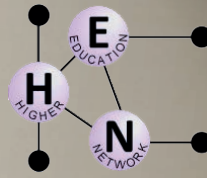


HIGHER EDUCATION NETWORK
ANNUAL MEETING 2017



The
Geological
Society

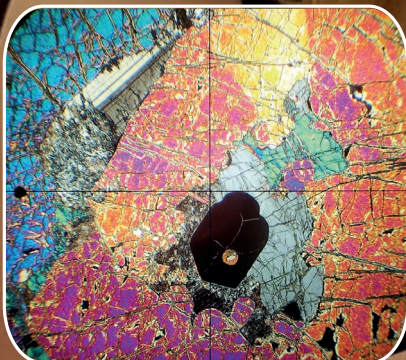
servicing science & profession

Teaching excellence in the geosciences

Tuesday 17 January 2017

The Geological Society, Burlington House, London

ABSTRACT BOOK

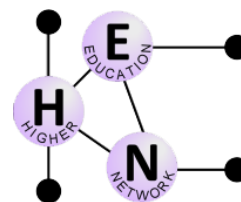
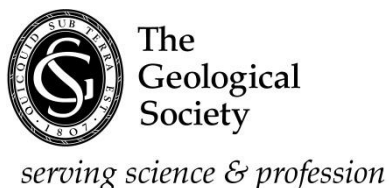


Web: www.geolsoc.org.uk/HEN17

Twitter: [#HENetwork17](https://twitter.com/HENetwork17)

CONTENT PAGE

Conference programme	Pages 2-3
Oral abstracts (in programme order)	Pages 4-23
Poster abstracts	Page 24
Fire safety information	Page 25
Burlington House floor plan	Back page



GSL Higher Education Network Annual Meeting: Burlington House, London

'TEACHING EXCELLENCE IN THE GEOSCIENCES'

Programme for Tuesday 17 January 2017:

- | | |
|-------|--|
| 09.30 | Registration opens |
| 09:55 | Welcome and introduction
<i>Nic Bilham (Director of Policy and Communications)</i> |
| 10.00 | FIRST KEYNOTE: Subject-based learning & teaching development and innovation: the impact of the Higher Education & Research Bill, the Teaching Excellence Framework and other changes to the HE landscape
<i>Helen King (HEFCE)</i> |
| 10:40 | Student measures of teaching excellence and teacher esteem in a research intensive university: the students' value economy in a TEF world
<i>Mike Streule (Imperial College, London)</i> |
| 11.00 | COFFEE |
| 11.20 | GeoLab: Shared Digital Learning Resources for Petrology
<i>Ronan Hennessy (University College Cork)</i> |
| 11.40 | Scratching the Surface: striving for excellence in public engagement with geoscience through 'virtual guided walks'
<i>Geraint Owen (University of Swansea)</i> |
| 12.00 | Teaching basic field skills using screen-based virtual reality landscapes
<i>Jacqui Houghton (University of Leeds)</i> |
| 12.20 | LUNCH AND AGM |
| 1.30 | SECOND KEYNOTE: Improving the employability of our geoscience graduates (including group discussions)
<i>Gordon Curry (University of Glasgow)</i> |
| 2.30 | Improving scientific writing in undergraduate geosciences degrees through peer review
<i>Lorraine Craig (Imperial College, London)</i> |
| 2.50 | Integrating first year geoscience bachelor students in academia
<i>Rie Malm (University of Oslo)</i> |
| 3.10 | COFFEE |

- 3.30 Lost in the fog: the importance of liminality and authenticity in learning tasks
Emma Passmore (Imperial College, London)
- 3.50 Flipping problem maps: bane or benison?
Tom Argles (Open University)
- 4.10 Summing up, close of talks programme
- 4.20 William Smith map and library tours, followed by drinks reception
- 5.30 End of event.

