Higher Education Academy

TRANSFORMING TEACHING
INSPIRING LEARNING

HEA STEM Conference 2018: Creativity in Teaching, Learning and Student Engagement

Day one: 31 January 2018

HEA STEM Conference 2018: Creativity in Teaching, Learning and Student Engagement

Table of contents

Strand 1: Psychology

Marlborough room

How to implement collaborative digital writing as an assessment

Dr Jane Guiller, Senior Lecturer in Psychology at Glasgow Caledonian University

How to?

Session 1.1: 11:30-12:00 on 31 January 2018

This session will provide a guide to implementing digital collaborative writing as an assessment. This been used with two cohorts on a final year psychology module. In small groups, students jointly produce a 2000-word critical evaluation of a journal article. They are supported through the process of critiquing the paper and planning and communication stages, building up to the drafting of a formative assessment using Google Docs as a shared digital space for joint composition. Groups are given detailed feedback before handing in the summative assessment. Students then complete an online self and peer assessment of groupwork. The objectives of this session are to outline stages and rationale for this assessment, as well as the pros and cons of this approach from both student and staff perspectives. All materials used in this assessment are available as open educational resources for instructors to use and adapt for their own teaching.

Enhancing learning by quizzing: The forward testing effect

Professor David Shanks, Professor of Psychology and Deputy Dean, Faculty of Brain Sciences at University College London

Paper presentation

Session 2.1: 12:10-12:40 on 31 January 2018

In recent years evidence has accumulated showing that interim testing (quizzing) of studied information such as lecture materials facilitates learning and retention of new information – the forward testing effect. The empirical evidence and putative mechanisms underlying this effect are described. The possible negative effects of administering interim tests and how these negative effects can be mitigated are discussed. Important directions for future research to explore are noted and the practical implications for optimizing learning and teaching in educational settings are summarized.

Using Google apps to facilitate research-based and research-tutored teaching in Psychology seminars

Dr Martin Jones, Senior Lecturer at University of Exeter

How to?

Session 3.1: 13:30-14:00 on 31 January 2018

The purpose of this "how to" presentation is to demonstrate how lecturers can use Google Apps (e.g. ,Google forms, Google Sheet, Google Sites) to provide a balance of research-based teaching and research tutored teaching during psychology seminars. Research based teaching involves creating activities where students learn as researchers, whereas research tutored teaching involves students learning in small group discussions with a teacher about research findings. In practice, the two approaches overlap. In this session, I will provide a theoretical foundation that drives this approach and show the audience how to set up a Google Form to crowdsource data, a Google

Sheet to automatically score data (i.e. questionnaire subscales),visualise data, and run statistics, and finally a Google Site to disseminate findings,

The effects of different text presentation media and font types on adults' reading comprehension

Dr Elizabeth Newton, Senior Lecturer, Dr James Smith-Spark, Senior Lecturer and Duncan Hamilton, Admissions Officer (London South Bank University)

Paper presentation

Session 4.1: 14:10-14:40 on 31 January 2018

Increasingly students are accessing teaching material digitally. Previous research has found individual differences in comprehension for a range of reasons: e.g. Decoding skills (e.g., Gentaz, Sprenger-Charolles & Theurel, 2015), Listening comprehension skills (e.g., Hoganet al., 2014) and Working memory, inference making, comprehension monitoring & story structure knowledge (Cain, Oakhill & Bryant, 2004). The current research is looking at two external factors: Font type and medium of presentation.

Comprehension was significantly reduced when using a tablet, in conjunction with a serif font. Tablets are often given to students preloaded with core texts but it is clear that the font they are presented in needs to be factored in when choosing texts. Some texts allow digital media to alter fonts, whilst others do not. Further research is needed into individual differences and different fonts, especially for those with learning disabilities such as dyslexia.

Students' perceptions of what makes teaching interesting and intellectually stimulating

Dr Jamie Taylor, Principal Lecturer in Psychology at University of Central Lancashire

Paper presentation

Session 5.1: 15:00-15:30 on 31 January 2018

The National Student Survey measures the satisfaction levels of undergraduate students across the UK, with metrics from this survey contributing to the Teaching Excellence Framework rating a University is awarded. To assess satisfaction with teaching, students are asked to rate if staff have made the subject interesting, and the course intellectually stimulating. This presentation reports the findings of a study that investigates students' perceptions of what makes teaching interesting and intellectually stimulating. Neuroscience and Psychology students at a large University in the North of England attended focus groups facilitated by a recent graduate. Participants were asked questions to encourage discussion of teaching practice and establish what they thought makes a teaching session interesting and intellectually stimulating. The results of the focus groups are reported in the presentation. Findings will help to inform educators of good teaching practice and highlight areas for improvement.

Mindfulness as an intervention for recalling information from a lecture as a measure of academic performance in Higher Education: A randomised experiment

Dr Michael Mantzios, Lecturer in Health Psychology at Birmingham City University

How to?

Session 6.1: 15:40-16:10 on 31 January 2018

Students in higher education experience heightened levels of stress, anxiety and report experiencing negative thoughts and emotions, which influences information retention and recall. In a randomized experiment, we assigned participants to either a mindfulness meditation or an audiobook listening condition and recorded the information recalled from a previously attended lecture, which was controlled for in subsequent analyses for trait resiliency and trait mindfulness. Participants placed in the mindfulness meditation condition recalled significantly more information that participants who were placed in the audiobook listening condition, even when controlling for resiliency and mindfulness. Future directions are suggested in an attempt of expanding the literature and research around higher education, mindfulness and individual differences.

