

# STEM Conference 2019

AdvanceHE

Conference programme

30 - 31 January 2019

Millennium Point, Birmingham

#STEMConf19



Delivering next  
generation  
higher education  
in STEM



# Advance HE STEM Conference 2019

## Delivering Next Generation Higher Education in STEM

30-31 January 2019  
Millennium Point, Birmingham UK

### Session abstracts

#### Contents

<b>Day 1, 30 January 2019</b> .....	<b>6</b>
<b>Session 1, 10:50-11:30</b> .....	<b>6</b>
Session 1.1a: Curiosity and reward: A detective's game. Neuroscience applications to memory enhancement.....	6
Session 1.1b: Synoptic assessment of Life Sciences at Brunel University London: Ensuring interdisciplinary education by empowering Level 4 students to read primary research papers that span disciplines.....	6
Session 1.2a: Factors impacting on Petroleum Engineering teaching to meet requirement for the hallmarks of a graduate .....	6
Session 1.2b: The Interdisciplinary Birmingham Engineer: Integrated design projects that embed sustainability concepts to inspire and motivate students while improving their employability .....	6
Session 1.3a: Web-based learning and teaching resources for microscopic detection of human parasites.....	6
Session 1.3b: The development of a flexible work-based degree programme to produce graduate Power Engineers that can successfully navigate the rapidly changing geo-political demands on the UK electrical power industry .....	7
Session 1.4a: Will a new British Bill of Rights promote a better understanding of equality and diversity?.....	7
Session 1.4b: TBC.....	7
Session 1.5a: Making virtual reality a reality in STEM education.....	7
Session 1.5b: The impact of digital capabilities on the quality of STEM teaching.....	7
Session 1.6a: Interactive Science at the Universidad Tecnológica of Uruguay: A program based on the STEM model .....	8
Session 1.6b: How do scientists and Science undergraduates read scientific papers?.....	8
Session 1.7a: TBC.....	8
Session 1.7b: Look to the US? Case study of Suffolk Centre for Female Entrepreneurship .....	8
Session 1.8a: Designing experiential assessment and providing meaningful feedback to equip students for leadership and critical thinking.....	8
<b>Session 2, 11:45-12:45</b> .....	<b>9</b>
Session 2.1a: Employability-led assessments .....	9
Session 2.1b: Embedding professional skills education in the Computer Science and Electronic Engineering curriculum: Cultural, organisational and managerial aspects .....	9
Session 2.1c: Employer engagement to engaged employers: Reflections on programme co-design and co-implementation with employers .....	9
Session 2.2a: The use of learning technologies to enhance classroom dialogues .....	9
Session 2.2b: Learning with quizzes .....	9
Session 2.2c: Diagnostic tests and their effectiveness in categorising students.....	10
Session 2.3a: Going paperless: The digital teaching laboratory .....	10
Session 2.3b: When STEM students are offered a blend of digital and non-digital learning materials, what choices do they make, and why?.....	10
Session 2.3c: VISION - Visual Interface for Students to Interpret Online Notes and become scientific writers .....	10
Session 2.4a: Championing inclusion: Working with students as partners to effectively inform learning and teaching development.....	10
Session 2.4b: Undergraduate sense of belonging in a Science department .....	10
Session 2.4c: How peer/friendship groups form, and their effect on attainment.....	11

wider diversity of students. In this talk, the use of technology and mentoring other staff to increase engagement in tasks and assessment will be discussed.

### **Session 9.3a: Does blended learning increase students' engagement and satisfaction?**

Dr Kaska Sypek, University of Strathclyde

Proposition 3

*Oral presentation, Connect 1 + 2*

A recent publication by The World Economic Forum demonstrates the need for 101 days' training or upskilling of employees by 2022. Are we preparing our full-time graduates to be life-long learners? In an undergraduate, full-time course; one week's course material was delivered online (Moodle Lesson) to study students' reactions to the new method of delivery. After three years of post-project surveys it appears that while the majority of respondents liked the lesson when asked if they preferred this kind of delivery in comparison to a traditional lecture only half responded positively to the question.

### **Session 9.3b: A scalable blended approach to student diversity**

Dr Carlos Matos and Mr Nuno Barreiro, Royal Holloway, University of London

Proposition 3

*Oral presentation, Connect 1 + 2*

In this session we present a system that allows university students to progress at their own pace, providing real-time monitoring and adapting to each student's needs and expectations. Some students require more support and advice, and others need to be challenged in order to remain engaged. Our system gives opportunities to all students to pursue their studies with a successful outcome. Progress monitoring also informs staff on the readiness of students to participate in advanced courses or more challenging projects, for instance with real clients, presenting opportunities that will last for their professional life.

### **Session 9.3c: Addressing student retention and engagement using new technology**

Dr Antonio Peña-Fernández and Mark Evans, De Montfort University and María Ángeles Peña, Universidad de Alcalá

Proposition 3

*Oral presentation, Connect 1 + 2*

A range of strategies to improve retention and progression of Biomedical Science students at De Montfort University (DMU) implemented in 2016/17 included: an intensive induction week with social/networking events involving academics; an increment in the number of lectures and tutorials on STEM topics; the creation of regular drop-in sessions for each module. These strategies might have translated into a trend in the reduction of the percentage of students that failed in year 1, due to academic circumstances, from 19% in 2014/15 to 9.6% in 2016/17. More actions being developed include creation of a complete website covering fundamental Biology and Chemistry.

### **Session 9.4a: Self-efficacy: Empowering diversity in STEM recruitment**

Dr Philippa Boyd and Associate Professor Maria Vahdati, University of Reading

Proposition 4

*Oral presentation, Connect 3*

Much effort and many words have gone into the development of outreach materials to encourage young people to study STEM subjects at university. Even more effort and debate has been made to increase the appeal of these materials to both those from BAME groups and women. The aim of this research is to explore whether these materials have their desired effect, which elements are effective in attracting the target groups, and what materials in an increasingly digital age, are relevant in forming career and university choices. This session presents our research and explores implications on addressing equality, diversity and inclusion issues across STEM disciplines.

### **Session 9.4b: Inclusive Engineering**

Professor Kate Sugden, Aston University

Proposition 4

*Oral presentation, Connect 3*

Diversity and inclusion in Engineering has been a focus which has been growing in importance over the past few years, but remains something that is discussed on the fringes of our work, rather than something that we reference on a daily basis. In order to ensure that we produce the best, most accessible, non-biased, inclusive products and services, we need to ensure that we foster a mind-set of inclusion that allows us to consider our designs in an all-inclusive way, not only looking through the lenses of people with protected characteristics, but also considering a range of other lenses.