POSTER

Learning with the Lapworth Museum of Geology *James Wheeley (University of Birmingham)*

ORAL ABSTRACTS
(in programme order)

FIRST KEYNOTE

Subject-based learning & teaching development and innovation: the impact of the Higher Education & Research Bill, the Teaching Excellence Framework and other changes to the HE landscape

Helen King, HEFCE

Higher education has always been a dynamic environment, however, the recent Government White Paper and subsequent Higher Education & Research Bill have instigated major changes in the sector with implications for teaching and research. This presentation will highlight some of the key issues as they relate to learning and teaching including the Teaching Excellence Framework (TEF), and the transition from the Higher Education Funding Council for England (HEFCE) to the Office for Students (OfS). Other relevant changes in the sector will also be explored including the UUK review of UK higher education sector agencies (<http://www.universitiesuk.ac.uk/news/Pages/working-group-higher-education-sector-agencies.aspx>) which is due to report this month. The potential implications of these changes for institutions, disciplines (particularly GeoScience) and individuals will be discussed as well as a consideration of the role of professional & statutory bodies (such as the Geological Society).

Biography

Helen King has recently joined HEFCE as a Senior Higher Education Policy Adviser working in the Learning & Teaching Policy team. Her main responsibilities include supporting the small-scale 'Catalyst' innovation projects, publication of teaching qualifications data, development of TEF indicators (including supporting subject-level TEF) and considering HEFCE's strategy for learning & teaching development as it moves into the Office for Students. Her background is in the geosciences, including a PhD from the University of Liverpool, and from 1996 to 2007 she led national initiatives in geoscience academic development (the Earth Science Staff Development project and the HEA Subject Centre for Geography, Earth & Environmental Sciences). She has particular interests in discipline-based educational development, characteristics of expertise in learning & teaching, and linking teaching & research. She was a founding member of the Geological Society's Higher Education Network and is delighted to have the opportunity to revisit Burlington House and meet with geoscience education colleagues old and new.

NOTES

Student measures of teaching excellence and teacher esteem in a research intensive university: the students' value economy in a TEF world

Mike Streule & Lorraine Craig, Department of Earth Science and Engineering, Imperial College, London

The introduction of the Teaching Excellence Framework in the UK Higher Education System has led to a reflective consideration by departments around the country about what 'excellence' is in teaching, and by how we identify our highly esteemed teachers. An investigation into students' values in teaching excellence and teacher esteem in a Geoscience department, and the broader faculty reveals the value economy from the student perspective. The most highly valued attributes are based on the student facing teaching practice; an experienced, passionate, charismatic and approachable teacher by far hold greatest capital. Students reported holding much less value to teaching in industry experience or formal teaching qualifications and highlighted that they thought research was important only in certain educational circumstances. Furthermore, appropriate subject knowledge by the teacher was assumed to be appropriate without question. This research highlights the difficulty in formulating a metric-led approach to a TEF, especially in a diverse subject such as Geoscience, where qualitative attributes are the mostly highly valued by students.

NOTES

GeoLab: Shared Digital Learning Resources for Petrology

Ronan Hennessy¹, Pat Meere¹, Julian Menuge², Shane Tyrrell³, Balz Kamber² and Bettie Higgs¹

¹ University College Cork, ² University College Dublin, ³ National University of Ireland Galway, ⁴ Trinity College Dublin

Email: ronan.hennessy@ucc.ie

The Geoscience e-Laboratory (GeoLAB) project involves the cooperative development of digital teaching and learning resources among the four Irish geoscience university teaching centres in Cork, Galway and Dublin. Collaborating with the Open University, a new collection of petrographic thin sections has been added to the Virtual Microscope for Earth Sciences (VMfES) online library, drawing from teaching resources at each teaching centre. The project explores the teaching and learning implications of using the VMfES in teaching programmes and is investigating its value to the pedagogical enhancement in petrology and in the wider geoscientific domain. Online assessments and self-guided exercises developed using Google Forms have been tested and integrated into the virtual learning environments at each centre. Tutorial and interactive videos have been developed to supplement self-guided learning. The GeoLab project will report on the pedagogical implications of open and unimpeded access to high-quality petrographic learning resources during the term of semester and in advance of examinations, and on the sentiment of both teachers and learners to online learning resources in mineralogy and petrology programmes.