A discursive psychological exploration of what motivates students to study

Dr Bryn Alexander Coles, Senior Lecturer in Psychology and Ms Sophie Meakin, MRes Student (Newman University)

Paper presentation

Session 7.1: 16:20-16:50 on 31 January 2018

Since the mid-1960s, university students have become increasingly extrinsically motivated, at the cost of their intrinsic motivation. This project explores participants own constructions, accounts and representations of their own motivation, and seeks to address the question: "What does 'academic motivation' mean to students themselves?". Sixteen undergraduate psychology students (age range 21–60) in their second or third year of study participated in semi-structured interviews. Each interview lasted between 23–84 minutes. Data was analysed using discursive psychological perspective.

Two repertoires of extrinsic motivation were revealed. Repertoire 01 is 'the influence of other people' motivating students to study. Repertoire 02 is 'avoiding undesirable outcomes', as opposed to seeking desirable outcomes. In order to maximise the student experience, universities should ensure they are clear about the benefits of the courses they are offering, and what students will be able to do with their degrees once they have graduated.

Strand 2: General/Interdisciplinary

Grainger Suite

Embedding employability: Stepping outside the comfort zone

Dr Chris Brignell, Lecturer at School of Mathematical Sciences

Paper presentation

Session 1.2: 11:30-12:00 on 31 January 2018

There is an increasing emphasis within HE on employability skills, as measured through metrics included in TEF, for example. In this session we present a case study of how employability skills were embedded within a statistics curriculum. The aim of this presentation is to demonstrate how research, problem-solving, teamwork and presentation skills can be incorporated while simultaneously extending students' subject knowledge. We present solutions to the real and perceived challenges which need to be overcome when changing from a traditional lecture and exam format to workshops and open-ended projects. Our results are encouraging with student evaluation surveys indicating that all students had developed skills used in tackling unfamiliar problems and 92% recommending this employability module to other students. The surveys also highlighted opportunities for refinement and further improvement. We also discuss why there is little correlation between student attainment on this module and their overall attainment across modules.

How confident are you?

Dr Larissa Nelson, Lecturer at Cardiff University

Paper presentation

Session 2.2: 12:10-12:40 on 31 January 2018

Undergraduate students face a difficult transitionary period in their first year of study, where they are exposed to many new personal and academic challenges. During this phase, relatively high levels of dropout have been reported by HE institutions, combined with the rising prevalence of mental health issues.

Self-concept and metacognition are two subjects which have been shown to affect the student experience. This study was novel in that it married the two together by providing a platform for students to reflect on their self-confidence during early formative assessments. This provided students with a scaffold in which to develop their metacognitive abilities. As such, the aim of this study was to investigate self-reported academic confidence in first year undergraduate students during formative assessments.

Results from this study indicated that this novel form of self-assessment may be valuable for educators in identifying students who may benefit for additional support.

Engaging students in Environmental Science: Re-legitimising experts, embedding skills development for sound science and policy relevance

Dr Alastair Smith, Senior Teaching Fellow at University of Warwick

Interactive workshop

Session 3.2: 13:30-14:40 on 31 January 2018

Climate and other environmental science is under existential attack. STEM graduates working in scholarly and professional fields must develop process skills, alongside subject knowledge to re-establish and legitimise their professional identifies. This workshop aims to equip delegates to leave with concrete ideas to embed subject learning with scholarly and professional process skill development, and promote engagement in the process. To achieve this, it briefly presents examples from two interdisciplinary initiatives at the University of Warwick, both designed to create strong student engagement and deep STEM learning:

1) a core 1st year module on Environmental Principles from the new B.A.Sc. Global Sustainable Development

2) a central university optional module on the Challenges of Climate Change.

These illustrate how structural alignment, focused around "authentic assessment" and embedded skills training can drive student engagement. The majority of the workshop however, offers delegates a structured opportunity to undertake their own concrete curriculum development.

Never mind the story: Who's the protagonist?

Mr Max Adams, Consultant Fellow at Royal Literary Fund

How to?

Session 5.2: 15:00-15:30 on 31 January 2018

Participants will learn how to identify and exploit the figure of the protagonist in their writing. The protagonist is the main vehicle for a narrative journey: it might be the author, a theoretical orthodoxy, a technological advance or a mathematical conundrum. Barry Marshall, who self-infected with helicobacter pylori 1984 and won a Nobel prize for identifying the cause of peptic ulcers, is a famous example of the author cast as protagonist. STEM researchers who are introduced to, and use, the concept of the protagonist in their writing find thinking about, structuring and executing their writing easier and more rewarding; and it seems as though they achieve greater impact. In this short session I offer some key insights into developing the protagonist as a tool in STEM writing – and thinking.

Creative approaches to science writing

Dr Mhairi Morris, Lecturer (Loughborough University), Miss Julia Reeve, Co-ordinator (East Midlands Centre for Writing PAD) and ELT Project Officers for the DMU Graduate School (De Montfort University) and Dr Alke Gröppel-Wegener, Associate Professor of C

Interactive workshop

Session 6.2: 15:40-16:50 on 31 January 2018

This 60-minute interactive workshop will allow participants to explore some visual, tactile pedagogies and apply these to teaching academic writing in STEM subjects. Three different creative and unorthodox techniques were developed by the workshop presenters who met through the East Midlands Writing PAD network. These techniques can be used in any discipline to break down student barriers to writing.

The workshop will comprise a brief introduction to the topic, followed by three activities:

1. The postcard technique: using image associations to facilitate thinking around a topic, stimulate debate, and warm up to writing;
2. Reframing: a visual structure for a staged interrogation of a topic;
3. The Dress-Up Doll of Formality: a way of exploring different genres to assist with establishing the rules the writing needs to follow.

