



Heads of University Biosciences

HUBS Spring Meeting Report

10 - 11 May 2017

**Digital Teaching and Learning in
the Biosciences and Bioethics**

Chair's Introduction

Thank you to all those who joined us at the HUBS Spring Meeting 2017 in Leicester. Academics from across the UK came to hear talks from our speakers on '*Digital Teaching and Learning in the Biosciences*,' '*Bioethics*' and '*Current Issues in Higher Education*.'

The conference was packed with talks and networking opportunities, other highlights included the presentation of posters, hearing the inspiring case studies from the Higher Education Bioscience Teacher of the Year finalists and the HUBS Annual General Meeting (AGM).

At the HUBS AGM, Professor Graham Scott and Dr Angela Priestman were officially elected to the HUBS Executive Committee. Two long-standing members of the Committee also stepped down, Professor Peter Heathcote and Professor Graeme Reid. I would like to thank Peter and Graeme for all their support during their time on the HUBS Executive Committee. We now currently have two vacancies on the Committee, which we will circulate details of to all our members.

Looking back, it has been a busy and exciting year so far for HUBS. HUBS have awarded three grants of up to £1000 to HUBS members to run free workshops on teaching and learning in the biosciences. The winner of the HE Bioscience Teacher of the Year Award was announced at the HUBS Spring Meeting and HUBS continue to support this award. The winner, Dr Ian Turner from the University of Derby, was recognised for his outstanding and innovative teaching style. HUBS also launched an Early Career Lecturers Forum at the start of the year. The group is comprised of early career staff working in HUBS member institutions, who will focus on the key issues for early career lecturers in the biosciences.

HUBS members continue to represent the sector and have fed into a number of Royal Society of Biology policy consultations, including those on the Research Excellence Framework, the Teaching Excellence Framework, accelerated courses and switching degrees and the impact of exiting the European Union on the higher education sector, science and research.

Finally, we are delighted to announce that the HUBS Winter Meeting 2017 will be held at the Natural History Museum on 16th November 2017. We look forward to seeing you there and continuing our active engagement with higher education and the biosciences.



Sandra Kirk

Dr Sandra Kirk FRSB
Chair of Heads of University Biosciences (HUBS)

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1. About the Heads of University Biosciences (HUBS)

The Heads of University Biosciences (HUBS) membership comprises 80 higher education institutions in the UK, represented by biological and life science heads of departments and subject leads. HUBS provides a forum for discussing national issues on the provision of research and teaching in the biosciences, and as a source of informed comment on the consultations that affect HE institutions delivering in the biological and life sciences. HUBS is a Special Interest Group of the Royal Society of Biology. www.rsb.org.uk/HUBS

HUBS Member Institutions

University of Aberdeen	Glasgow Caledonian University	Queen Mary, University of London
University of Abertay	University of Greenwich	University of Reading
Aberystwyth University	Heriot-Watt University	Roehampton University
Anglia Ruskin University	University of Hertfordshire	Royal Holloway
Aston University	University of Huddersfield	University of Salford
University of Bath	University of Hull	University of Sheffield
University of Bedfordshire	Keele University	Sheffield Hallam University
Birmingham City	University of Kent	University of Southampton
University of Birmingham	King's College London	University of St Andrews
University of Bolton	Kingston University	Staffordshire University
University of Brighton	University of Lancaster	University of Surrey
Brunel University London	University of Leeds	University of Sussex
Cardiff Metropolitan University	Leeds Beckett University	Swansea University
Cardiff University	University of Leicester	Teesside University
University of Chester	University of Lincoln	University of the West England
University of Cumbria	University of Liverpool	University of the West of Scotland
University College London (UCL)	Liverpool John Moores University	University of Ulster
Coventry University	University of Manchester	University of Warwick
University of Derby	Manchester Metropolitan University	University of Westminster
University of Dundee	Middlesex University	University of Wolverhampton
University of Durham	Newcastle University	University of Worcester
University of East Anglia	Northumbria University	University of York
University of East London	Nottingham Trent University	York St John University
University of Edinburgh	Open University	Zoological Society London
Edinburgh Napier University	Oxford Brookes University	
University of Essex	Plymouth University	
University of Exeter	University of Portsmouth	
University of Glasgow		

2. HUBS Executive Committee

Chair

Dr Sandra Kirk FRSB

Secretary

Professor Janey Henderson CBIol CSciTeach FRSB

Treasurer

Professor Paul Lynch

Members

Professor Julia Buckingham RFSB
Professor Graham Scott FRSB
Professor Andrew Lawrence FRSB
Professor Peter Heathcote FRSB
Professor Jonathan Green MRSB
Professor Graeme Reid FRSB
Professor Jonathan Scott CBIol FRSB
Professor Hilary MacQueen FRSB
Professor Peter Heathcote FRSB
Dr Angela Priestman