NOTES

Scratching the Surface: striving for excellence in public engagement with geoscience through 'virtual guided walks'

Geraint Owen, Department of Geography, University of Swansea

Engaging the public with geoscience deserves as much attention to teaching excellence as does teaching in more formal Higher Education contexts. *Scratching the Surface* is a set of leaflets explaining the geology along short walks in rural parts of Swansea, funded by the European Agricultural Fund for Rural Development and the Welsh Government through the local authority's Rural Development Business Plan. The leaflets are designed to reproduce the experience of an expert-led guided walk and can be thought of as 'virtual guided walks' in which the leaflet replaces the 'expert'. This contribution will address the challenges to successfully delivering geological information and understanding to the general public through this medium and highlight examples of good practice through which the teacher can aim for excellence. Key features include the use of a continuous narrative which tells a story to reproduce the experience of an expert-led walk, the use of language that simplifies without dumbing down, an initial focus on the familiar or obvious, recognising the secondary role of geology to the walking activity, and the integration of leaflets with a website and 'live' activities.

NOTES

Teaching basic field skills using screen-based virtual reality landscapes

Jacqueline Houghton¹, Annabeth Robinson², Clare Gordon¹, Geoff Lloyd¹ and Dan Morgan¹
¹University of Leeds, ²Leeds College of Art

We are using screen-based virtual reality landscapes, created using the Unity 3D game engine, to augment the training geoscience students receive in preparing for fieldwork. Students explore these landscapes as they would real ones, interacting with virtual outcrops to collect data, determine location, and map the geology. Skills for conducting field geological surveys – collecting, plotting and interpreting data; time management and decision making – are introduced interactively and intuitively. These virtual landscapes are not replacements for geological fieldwork rather virtual spaces between classroom and field in which to train and reinforcement essential skills. Importantly, they offer accessible parallel provision for students unable to visit, or fully partake in visiting, the field. The project has received positive feedback from both staff and students. Results show students find it easier to focus on learning these basic skills in a classroom, rather than field setting, and make the same mistakes as when learning in the field, validating the realistic nature of the virtual experience and providing opportunity to learn from these mistakes.

This work is part of the Virtual Landscapes project, a collaboration between the University of Leeds and Leeds College of Art. All our virtual landscapes are freely available online at www.see.leeds.ac.uk/virtual-landscapes/.

NOTES

SECOND KEYNOTE

Improving the employability of our geoscience graduates (including group discussions)

Gordon Curry, University of Glasgow

The Wakeham report (2016) on “STEM Degree Provision and Graduate Employability” identified the Earth, Marine and Environmental Science grouping as one in which graduate employment outcomes appear to be of concern, and made a number of recommendations. This talk will present a detailed analysis of the available data on the employment outcomes of UK Geology/Earth Science graduates, which was one of the recommendations for further work that was made in the Wakeham report. There are significant concerns about the quality of the data available on Geoscience graduates, which has led to the suggestion that the community response to the Wakeham recommendations should include collecting more robust employment outcome information from our graduates. Further suggestions for possible future action on employability will be described from the response of the Computing Science community, which has long-standing issues over the employability of its graduates. There will be an opportunity to engage in small group discussions about how the UK Geoscience community, and University Geoscience UK, should respond to the challenges laid down in the Wakeham report.

Biography

Gordon Curry is Head of Learning and Teaching in the School of Geographical and Earth Sciences at the University of Glasgow, and Executive Secretary of University Geoscience UK (formerly known as the Committee of Heads of University Geology Departments). He is on the Joint Higher Education Committee of the Geological Society, and on the Committee of the Higher Education Network. A Geology graduate of Trinity College Dublin, he completed a PhD at Imperial College, before moving to the University of Glasgow as a PDRA before receiving a Royal Society University Research Fellowship, and subsequently joining the staff full-time. He is a Senior Fellow of the Higher Education Academy, and has received two Teaching Excellence awards while at Glasgow. His interests span the breadth of teaching in the geosciences, and he was recently one of the leaders of an Early Career Workshop for Geographical, Earth and Environmental Sciences which was organised by the Royal Geographical Society, the Geological Society of London, and the Institute of Environmental Sciences.

NOTES

Improving scientific writing in undergraduate geosciences degrees through peer review

Elizabeth Day, Gareth Collins & Lorraine Craig, Imperial College, London

In the British educational system, students specialise early. Often geoscience undergraduates have not taken a class that requires extended writing since they were sixteen years old. To improve both the writing and editing skills of our undergraduates we have introduced a peer review system, in which finalists review the work of first year students.