Participants will be invited to share their experiences via the Writing PAD East Midlands blog and Twitter feed (@DMUwritingpad).

Strand 3: General/Interdisciplinary
Blaydon room

Kelvin News: An outreach project by and for PGT students
Dr Nicolas Labrosse, Senior Lecturer at University of Glasgow
Paper presentation
Session 1.3: 11:30-12:00 on 31 January 2018
This session will introduce the audience to, and share our experience working on Kelvin News, a project comprising of a web site and magazine run by taught postgraduate students that increases their involvement in the School of Physics and Astronomy at the University of Glasgow, and provides them with an opportunity to write about physics that interests them.
In the first part, we will present the project, and focus on the opportunities it provides to develop and enhance students' graduate skills by getting more involved in the work of the School in ways that the taught masters program might not readily offer. In the second part of the talk, we will describe some of the barriers that need to be overcome, and conclude with the challenges and rewards stemming from this project. The Q&A part will give an opportunity to the audience to comment and share similar experiences.

Improving PhD student completion rates: Supporting doctoral student wellbeing with 'PhD MOTs'
Dr Megan Webb, Researcher Development Coordinator at Centre for Ecology & Hydrology - Natural Environment Research Council
Paper presentation
Session 2.3: 12:10-12:40 on 31 January 2018
The NERC Centre for Ecology and Hydrology (CEH) is a science research institute which hosts PhD students in partnership with universities. In response to growing awareness of the importance of student mental health and wellbeing and its impact on PhD completion rates, a programme was developed to support students by building their self-confidence and resilience. This programme was named the 'PhD MOT', and represented an opportunity for students to pause and take stock. The initiative has had a positive influence on the wellbeing of CEH PhD students and raised the profile of student mental health more widely. This session will describe the background to the development of the PhD MOT and provide details of how a similar programme can be set-up, quickly and simply at other institutions.

How to engage students and provide valuable learning experiences with flipped classroom resources
Professor Beverley Hale, Professor, Learning and Teaching at University of Chichester
How to?
Session 3.3: 13:30-14:00 on 31 January 2018
This session will explore how to engage students in classroom experiences outside the classroom environment. It will explore the use of 'recorded lectures' as a vehicle for flipping the classroom. The aim is to share experience of a particular model and provide an environment where delegates can explore what they want from a flipped environment and how a recorded stimulus can be

adapted to provide that. The session will consider why the classroom should be flipped, if at all, how to plan, prepare and integrate the out of classroom experiences with face to face activities. It will also give some heartfelt advice on what NOT to do!

Self-flipped teaching and learning for STEM in Higher Education

Ms Anna Vasilchenko, PhD student (Newcastle University) and Dr Anne Preston, Senior Lecturer Technology Enhanced Learning (Kingston University)

Paper presentation

Session 4.3: 14:10-14:40 on 31 January 2018

The cultures of social media and prosumerism enter the domain of education and have powered a shift towards learner-centred active learning. This motivates research to develop and evaluate a new instructional and learning strategy that is built on the reuse of student-generated content. The present study proposes an approach, called Self-Flipped Teaching & Learning, where students working collaboratively produce content as part of their learning (the self part of the name). Instructors can use the produced content in their teaching materials for other students in the flipped classroom pedagogical model (the flip part of the name).

This session will focus in on STEM subjects and HE, with the aim to share insights into the feasibility of the proposed approach by reporting on (i) requirements for students to be able to create quality content as part of their learning, and (ii) issues of reusing this content for teaching other students.

Improving student engagement through the use of learning technology: A case study of the University of Liverpool's experience with MasteringEngineering

Dr Graham Schleyer, Senior Lecturer at University of Liverpool

How to?

Session 5.3: 15:00-15:30 on 31 January 2018

The 20-minute session will include

- How MasteringEngineering has been used over the past 5-6 years
- How use of MasteringEngineering has been linked to improving student outcomes and overall performance
- How MasteringEngineering can be used to identify struggling students
- How academics can draw upon these experiences to use learning tools in their own engineering courses

Graham Schleyer from the University of Liverpool will be leading the session for us.

Creativity within the sciences: What can we learn from the arts?

Professor Mark Clements, Director of Education, Chair Science Education at University of Lincoln

Paper presentation

Session 6.3: 15:40-16:10 on 31 January 2018

Science is an innately creative subject; however, the traditional science curriculum often provides only limited opportunities for students to explore the subject creatively. This presentation will critique the pedagogic differences in the way art and science subjects are taught. A range of illustrative examples will be used to explore how the science curriculum can be enhanced through the wider adoption of arts based teaching practices. It will be argued that space should be made

within the science curriculum for students to explore their subject more creatively through the participation in project/design-based learning activities as well as providing opportunities for students to work collaboratively with others from outside their discipline. This will equip graduates with a wider range of 'soft skills' required in order to meet the needs of the fourth industrial revolution.

The development of students' emotional self-awareness through creative images

Mrs Sarah Done, Lecturer and Mrs Beryl Mansel, Senior Lecturer (Swansea University)

How to?

Session 7.3: 16:20-16:50 on 31 January 2018

The aim of this presentation is to introduce delegates to the notion of utilising creative imagery as a tool of reflection in order to develop student's emotional self-awareness.

By the end of the session delegates will be able to:

• Discuss the impact of utilising creative images as tools of reflection
• Apply this methodology to own teaching practice
• Evaluate the effectiveness of a tool for guiding reflection using creative imagery.

