming Assessment Pilot Scheme (TAPS) project, which reached its conclusion in May 2014. This presentation aims to explore the main outcomes of our engagement with the TAPS project: the benefits of dialogic assessment methods in group-working modules and the impact of the student voice in the decision-making process of programme changes.

SSE set out to use TAPS to help improve assessment following a strategic decision to place group-work and problem-based learning at the centre of every programme within the School. Our main aim, based on staff and student feedback, was to increase the actual and perceived reliability of assessing individual contributions to group-work problems. We found that a dialogic assessment mechanism, utilising technical group interviews followed by individual reflective interviews, was a suitable tool in this instance. The interviews were tailored to assess individual levels of understanding of the process – from factual recall to deeper, thorough understanding.

Evaluation from the students suggested an increase in perceived fairness: the students felt the quantity and quality of their contribution could be ascertained, and the individual interviews provided the opportunity to further support and evidence their distinct contributions to the group working process.

The positive, empowering relationship formed between staff and students was also a beneficial outcome. Embracing student involvement as an integral part of the design/re-design/evaluation stages of change was essential for informed curriculum design, increased student satisfaction and for the students to be seen as 'partners' within the process.

Professor Jon Green - University of Birmingham
'Efficient assessment & feedback' with discussion

Setting assessments and providing timely and useful feedback to students can often require large investments of time, especially for classes that may be in excess of 250 students. This is particularly challenging for staff in institutions with a major focus on research. This session will explore strategies that can be used to ensure we don't over-assess students and also that can help staff to use time effectively to provide feedback on students' work.

1. Posters

Development of common feedback grids for use in summative work.

Alison K Cross and Katherine Rawlinson - *Sheffield Hallam University*

Evaluation of student performance in online practical work.

Mark C. Hirst and Hilary A. MacQueen - *The Open University*

Informative, expressive and encouragingly honest: A tale of 3 assessment and feedback methods.

Michael Loughlin - *Nottingham Trent University*

Developing critical analysis in undergraduate dissertations through formative feedback.

Adam J. W. Paige and Nicholas Worsfold - *University of Bedfordshire*

The use of structured interpretative questions for assessment of a distance learning module.

Sandra Kirk and Luigi De Girolamo - *Nottingham Trent University*

Delivery of module-specific assessment and feedback through small-group course tutorials.

Rachel Stubbington - *Nottingham Trent University*

Science research proposal and research project.

David Wright and Helen Page - *Teesside University*

Delegates

Title	First name	Surname	Affiliation
Dr	Anthony John	Baines	University of Kent
Professor	Christopher	Baldwin	Newcastle University
	Mads	Bonde	Labster
Dr	Alan	Cann	University of Leicester
Dr	Mark	Clements	University of Westminster
Professor	David	Coates	University of Dundee
Dr	Lisa	Coneyworth	University of Nottingham
	Sarah	Cox	Society of Biology
	Maaroof	Fakhri	Labster
Dr	Maurice	Gallagher	University of Edinburgh
Professor	Jon	Green	University of Birmingham
Dr	Amanda	Harvey	Brunel University London
Professor	Janey	Henderson	Teesside University
Dr	Sally	Hicks	Cardiff Metropolitan University
Dr	Sue	Jones	York St John University
	Jim	Khambatta	Diagenics Ltd
Professor	Sandra	Kirk	Nottingham Trent University
Dr	Susan	Laird	Sheffield Hallam University
	Rachel	Lambert-Forsyth	Society of Biology
Professor	Andrew	Lawrence	University of Chester
Professor	Jane	Lewis	University of Westminster
Dr	Judith	Lock	University of Southampton
Professor	Paul	Lynch	University of Derby
	Nicholas	Lynch	Diagenics Ltd
Professor	Hilary	MacQueen	Open University
Dr	Alan	Masson	Blackboard, Inc
Professor	Gerry	McKenna	HUCBS
Dr	James	Moir	University of York
Dr	Arthur	Nicholas	University Bioscience Managers' Association (UBMA)
Dr	Paul	Orsmond	Staffordshire University
Dr	Helen	Page	Teesside University
Dr	Adam	Paige	University of Bedfordshire

Professor	Julian	Park	University of Reading
Dr	Michelle Amy	Pinard	University of Aderdeen
Dr	Angela	Priestman	Staffordshire University
Dr	Jeremy	Pritchard	University of Birmingham
Dr	Jim	Ralphs	Cardiff University
Professor	Graeme	Reid	University of Edinburgh
	Dan	Rowson	Society of Biology
Dr	Sohag	Saleh	Imperial University
Professor	Jon	Scott	Leicester University
Professor	Judith	Smith	University of Salford
Dr	Karen	Stanley	Sheffield Hallam University
Dr	Rachel	Stubbington	Nottingham Trent University
	Rachael	Tomkins	OCR, Cambridge
Dr	Susanne	Voelkel	Liverpool University
Dr	Richard	Waites	University of York
Dr	Peter	Watkins	Cardiff Metropolitan University
Dr	Joy	Watts	University of Portsmouth
Dr	Nicholas	Worsfold	University of Bedfordshire
Dr	David	Wright	Teesside University