At Imperial College London we set written coursework in every year of the degree. There are two major modules with substantial written components that bookend the undergraduate degree; first years all write an assessed essay, while all fourth years take "Science Communication". In the 2015-16 academic year we linked these courses by introducing a modified form of peer marking and instruction, where fourth year students complete reviews of first year essays. These reviews, and decision letters written by students, are distributed as though the first years were submitting their work for publication in a scientific journal.

Feedback for both courses has improved since the introduction of student reviews of essays, as has the overall standard of the essays. We are continuing to include this exercise in 2016-17, utilising technology to make the logistics more manageable.

NOTES

Integrating first year geoscience bachelor students in academia

Rie Hjørnegaard Malm, Department of Geosciences, University of Oslo
Email: r.h.malm@geo.uio.no

Keywords: Academic integration, first-year students, belonging, geoscience.

How do we integrate our first year students in the scientific community? How do we make them feel at home in their department and support them in shaping an academic identity? These are some of the challenges in higher education and academic integration is suggested as one of the ways to work with retention in higher education (Ulriksen, Madsen, & Holmegaard, 2010). The presented research describes and evaluates an exercise undertaken by bachelor students at the Department of geosciences, University of Oslo. The project is intended to introduce the students to the faculty members, their research, and the different paths they have taken to become researchers. The project is modified from the staff-student interview project described by Dwyer (2001).

After the exercise students report a better understanding of the scope of the geosciences and a more nuanced view of research in the geosciences. They express surprise at how accessible the researchers were, and that they feel more at home at the department after the project. The research builds on survey before and after the exercise and individual interviews with the participating students.

Dwyer, C. (2001). Linking Research and Teaching: A staff-student interview project. *Journal of Geography in Higher Education*, 25, 357-366.

Ulriksen, L., Madsen, L. M., & Holmegaard, H. T. (2010). *What do we know about explanations for drop out/opt out among young people from STM higher education programs? Studies in Science Education*, 46, 209-244.

NOTES

Lost in the fog: the importance of liminality and authenticity in learning tasks

Emma Passmore, Senior Teaching Fellow (Senior Fellow HEA), Department of Earth Science and Engineering, Imperial College, London

Liminality is an anthropological term used to describe the uncomfortable transition phase experienced by students who are attempting to master a new discipline, and is probably best known in the educational literature as the phase that precedes the mastery of a threshold concept (Meyer and Land, 2003), or in developmental psychology, as being akin to 'adolescence'. Experiencing and traversing liminality promotes both cognitive and ontological transformations in students (e.g. Field and Morgan-Klein, 2010). The liminal period can be viewed as the cognitive discomfort (the 'fog') necessary to promote learning, but it must be carefully managed to ensure that it does not obscure the benefits of a task, or become a barrier to learning. **Authentic** learning tasks are those that are grounded in 'real' scenarios, and hence can be designed to be well-aligned with professional standards. Authenticity in learning tasks helps to transform students into competent practitioners within their subject, but authenticity can be difficult to achieve in the relatively contrived environment of the classroom.

Independent mapping fieldwork is a good example of a learning task that incorporates a deliberate liminal period (e.g. students grapple with their own interpretations of rock outcrops in the field), and is an 'authentic' task that mimics the competencies demanded of professional practitioners. Educators should not be pressured by today's results-focussed HE culture into designing-out liminality from learning tasks, simply as a means to remove the short-term cognitive discomfort of students and artificially boost 'student satisfaction'. Similarly, authenticity should be incorporated into the design of learning tasks, such as fieldwork - as far as is practicably possible in terms of time, resources and safety - in order to have the most likelihood of effecting identity transformation amongst geoscience students.

Does **excellent teaching** actually mean being brave enough to design challenging, 'authentic' learning tasks for our students, then to give them the physical and mental space to navigate the resultant 'fog' themselves?

Meyer J. and Land R. (2003). Threshold Concepts and Troublesome Knowledge: linkages to ways of thinking and practising within the disciplines. *ETL Project Occasional Report 4*, Edinburgh.