Strand 4: Engineering, Materials and Built Environment
Darwin room

Engaging Engineering and Design students through project-based learning
Mr Daniel Craddock, Education Projects Manager (Engineers Without Borders UK) and Mr Oliver Broadbent, Director (Think Up)
Paper presentation
Session 1.4: 11:30-12:00 on 31 January 2018
This paper presentation will look at using project-based learning as a creative pedagogy to increase student engagement in Engineering and Design subjects in the first and second year of undergraduate study. The presentation will use the Engineering for People Design Challenge, an award-winning design programme being run by Engineers Without Borders UK at 28 universities across the UK involving 5000 students each year, as a case study to demonstrate the effectiveness of this method of teaching.
The presentation will draw upon concrete examples of where project-based learning has been a catalyst to increase the degree of student engagement. Evaluation data from the Engineering for People Design Challenge will also be presented to provide evidence of success using this approach to teaching. The presentation will also touch upon training that has been delivered as part of the programme to enable academics to deliver project-based learning initiatives and encourage creativity amongst their students.

Teaching in context: Creating an Engineering curriculum which promotes student engagement in a distance-learning environment
Ms Carol Morris, Senior Lecturer, Dr Sally Organ, Senior Lecturer and Dr Alec Goodyear (Open University)
Paper presentation
Session 2.4: 12:10-12:40 on 31 January 2018
The Open University has over 4000 students registered on its undergraduate engineering qualifications. The majority of these students work full-time and over a third have previous educational attainment below A level.
Students consistently report difficulty with mathematics concepts and frequently view mathematics as a 'necessary evil'. Reflecting on qualitative student feedback and quantitative results' data the Engineering Programme at the Open University has restructured its curriculum to incorporate mathematics teaching in an engineering context and to cease 'service' teaching of mathematics. Less emphasis is placed on mathematical proof and derivation and greater emphasis is placed on understanding basic concepts and creating useful models. Personal and professional development planning has been embedded into engineering teaching, giving it improved context and relevance. Assessment strategies have been developed at the qualification level and are designed to build students confidence whilst being fully aligned with the intended learning outcomes.

Driving excellence through inclusive teaching and learning

Ms Sarah Wilson-Medhurst, HE Consultant and Researcher (University of Northampton) and Dr Jan Peters, Inclusion and Diversity Specialist (University College London)

Interactive workshop

Session 3.4: 13:30-14:40 on 31 January 2018

Excellent learning and teaching practice can only occur where all students have the same opportunities regardless of background and experience. This workshop will share our innovative framework and checklist with the aim of stimulating discussion and ideas that can help evolve or even disrupt existing practice around inclusion education in STEM.

During the workshop, a scoring method will be used to focus discussions about what else could be done and share ideas about next steps in promoting an inclusive culture and pedagogy. As a result, by the end of this workshop participants will have used parts of the checklist to:

• Interrogate aspects of their current programme(s), culture and environment to identify areas of strength and areas for improvement

• Identify some preliminary actions they can initiate to improve their learning and teaching provision with respect to inclusivity

Engineering an Engineering way of thinking

Dr Steve Greedy, Assistant Professor, Mr Daniel Fallows, PhD student, Professor Mark Sumner, Professor of Electrical Energy System and Dr James Bonnyman, Associate Professor (University of Nottingham)

Paper presentation

Session 5.4: 15:00-15:30 on 31 January 2018

In recognition of the changing higher education landscape and industry led demand for graduates with a high level of practical engineering skills, the Department of Electrical & Electronic Engineering at the University of Nottingham has recently redesigned the way its courses are delivered.

The re-design saw the introduction of significant design based modules in Years 1 and 2, accounting for one third of the assessment of these academic years. For the First Year. the module's primary aim was to enable students, from the outset, to think and work as real engineers whilst playing a pivotal role in supporting their transition from FE to HE.

This paper sets out the objectives of the First Year project module, outlines the pedagogical challenges faced from a teaching perspective and with, the module now entering its second year, will also report on the success of the module from the perspective of the student.

Enhanced appreciation of mathematical concepts by Engineering students through simulation and visualisation of differential equations: A model-based design approach

Dr Mike Knowles, Senior Lecturer at University of Sunderland

Paper presentation

Session 6.4: 15:40-16:10 on 31 January 2018

This session will discuss the potential use of model-based design software to enhance understanding of key mathematical concepts related to differential equations, through the use of mathematically-oriented computer-based simulation.

Differential equations are important to engineers, being used to mathematically describe the operation of a wide variety of engineering systems, with applications including mechanical, electrical, and closed-loop control systems. However, students often learn the underpinning mathematical concepts in relative isolation, and may struggle to contextualise their learning, or to apply it in real-world situations.

The current research aims to enable students to confirm their newly gained theoretical knowledge through simulation, to develop their ability to model the behaviour of engineering systems, and the confidence to use mathematics to solve real-world engineering problems.

Enhanced contextual problem solving by engagement in design and build competition: A case study-based review

Dr Ian Tuersley, Principal Teaching Fellow, Director of Studies and Ms Kate Mawson, Senior Teaching Fellow (University of Warwick)

Paper presentation

Session 7.4: 16:20-16:50 on 31 January 2018

The International Submarine Race (ISR) competition, involves design-and-make challenges and a presentation to an industry judging panel providing an excellent demonstration of essential skills and competencies in the students. Student feedback suggests that it is a learning experience which is simultaneously the most demanding, worthwhile and enjoyable feature of their entire programme of studies. Observation and gathered data reported in the paper demonstrates that participating students frequently out-perform their peers who undertake more theoretical or classroom-based equivalent assessments across a range of metrics. This session will discuss the improvements in learning experience for students when collaborative, interdisciplinary teaching, containing both supportive and competitive elements, is delivered. Advice on benefits and drawbacks of such a learning experience with the limitations of absolute financial and time constraints will be presented in order to address the difficulties and successes associated with providing an authentic, contextual-based problem solving learning experience for engineering students.