Secretariat

Eleanor Kirby-Green MRSB

Observers

Sarah Dalmedo CSciTeach MRSB
Laura Bellingan FRSB

3. Agenda

Day One - 10 May

12:30-13:30 Arrival & lunch

13:30-13:35 Welcome

13:35-14:45 **HE Bioscience Teacher of the Year: Finalist Case Studies**

Sponsored by 

- Dr Sarah Gretton (University of Leicester)
- Professor Kevin Moffat (University of Warwick)
- Dr Ian Turner (University of Derby)

14.45-15.10 Refreshments

Session One – Digital Teaching & Learning in the Biosciences

15:10-15:50 **Professor Stephen McClean (Ulster University)**

'Interactive technologies to enhance learning and teaching in the biosciences'

15:50-16:30 **Dr Gus Cameron (University of Bristol)**

'Lab practicals – making the most of what you've got: online, offline and in-between'

16:30-17:00 **Sam Butcher (Labster)**

'Enhancing the student experience in bioscience with gamified virtual labs'

17:00-17:10 Refreshments

17:10-18:00 **HUBS AGM**

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

19:00 Dinner

Day Two - 11 May

Session Two – Digital Teaching & Learning in the Biosciences

9:00-9:30 **Dr Alice Mauchline (University of Reading)**

‘Enhancing fieldwork learning using mobile devices’

9:30 -10:00 **Dr Trevor Collins (Open University)**

‘Integrating accessibility into digital approaches’

10:00-10:30 **Discussion Session**

‘How can we teach digital teaching and learning in the biosciences?’

10:30-11:00 Refreshments

Session Three – Bioethics

11:00-11:30 **Dr Chris Willmott (University of Leicester)**

‘Why teaching of bioethics matters’

11:30-12:15 **Professor John Bryant (University of Exeter)**

‘The science and ethics of CRISPR (Gene Editing Technology)’

12:15-13:00 **Discussion Session**

13:00-13:45 Lunch

Session Four – Current Issues in Higher Education

13:45-14:15 **Dr Orla Kennedy (University of Reading)**

‘Apprenticeships’

14:15-15:00 **Professor Jon Scott (University of Leicester)**

‘Update: Teaching Excellence Framework’

15:00 Meeting close

4. Higher Education Bioscience Teacher of the Year Award



About the Award

The Higher Education (HE) Bioscience Teacher of the Year Award seeks to identify the UK's leading bioscience HE teachers and recognises the invaluable role they play. The competition is open to all employed bioscience teachers in the UK HE system and individuals can be nominated either by self, peer or management nomination using a quick nomination form.

The scheme rewards lecturers who:

- Display individual excellence through the design and development of approaches to teaching that have proven successful in promoting bioscience student learning and achievement
- Undertake scholarly and professional developmental activities that actively influence and enhance the learning of their students
- Support colleagues and influence bioscience student learning beyond their own department and institution
- Exhibit innovation in relation to teaching that has proven to improve teaching practices and enhance student learning

Posters advertising the 2018 Award will be available to take back to your institution.

2017 Finalist case study presentations: 10th May

Congratulations to the three finalists of this year's Award. Each will give a case study presentation that they delivered during the second round of judging. Following each case study presentation there will be a short time for discussion and questions. The overall winner of the award will be announced for the first time at the dinner.

The 2017 Finalists are as follows:

Dr Sarah Gretton (University of Leicester)

Professor Kevin Moffat (University of Warwick)

Dr Ian Turner (University of Derby)

5. Speaker biographies and talk abstracts

We would like to take the opportunity to say a huge thank you to all our speakers for their valuable contribution to the conference.

Dr Sarah Gretton (University of Leicester) HE Bioscience Teacher of the Year Finalist



Dr Sarah Gretton trained as a virologist, working on hepatitis C virus as a PhD student and as a research fellow. In 2010, after a brief period as a sessional lecturer, she joined the University of Leicester as a teaching fellow, working on educational research projects in the Genetics Centre for Excellence in Teaching and Learning and teaching on the Natural Sciences undergraduate programme. She coordinated the biology curriculum on the Natural Sciences course for four years before being appointed as Programme Director in 2015. Sarah is a Senior Fellow of the HEA and holds a Distinguished University Teaching Fellowship award. She led a finalist entry for the 2016 HEA Collaborative Awards for Teaching Excellence. Sarah's interests include Education for Sustainable Development and reward and recognition for teaching-focused academics. Her case study focuses on her work using real-world interdisciplinary science problems with Natural Sciences students.