Field J. and Morgan-Klein N. (2010) Studenthood and identification: higher education as a liminal transitional space. Education-line collection [online]
<http://www.leeds.ac.uk/educol/documents/191546.pdf> [Accessed 14/11/2016]

NOTES

Flipping problem maps: bane or benison?

Tom Argles, Open University
Email: tom.argles@open.ac.uk

'Problem maps' require students to deduce the geological history of an area from a geological sketch map. Problem maps have been a staple of Earth Science assessment for many years, reflecting the continuing popularity of map interpretation in geoscience curricula. Many practitioners believe that the skills deployed in deciphering a geological map are of core importance to the discipline (e.g. Ishikawa and Kastens, 2005).

Problem maps provide a uniquely elegant assessment tool, testing high-level spatial skills including visualisation of the subsurface. Simultaneously, the maps require not only recall of geological knowledge but also the sophisticated synthesis of all these elements to reconstruct the geology of an area in both space and time. Arguably, it is precisely these multi-layered, multi-dimensional analysis skills that are so valued by employers far beyond the geoscience sector.

This short, interactive session will introduce the concept of a 'flipped map' exercise, in which students are given a geological history, and asked to draw a geological sketch map consistent with that sequence of events. This is generally considered more challenging than the reverse task, so you may ask: how does this benefit the students? My hope is that, in attempting to actually draw a map, students engage in much deeper learning – even if this involves a degree of 'productive failure' (Kapur, 2008) – and this deeper understanding then renders subsequent conventional problem map questions easier.

Ishikawa, T. and Kastens, K. (2005) *Journal of Geoscience Education*, 53 (2), 184-197.

Kapur, M. (2008). *Cognition and Instruction*, 26(3), 379-424.

NOTES

POSTER ABSTRACTS

Learning with the Lapworth Museum of Geology

James Wheeley, School of Geography, Earth and Environmental Sciences, University of Birmingham

Geology museums and their collections provide valuable learning and development opportunities for undergraduate earth scientists. Utilizing the newly refurbished Lapworth Museum of Geology, University of Birmingham, we have engaged new first year undergraduates in approaches to independent learning at university. An exercise for personal tutorial groups or similar aims to develop team work, time management, synthesis, communication, and presentation skills, amongst others, that align with developing the attributes that characterise the Birmingham Graduate. Teams are given an introduction to the exercise in Welcome Week and begin by using the Lapworth Museum exhibits as a springboard into investigative topics that are researched over the first five weeks of Semester 1, in time outside timetabled classes. Team leaders report weekly on progress. Statements of work are completed to document progress. Teams collectively develop a research findings script and present these in a whole-cohort feedback session as co-authored 5 minute podcasts. The exercise provides a learning opportunity in which new undergraduates can get to know new peers and introduces them to research resources available at the Lapworth Museum and the new University of Birmingham Library that will support them in their degree education.

Burlington House Fire Safety Information

If you hear the Alarm

Alarm Bells are situated throughout the building and will ring continuously for an evacuation. Do not stop to collect your personal belongings.

Leave the building via the nearest and safest exit or the exit that you are advised to by the Fire Marshall on that floor.

Fire Exits from the Geological Society Conference Rooms

Lower Library:

Exit via main reception onto Piccadilly, or via staff entrance onto the courtyard.

Lecture Theatre:

Exit at front of theatre (by screen) onto Courtyard or via side door out to Piccadilly entrance or via the doors that link to the Lower Library and to the staff entrance.

Main Piccadilly Entrance:

Straight out door and walk around to the Courtyard.

Close the doors when leaving a room. **DO NOT SWITCH OFF THE LIGHTS.**

Assemble in the Courtyard in front of the Royal Academy, outside the Royal Astronomical Society.

Please do not re-enter the building except when you are advised that it is safe to do so by the Fire Brigade.

First Aid

All accidents should be reported to Reception and First Aid assistance will be provided if necessary.

Facilities

The ladies toilets are situated in the basement at the bottom of the staircase outside the Lecture Theatre.