Strand 5: Mathematics, Statistics and Operational Research
McClintock room

Embracing a digital pedagogy in Mathematics
Dr Barrie Cooper, Co'Director of Education, Mathematics at University of Exeter
Interactive workshop
Session 1.5: 11:30-12:40 on 31 January 2018
Increasingly students are looking for anytime, anywhere access to learning resources and particularly resources that are rich, interactive and can provide real-time feedback on learning. Online tools for developing such learning experiences for scientific and mathematical education have matured to the extent that there are serious alternatives to traditional forms of teaching and assessment in these subjects.
In this workshop, we will report on the progress of a funded project exploring digital pedagogy, jointly undertaken by staff and students at the University of Exeter, and we will provide hands-on experience with some of the most promising online tools for mathematical education, such as CoCalc and Cody Coursework.

A pragmatic approach towards creative pedagogy: Using flip model and fractals to enhance students' engagement through creative practice with calculus concepts
Dr Mojtaba Ammari, Senior Lecturer - Academic Development at Coventry University
Interactive workshop
Session 3.5: 13:30-14:40 on 31 January 2018
In this workshop I will demonstrate how can we use very simple and innovative examples using fractals to design a creative journey from GCSE to high level advanced calculus concepts for your students. In this workshop alongside this creative approach towards calculus concepts I will also employ a flipped classroom approach based on Cognitive levels of thinking in which the pre-activities of the session are based on lower-cognitive thinking. This will then be followed by some higher cognitive thinking activities during the session in which students have to work together in small groups. This creative method not only enhance students' engagement but will allow them to promote and develop their cognitive levels of understanding as well as experiencing a creative process in action.

Bridging the study gap: Provision of support for Mathematics students during breaks in study
Dr Susan Pawley, Lecturer at Open University
Paper presentation
Session 5.5: 15:00-15:30 on 31 January 2018
In Mathematics and Statistics there is a need for students to continually practice techniques in a supported environment, even during gaps between studies and be given appropriate advice on areas where they need to revise previously established knowledge in order to have the best chance of success. At the Open University, I have developed a suite of interactive 'revise and refresh' websites and revision 'boot-camps', where students can self-identify areas they need to practice in

a supported learning environment. By looking at how students have used the resources we can evaluate their effectiveness in relation to retention and pass rates, gaining insight into how students study remotely. This paper will focus on the rationale for the study gap support, how it is used and the progress of the students who used it.

Pingo: An interactive, LaTex compatible system for interaction in large groups

Dr Kristian Evans, Lecturer (Swansea University)

How to?

Session 6.5: 15:40-16:10 on 31 January 2018

Obtaining interaction and engagement in large group teaching can be challenging, in particular in STEM subjects where it is essential to be able to efficiently present symbols, equations and formulae. Pingo is a free, cloud based system that provides an excellent way of introducing interaction in large group teaching. It is particularly useful in the Mathematics based subjects mentioned above as it is LaTex compatible, and it is primarily for this reason that it stands out from other similar systems. Such interaction also provides feedback to students and lecturers, and it is a straightforward, but creative way to enhance student engagement. The speaker has tried and tested Pingo on a weekly basis in two Mathematics modules and obtained both high participation rates and very positive feedback. This talk will provide all the information and resources required to start using Pingo along with a live, interactive demonstration.

How to bring the fun back to Statistics teaching: Inclusive practices to combat statistical anxiety

Miss Zahra Abdulla, Statistician/Teaching Fellow at Kings College London

How to?

Session 7.5: 16:20-16:50 on 31 January 2018

One of the major challenges for teachers of Statistics to non-statisticians is the high levels of statistical anxiety amongst students, student's perceptions of what their experience has been to learn statistics or mathematics in the past and the potential of the negative impact of these attitudes or beliefs on how students learn statistics.

This talk will aim to showcase how to use different types of inclusive practice activities and assessment methods constructively aligned with the learning outcomes, to support in developing students' confidence in the classroom; through providing a supportive learning environment that works through building trust, setting expectations and making statistics fun.

Strand 6: Computing

Ridley room

Supporting creativity and motivation in learning Programming: A musical treatment

Dr Chris Nash, Senior Lecturer / Programme Leader, BSc (Hons) Audio & Music Technology at University of the West of England

Paper presentation

Session 1.6: 11:30-12:00 on 31 January 2018

This talk discusses the use of an end-user computing environment to engage students with programming practice and computational thinking using the context of musical creativity. The talk will detail (with live demonstrations) interactions and lessons using the Manhattan environment, which combines music editing with a scalable level of programming – from simple formulas or code fragments embedded in musical patterns to more advanced algorithms and generative music. The environment enables a wide range of fundamental and advanced computing concepts to be taught visually and musically. Discussions will focus on the importance of supporting intrinsic motivation, scalable challenge, and personal creativity, in tackling complex learning domains like computer science and music theory, and are supported by data and student feedback from classroom use. Recent and future developments, exploring realtime collaboration and connectivity will also be discussed in the context of supporting social learning and extrinsic motivation, and broadening use of the tool.

Creativity – the challenges for Business Education and possible lessons for other disciplines

Dr Andrew Hollyhead, Associate Professor, Mr Jon Curwin, Associate Professor and Mr Michael Schmidt, Academic Skills Development Tutor (Birmingham City University)

How to?