Professor Kevin Moffat (University of Warwick) HE Bioscience Teacher of the Year Finalist



Professor Kevin Moffat graduated with a degree in Physiology and Biochemistry from the University of Reading. In 1986 he completed a Ph.D. at the then Cranfield Institute of Technology working on *Escherichia coli*. Following post-doctoral work in Australia and in the UK he gained a lectureship at the University of Warwick. In 2005 he was awarded the Warwick Award for Teaching Excellence, for his work leading on teaching innovations in the department and organising student placements. More recently he became a Senior Fellow of the Higher Education Academy and a Founding Fellow of Warwick's new International Higher Education Academy. He currently leads and teaches on several biomedical-related courses across all four years of the undergraduate curriculum, and teaches on cross-disciplinary courses for non-science undergraduate students. From 2008 to 2011 he held major teaching administrative positions in the department and now leads the School of Life Science's outreach activities.

Dr Ian Turner (University of Derby)
HE Bioscience Teacher of the Year Finalist



Dr Ian Turner is a Senior Lecturer and Deputy Head of the Department of Natural Science at the University of Derby. Ian is a passionate advocate of learning and teaching and was named National Teaching Fellow in 2015 in recognition of this. He teaches a broad range of subjects including; genetics, molecular biology and science communication, and enjoys the challenge of engaging large lecture theatres full of students. His pedagogic research interests are around innovative teaching and assessment, and more recently the use of gamification in Higher Education. Ian believes the passion educators' display correlates to the engagement and achievement of their students. He is particularly keen on the teaching approach coined 'lecture theatre pantomime' a style based on a more kinaesthetic and active ethos. His case study offers ways that this style can be incorporated into teaching.

Professor Stephen McClean (Ulster University)



Talk: Interactive technologies to enhance learning and teaching in the biosciences

Active and collaborative learning provide distinct advantages for students in higher education yet can often be hampered by the barrier of large class sizes. A number of technology solutions now exist which encourage active learning during lectures and collaborative and peer learning outside of scheduled sessions. A bring-your-own-device (BOYD) culture combined with cloud-based audience response systems help in moving the traditional lecture from a didactic format to a more discursive and interactive learning experience. This session will focus on one of the cloud based audience response tools, Nearpod for enhancing interactivity in lectures and describe ongoing practice at Ulster University with pharmacy and bioscience students where polls, open-ended questions and drawing activities are used to engage students. Collaborative digital tools to engage students in their learning are rapidly evolving. We will consider the use of PeerWise, an online collaborative tool where students create and share multiple choice questions relevant to their course of study. Students answer, rate and comment on questions set by peers and "follow" authors who make high quality contributions. As students interact with PeerWise they build up a reputation score and earn badges thus providing an element of gamification and incentive for engagement.

Dr Gus Cameron (University of Bristol)



Talk: Lab practicals – making the most of what you’ve got: online, offline and in-between

Digital technologies can boost laboratory-based learning in the biomedical sciences by i) helping to prepare students in advance of practical sessions, ii) reducing the administrative and marking burden associated with labs and iii) allowing students to revise and practice online. In the near future advances in technologies such as virtual reality, robotics and artificial intelligence may allow almost all of the ILOs associated with practicals to be realised in a purely digital space. But what can be done now? Where are limited resources best deployed and which have the biggest impact? Factors that contribute to undergraduate achievement in experimental science will be examined and technologies, pedagogical interventions and effective methods of implementing cultural change in both academic staff and students will be discussed.

Sam Butcher (Labster)



Talk: Enhancing the student experience in bioscience with gamified virtual labs

Labster's virtual lab simulations are now being used in over 25 universities in the UK. This talk will cover how some of these universities, and others around the world, have used virtual labs to improve the student experience and their key learnings from implementing this type of teaching tool in their bioscience courses. Published studies into the use of virtual labs, utilisation of VLEs, assessment and examples of best practice from around the world will be covered in this talk and an update on the latest developments in virtual labs will be given to the group; including their use in online courses and MOOCs, the utilisation of virtual reality, simulation builder software and adaptive learning platforms.

Dr Alice Mauchline (University of Reading)



***Talk: Enhancing fieldwork learning using mobile devices
Dr Alice Mauchline & Professor Julian Park (University of Reading),
Derek France & Katharine Welsh (University of Chester),
Brian Whalley (University of Sheffield)***

Fieldwork is a key component of undergraduate degree programmes in Bioscience and Geography, Earth & Environmental Sciences (GEES) disciplines. Fieldwork can be an expensive component of a departmental budget and it is important to ensure that the learning experience is used to its full potential. Many practitioners in these disciplines believe that the field experience has great benefits in relation to learning subject specific skills, various

generic skills (for instance group work) and for providing a valuable social context for relationship building between students and staff. All of these learning experiences can be enhanced through the innovative use of mobile technologies. This presentation will draw upon the 'Enhancing Fieldwork Learning' project and will showcase how technology has been successfully applied, through case study examples from our network of colleagues, to provide active learning opportunities.