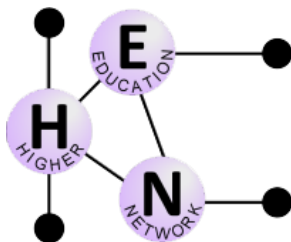
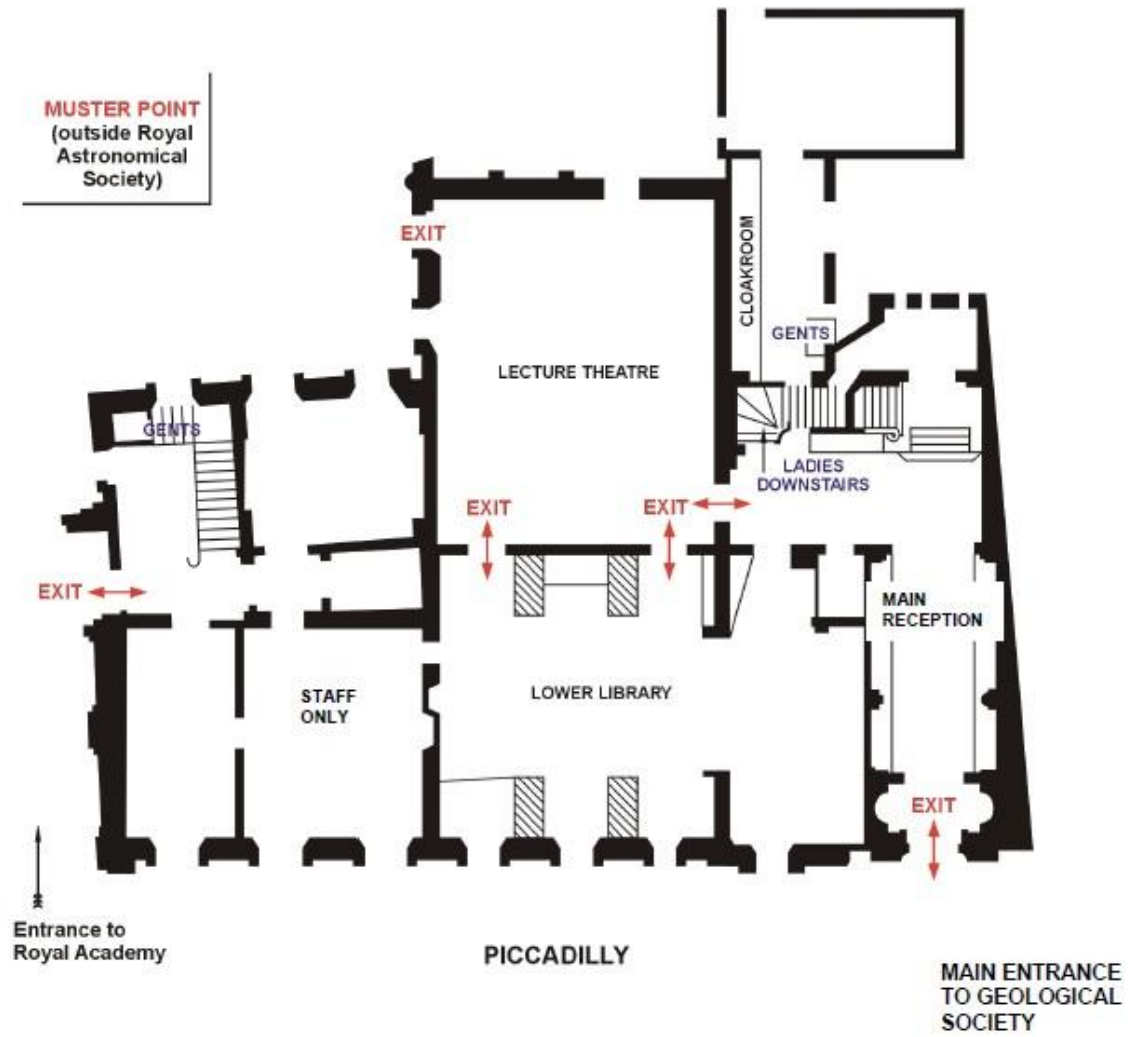
The Gents toilets are situated on the ground floor in the corridor leading to the Arthur Holmes Room.

The cloakroom is located along the corridor to the Arthur Holmes Room.

Burlington House Floor Plan

ROYAL ACADEMY
COURTYARD

MUSTER POINT
(outside Royal
Astronomical
Society)



The
Geological
Society

-serving science & profession