Session 2.6: 12:10-12:40 on 31 January 2018

Creativity is accepted as a desirable characteristic, a skill, an employability attribute and is likely to be seen by students in job specifications and course descriptions. It is harder say what it is, how it can benefit a student and provide opportunities to evidence. Even if courses attempt to address issues of creativity, a student may question why being more creative is part of their course in accountancy or economics. A Creative Problem Solving module has been taught at Birmingham City Business School for a number of years and we have observed how creativity can be from the intended and from the unintended, achieved formally and informally. We have also observed how creativity can be encouraged or constrained in other modules and give an example of the use of 'WhatsApp'. This session will review our experience of creativity in business courses and consider the lessons for in other disciplines.

Gaming innovations in HE

Dr Robert Costello, Senior Lecturer: Games & Programming and Mr Murray Lambert, Senior Lecturer: Games & Animation (Newcastle College)

Paper presentation

Session 3.6: 13:30-14:00 on 31 January 2018

This paper offers a case study in Gaming Innovation for undergraduates within Higher Education. To support the case study we propose a gamification model to support students while they are undertaking their Level 5 Games Technologies & Level 6 Games Development course at a North East HE College.

The model used within gamification will be able to provide a supportive approach for game thinking challenges; build upon excitement and motivational influences to improve retention, engagement, motivation and problem-solving. Through using mixed method approaches we hope to prove that by thorough use of innovative methods learners can be better supported.

An evaluation of Accelerated Learning Degrees

Dr Ismini Vasileiou, Lecturer in Information Systems and Programme Lead for Degree Apprenticeships at University of Plymouth

Paper presentation

Session 4.6: 14:10-14:40 on 31 January 2018

The UK Government is currently re-emphasising the value of Accelerated Learning degrees as a means of widening participation in Higher Education, and offering more flexible study opportunity. This paper aims to share findings arising from participation in an earlier HEFCE-funded pilot of fast-track degrees in 2008-2010. An evaluation research methodology was applied to a suite of three degrees offered in the Computing subject area, and the objectives of the session will be to:

• explain the concept of Accelerated Learning and its role in HE delivery;
• illustrate how the design of an Accelerated Learning programme differs from traditional provision;
• explore how the resulting environment influences student learning;
• share findings arising from the running of the degrees in practice.

The findings are relevant to both academics and students, and it was seen throughout the pilot that Accelerated Learning requires a high degree of motivation and commitment from both parties.

Embedding professional skills for computing (cyber security) students through a creative immersive learning approach

Mrs Clare Johnson, Head of Cyber Security at University of South Wales

Paper presentation

Session 5.6: 15:00-15:30 on 31 January 2018

The aim of this session is to introduce an innovative approach to embedding personal and professional development skills in STEM subject curricula, share our evaluation strategy and outcomes (warts and all) in order to spark discussion to build on successes and learn from

attendees. Taking on board student feedback from a traditional delivery mode (lectures and tutorials) for a module entitled 'Professionalism & Governance in Cyber Security', the module was completely restructured using an immersive learning model. Adopting an authentic learning curriculum design approach, the module involves students working on live industry projects.

By the end of the session attendees will have a clearer understanding of the benefits and pitfalls of such an approach, and a practical understanding of how it can be adopted in STEM subject areas.

To flip or not to flip?

Miss Colette Mazzola, Programme Leader at Blackpool and the Fylde College

How to?

Session 6.6: 15:40-16:10 on 31 January 2018

The aim of the session is to explore the concepts of Flipped learning as they relate to the teaching of Computing disciplines. The presentation will enable participants to:-

1. Implement a flipped approach to teaching and learning

2. Apply principles of Flipped Learning to own subject discipline

3. Evaluate the potential for engaging students and supporting their development beyond the classroom.

The presentation will be an interactive opportunity to interrogate concepts of learning which directly apply to the Flipped online approach and to discuss applications, benefits and potential pitfalls for practitioners.

Development of a 'Lab-in-a-box' approach for large classes

Dr Michael Cregan, Lecturer in Education at Queen's University Belfast

How to?

Session 7.6: 16:20-16:50 on 31 January 2018

For many popular engineering courses, first-year students often encounter very large class sizes. Trying to maintain a good student experience that is both conducive to learning and stimulating an interest in the subject can be difficult. Often there is insufficient equipment and limited laboratory space.

The aim of this session is to explain how a new low cost 'Lab-in-a-box' course was developed to allow students to go beyond the benefits of a traditional microcontroller/electronics course with the freedom to work from any location. We will also review the structure of the course and how a blended learning approach was used to allow students to work at their own pace. Finally, I will show how this has improved the student experience using feedback and evaluation scores.

Strand 7: Sciences

Jenner room

Virtual field courses: Widening access to ecosystems

Dr Wendy Harris, Lecturer and Dr Marc Holmes, Research Officer (Swansea University)

Paper presentation

Session 1.7: 11:30-12:00 on 31 January 2018

We are creating a library of interactive 360° photos to improve cohort integration and engagement through opportunities to experience (virtual) field environments. Students can use the library to achieve three potential objectives: to facilitate their own learning through prior access to the field environment; to develop field biology skills without direct access to field environments; and to familiarise themselves with novel habitats and/or ecosystems (V1, V2). We are using regular engagements with staff and students to provide feedback on the tours, which we use to change and enhance current and future tours. We report users' experience of the tours as they control their movements and interact with additional content.

Evaluating the benefits of virtual training for Bioscience students

Dr Caroline Louise Smith, Senior Lecturer and Dr Sarah K. Coleman, Lecturer (University of Westminster)

Paper presentation

Session 2.7: 12:10-12:40 on 31 January 2018

Understanding the risks associated with laboratory work and equipping students with knowledge to ameliorate these risks is an essential part of bioscience training. Students arriving at University of Westminster have a range of laboratory competencies reflecting the diversity of the students and entry qualifications. Laboratory simulations can place students in a life-threatening scenario enabling them to make mistakes without risk.