Dr Trevor Collins (Open University)



Talk: Integrating accessibility into digital approaches

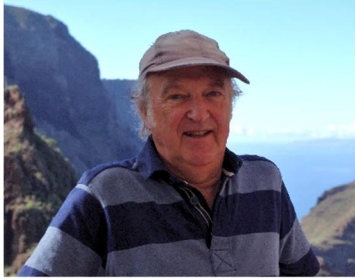
Integrating accessibility within teaching and learning requires universities to embed and sustain course design and delivery practices that consider the diverse needs of all students. As more of our teaching and learning is being mediated through technologies, this brings opportunities as well as potential pitfalls when it comes to inclusive education. For example, digital access to learning resources introduces opportunities for the use of assistive technologies and alternate formats that can enhance accessibility for students with visual and hearing impairments, and for students with specific learning difficulties. Particularly for students with disabilities, practical lab work and fieldwork, can be challenging to engage with and participate in. Within this presentation we'll explore some of the digital approaches used within The Open University to consider the needs of students with disabilities, and we'll discuss how case studies and recommendations for inclusive practices might be produced and shared across the STEM disciplines.

Dr Chris Willmott (University of Leicester)



Talk: Why teaching of bioethics matter

The frontiers of discovery in bioscience continue to push forward at an astounding pace. As a consequence the gulf between the scientific knowledge anticipated for a first year student and the cutting edge of the discipline grows ever larger. In attempting to bridge this chasm the curriculum gets ever more crowded. Surely there isn't time to waste on ethics and philosophy, is there? In this session I will put a case that some consideration of bioethics and the implications of biology for wider society is essential.



Professor John Bryant (University of Exeter)

Talk: The science and ethics of CRISPR (Gene Editing Technology)

Methods for editing genomes have been available for several years but the system based on a bacterial anti-viral defence mechanism, namely CRISPR-Cas9, is more versatile and easier to use than other methods. Specific sequences in genomes are readily targeted for removal after which the DNA may be repaired by end-joining or by insertion of a replacement sequence. The method is widely used in gene knock-out in research and is also finding applications in medicine and agriculture. Possible future uses include gene replacement in human embryos, thus altering the genome of a future human being, including the germ-line. Like all methods of genetic modification, ethical issues are raised by gene editing, some of which arise from the relative ease with which the procedure may be carried out, including its possible use in 'garage' or 'kitchen science.'

Dr Orla Kennedy (University of Reading)

Talk: 'Apprenticeships'



Degree apprenticeships are part of central government policy; launched by the coalition government in March 2015 and are outlined further in the White Paper, *Success as a Knowledge Economy: Teaching Excellence, Social Mobility and Student Choice (BIS 2016)*, which states that '*We have introduced Degree Apprenticeships to help employers get the skills they need at the highest level to increase productivity in their businesses. Employers will want to make use of the apprenticeship levy across a range of qualifications up to and including bachelor's and master's Degree level*' (p52, para 22).

Degree apprenticeships are models that combine university study and workplace learning to gain a Level 6 or Level 7 qualification. In this talk, Orla will provide an overview of the key features of Degree Apprenticeships, the development of Apprenticeship Standards to date, changes to the funding landscape including the Apprenticeship Levy and talk about the work that Reading has been doing in this area, with lessons that they are learning along the way.

6. Teaching and Learning Workshops 2017

30th June 2017

HUBS, HUCBMS and IBMS joint workshop: Teaching maths to biologists using non-digital games

HUBS, HUCBMS and IBMS are jointly sponsoring a workshop on improving the teaching of mathematical skills and physicals science within bioscience courses. This hands-on workshop will examine how non-digital games can help teach maths to biologists.

Location: University of Sheffield

Contact: Rebecca Barnes (r.barnes@sheffield.ac.uk)

19th July 2017

HUBS workshop: Learning through play and games

This workshop will focus on learning through games and play in the biosciences and will introduce the theory of gamification and play mechanics.

Location: University of York, Department of Biology

Register to attend this workshop by emailing biol-btle@york.ac.uk

Special thanks to our sponsor, who helped make the HUBS Spring Meeting 2017 event possible:

LABSTER

The event has been organised by **Professor Jon Green** (University of Birmingham) and **Professor Julian Park** (University of Reading), with support from **Eleanor Kirby-Green** (Royal Society of Biology)