Our aim was to see whether the use of a commercially available "Labster" Health and Safety simulation, within a large core first year biochemistry module, increased student engagement and understanding. This simulation provides a realistic laboratory scenario and students must answer questions throughout to progress.

We have evaluated both the immediate student experience of this laboratory simulation, as well as evaluating the longer impact of the simulations, (surveying students in the following academic year) and will discuss our findings of the impact of laboratory simulations on student engagement and understanding.

Blended marking for Mathematics: Combining human marker and Maple T.A. to optimise marking quality and speed

Dr Jonathan Watkins, Maple T.A. Development Manager (University of Birmingham)

Paper presentation

Session 3.7: 13:30-14:00 on 31 January 2018

There is reluctance from both instructors and students to adopt machine marking (MM) for assessment because of the lack of granularity in the marking. For the MM, answers are either completely right, at points where they are compared with that of the model solution or wrong and

score zero. However, the ideal human marker (HM) will catch algebraic slips and deploy an error carried forward marking algorithm or allocate marks for methods that had some level of validity to them. These are completely justifiable concerns, to be balanced against the efficiency and consistency of MM. In this paper we seek to quantify the depth of feedback as a function of the mark achieved and to construct a blended marking model which delivers comparable individual feedback whilst retaining significant efficiency due to the MM.

Tackling the pre-existing 'Mathematics Problem' in first year undergraduates using Hogan's Numeracy Framework and simulated peer-assessment

Dr Fraser Scott, Senior Lecturer in Pharmacology at University of Huddersfield
Paper presentation
Session 4.7: 14:10-14:40 on 31 January 2018
The 'mathematics problem' is a well-known source of difficulty for students attempting numerical problem solving questions in the context of science education. This research illuminates the problem by invoking Hogan's numeracy framework and in doing so, reveals that the contextualisation of mathematics within the domain of science is not the main source of difficulty for students but rather more fundamental mathematical skills.
Having highlighted the problem, simulated peer-assessment is investigated as a method to improve student performance in numerical problem solving questions in a science education context. Additionally, the benefits of using simulated, rather than real, students' answers in peer-assessment is discussed. The results demonstrate that a simulated peer-assessment activity is suitable as a replacement for standard peer-assessment and that students' attitudes favour the simulated approach.

You said, we did! Aligning graduate skills with employer requirements

Dr Laura Jayne Roberts, Senior Lecturer, Dr Wendy Harris, Lecturer, Dr Penelope Neyland, Senior Lecturer, Professor Daniel Eastwood, Professor and Dr James Bull, Senior Lecturer (Swansea University)
How to?
Session 5.7: 15:00-15:30 on 31 January 2018
The aims of this study were to develop a field-based curriculum that reduced the gap between environmental sector employer requirements and graduate skills. Questionnaire responses and informal interviews indicated employers valued transferable skills and general ecological knowledge over more specialised professional skills at the graduate level. Feedback from employers was used to create and fine-tune a pathway that made students industry-ready through provisioning relevant content, in the correct quantity, of broad ecological knowledge, core and professional field skills. This encompassed a residential ecology field course for HE Level 5 which constructively aligned with a Professional skills module in HE Level 6. Evaluations revealed that students recognised the pathway improved their knowledge of ecology, developed key practical skills and enhanced their employability. Importantly, the findings indicate that engaging employers with the development process can drive teaching excellence by refining curricula so that graduates can meet industry requirements.

Spreading the impact: Using REF impact case studies to introduce first year undergraduates to faculty research

Dr Sue Whittle, Associate Professor at University of Leeds

Paper presentation

Session 6.7: 15:40-16:10 on 31 January 2018

This session describes and evaluates the adaptation of Impact Case studies submitted to REF2014 by Faculty of Biological Sciences to create on-line teaching materials for an innovative new module. The module, which uses a flipped teaching approach, is open to students without a science background, and explores projects from across the spectrum of biological sciences, from ecology to cells. The aim of the material is to introduce students to research carried out by staff in their own Faculty, and the range of possible impacts of research. The module delivery focuses on development of important generic skills, including teamwork, writing for different audiences, oral presentation, and reflection on learning. The challenges involved in the design, delivery and assessment of this module, and evaluation of students' attitudes to research will be discussed.

Innovative teaching approaches: Including the use of social media as a teaching tool

Mr Philip Crilly, Pharmacy Teaching Fellow and Professor Reem Kayyali, Professor of Clinical and Applied Pharmacy Practice (Kingston University)

Paper presentation

Session 7.7: 16:20-16:50 on 31 January 2018

At a time when the future employability of our students is a priority this session aims to demonstrate how employability skills such as teamwork, creativity, leadership and entrepreneurship can be embedded within a coursework assignment.

In addition, this session will address the innovative use of digital technology, in particular social media, in education. With an ever-growing proportion of our students having spent their formative years surrounded by new digital advancements higher education needs to adapt teaching approaches to their preferred learning mediums. The session will share how social media has been used by students to teach others about public health topics and how they have learned from each other.

The presenters will explore with delegates how this innovative learning and teaching approach can be adapted to a wide variety of subject disciplines within STEM.

Strand 8: General/Interdisciplinary
Gibbs room

From small steps to big changes: An institutional journey towards blended learning

Dr Paul Holland, Dean of Educational Technology, Deputy Director of Learning and Teaching and Mrs Rhian Kerton, Chair of College of Engineering Learning and Teaching Enhancement Centre, Senior Lecturer (Swansea University)

Paper presentation

Session 1.8: 11:30-12:00 on 31 January 2018

This session will explore how the use of blending learning at Swansea University has developed from a few isolated academics to a university wide initiative. The College of Engineering at Swansea University started introducing blended learning into the learning and teaching provision several years ago. This session will describe the methodology adopted, the impact of the changes on student performance and engagement, the impact on staff and a pilot project being run during the 2017-2018 academic year to build on successes and roll out the use of appropriate Blended Learning solutions to all seven Colleges at Swansea. This session aims to give attendees the tools and confidence to start their own journey with blended learning and encourage open discussions and sharing of best practice.

Utilising backchannel software to promote student engagement inside and outside the lecture space

Dr Andrew McDowell, Lecturer in Education, Ms Angela Allen, Lecturer in Education, Aidan McGowan, Lecturer in Education, Dr Matthew Collins, Lecturer in Education and Dr David Cutting, Lecturer in Education (Queen's University Belfast)

Paper presentation

Session 2.8: 12:10-12:40 on 31 January 2018

Promoting learner engagement in large cohorts is a well-documented problem. One solution adopted in the lecture space is 'backchannel' software, which in its simplest form, provides an online chat facility that operates alongside lecture delivery. This provides an opportunity for learners to interact and ask questions without the fear of speaking out in front of a large group. Similarly, backchannel software can be used outside the lecture space to enhance engagement; however, this use has not been fully explored.

Accordingly, the aim of this work is to evaluate the benefits of backchannel software to promote engagement inside and outside of the lecture space. This was achieved using the TodaysMeet backchannel service to collect 2,022 messages from 185 learners undertaking a second semester, first year programming module at Queens University Belfast. Subsequently, the findings support continued use of backchannels for promoting learner engagement inside and outside the lecture space.

How to proactively teach large class sizes in STEM subjects: A very practical guide

Dr Katja Strohfeldt, Teaching and Learning Dean; Associate Professor in Pharmaceutical Chemistry and Dr Rachel Pye, Associate Professor (University of Reading)

How to?

Session 3.8: 13:30-14:00 on 31 January 2018

Teaching of large cohort sizes is becoming more and more prominent at Universities. Many colleagues will have experienced this and also faced the challenges, which come with teaching large class sizes especially in STEM subjects.

The aim of this session is to introduce you to real-life tips and tricks to improve teaching and learning in large class sizes of STEM subjects – often using very creative approaches.

You will

• Get further insight about our research on student perception of large class teaching, especially in increasingly diverse cohorts

• Be introduced to our "Large Class Education Toolkit" – a very practical guide, containing from around 40 real-life case studies from colleagues in STEM or related subjects.

The "Large Class Education Toolkit" was developed at the University of Reading and was published in July 2017. So far, it has been highly successful, being used at Teaching and Learning away days and presented at international conferences.

How to give individual examination feedback to large cohorts of students at no extra cost in terms of marking time

Dr Andy Grayson, Reader in Psychology at Nottingham Trent University

Paper presentation

Session 4.8: 14:10-14:40 on 31 January 2018

It is a moral and pedagogic imperative that education providers find ways to give students effective personalised feedback on their examination performances. Resources are the main obstacle. This paper will describe a process for providing effective, individual feedback to psychology students on any type of examination (MCQs, long answer essays, short answer papers etc.), at no extra cost to exam marking time. Using available online, mobile forms we have developed and evaluated processes for delivering such feedback to thousands of psychology students, who have unambiguously welcomed the insights that exam markers have thereby been able to give them into how future examination performances can be improved. Working within contemporary constructivist conceptualisations of feedback as 'dialogue' we have found a way of including students in the process of 'being examined', rather than leaving examination as something that is simply 'done to' them.

Developing and delivering an online framework for lab teaching in a cross-disciplinary Collaborative Teaching Laboratory

Mr Joseph Berry, TEL Development Manager for Life and Environmental Sciences at University of Birmingham

Paper presentation

Session 5.8: 15:00-15:30 on 31 January 2018

This session explores the challenges of developing and delivering an online teaching framework across multiple lab-based subject areas including Engineering, Chemistry, Biosciences, Geography, Earth and Environmental Sciences, and Chemical Engineering.

In addition, the session will look into the practical challenges of developing a large quantity of high quality digital resources, including video, 360 photos, interactive apps and an electronic lab notebook (ELN) solution.

Student perception of online group work: Benefits, obstacles and interactions

Dr Victoria Nicholas, Associate Dean (STEM) and Dr Mark Hirst, Senior Lecturer (The Open University)

Paper presentation

Session 6.8: 15:40-16:10 on 31 January 2018

This paper focuses on a study of student perceptions of a team project carried out by second year undergraduate Open University science students. We describe our findings as to, (i) whether students see the benefits of interdisciplinary collaborative working, (ii) what students report as helping them work collaboratively, (iii) the obstacles reported by students to interdisciplinary team working and, (iv) the effect of forum interactions on the success of collaborative working and ultimately module result.

Evaluation of a VLE site to prepare students for a Level 1, online, distance-learning science module

Dr Christopher Hutton, Staff Tutor in Earth and Environmental Science at Open University

Paper presentation

Session 7.8: 16:20-16:50 on 31 January 2018

A VLE site was established to help online distance learners prepare for a new interdisciplinary level 1 science module. The site aimed to improve retention and success by enabling students to sustain / build skills, knowledge, motivation and confidence before module start. This session provides evaluation of a student feedback questionnaire (n = 16) and peer review by two tutors moderating the forums, and identifies priorities for future development as part of the on-going project.

While satisfaction was high among respondents, students engaged little with forums, using them to re-establish contacts from previous modules rather than seek academic support. Furthermore, students would have liked synchronous tuition and the periodic release of new study materials. Next year, building a study community of students and tutors on the forum, as well as introducing some synchronous tutorials, are the key priorities for increasing engagement.