Institute of Physics
Higher Education Group

The University of Edinburgh
Centre for Science Education

Technology-Enhanced Assessment
Assessment is one of the key drivers of student learning. Technology has the potential to transform assessment practices in ways that encourage student engagement and promote deep learning.

Tuesday 13 December 2016
10:30 – 15:45

University of Edinburgh
James Clerk Maxwell Building (Room 4325C)
King's Buildings
Peter Guthrie Tait Road
Edinburgh
EH9 3FD

Programme

10:30 – 10:55	COFFEE
10:55 – 11:00	*Welcome*
	Judy Hardy, University of Edinburgh
11:00 – 11:30	*Harnessing the power of the populous to enhance the learning environment*
	Barry Ryan, Dublin Institute of Technology
11:30 – 12:00	*Digital badges for assessment of laboratory skills*
	Michael Seery, University of Edinburgh
12:00 – 12:30	*Using peer assessment to promote group work and skills development*
	Paul Chin, University of Hull
12:30 – 13:30	LUNCH
13:30 – 14:00	*"That's not a PDF!" Maintaining standards after implementation of electronic submission and assessment in a large undergraduate class.*
	Morag Casey, University of Glasgow
14:00 – 14:30	*Automatic marking of short-answer free-text questions*
	Sally Jordan, Open University
14:30 – 14:45	COFFEE
14:45 – 15:45	*Online assessment of science with the STACK CAA system*
	Chris Sangwin, University of Edinburgh
15:45	CLOSE

Abstracts

Harnessing the power of the populous to enhance the learning environment
Barry Ryan, Dublin Institute of Technology

NearPod is a multiplatform, blended e-learning tool that allows students to engage with each other and the lecturer in real time, independent of learning space size or type. In this project the use of NearPod was investigated in three different third level educational settings; a large foundation organic chemistry module, a medium size intermediate biochemistry module and a small maths for STEM programme.

The rationale for this project was two-fold; practical implementation of key trends in higher education and enhancing the student learning two key trends in a simple, cost effective way. Secondly, the research sought to investigate if embedding engaging technology into the learning environment could enhance the student learning experience.

The use of NearPod as a constructivist learning tool was evaluated in terms of student interaction, engagement and participation through NearPod facilitated synchronous learning activities. Evaluative data was collected in several forms; anonymous questionnaires of all students that experienced a NearPod module, independent academic facilitated discussion fora with purposefully sampled students, staff reflective diaries and NearPod data analytics. Qualitative data analysis was carried out under Braun and Clarke's (2006) model and fed into a triangulated data set, ensuring only valid themes emerged. Overall, the students perceived use of the technology, and the academics personal reflective writings, informed the success of the project. It was noted that the learning environment evolved towards a student-orientated, social constructivist space where the students took ownership for their participation in the learning activity. Students became responsible for constructing their learning 'product'; created by the students, for the students and, hence, their learning overall experience. Recent NMC Horizon Reports cite the higher education adoption of BYOD (Bring Your Own Device) and flipped classroom learning is imminent. One aim of this project was to identify if NearPod could address these.

Digital badges for assessment of laboratory skills
Michael Seery, University of Edinburgh

Using peer assessment to promote group work and skills development
Paul Chin, University of Hull

Peer assessment is a well-established form of formative or summative peer review, but which takes active student engagement to be successful. It can also be used to promote collaborative group work where students work towards a common goal. By engaging students in peer assessment and group work, there are also great opportunities for skills development ranging from communication skills, organisational skills and even conflict and

negotiation skills. Peer assessment delivered in the right context therefore provides a number of opportunities to support group work and a range of skills development opportunities.

This presentation will discuss an electronic approach to peer assessment using an international award winning tool called WebPA. Simply putting students into groups and expecting them to work together will not guarantee good collaboration - there are a number of factors involved in supporting this. An overview of longitudinal work carried out with students across two disciplines will be provided based on established research in the field. Results will also be discussed about how peer assessment has been shown to promote skills development. Peer assessment is a valuable model for promoting group work and skills development and this presentation will share some experiences and tips on implementing peer assessment in the curriculum.

"That's not a PDF!" Maintaining standards after implementation of electronic submission and assessment in a large undergraduate class.
Morag Casey, University of Glasgow

The requirements of offering regular continuous assessment whilst simultaneously providing meaningful feedback for students are, unfortunately, rarely scalable when addressing large increases in student numbers. The doubling of student numbers in level-1 Astronomy at the University of Glasgow has forced the embrace of electronic submission and assessment tools in order to reduce staffing overheads.

I will present preliminary data about the implementation, pitfalls, arguments and lessons learned by both students and staff in level-1 Astronomy in 2016-17. My conclusion is that, with careful management, it is possible to preserve previous assessment and feedback regimes without any downgrade to either the student learning experience or staff sanity.

Automatic marking of short-answer free-text questions
Sally Jordan, Open University

For nearly 10 years, Open University interactive computer-marked assignments have included questions which require students to give their answer as a short free-text sentence. Various technologies have been used, eventually leading to the development and refinement of the Moodle "Pattern Match" question type. Evaluation has included comparisons of marking accuracy and investigations into student reaction to questions of this type, and more general lessons have been learned about student engagement with assessment and feedback.

After reviewing our work in this area, this talk will provide an opportunity for attendees to see the answer matching software for themselves, and to discuss the potential of questions of this type as a tool for assessment, as a means of fostering student engagement, and as a way of investigating conceptual understanding.

Online assessment of science with the STACK CAA system
Chris Sangwin, University of Edinburgh

Automatic computer aided assessment is increasingly being used to support STEM education. This talk will review current online tools which support the objective assessment of mathematics. It will then demonstrate some new tools for establishing the objective properties of dimensional numerical quantities using the STACK computer aided assessment system. STACK is widely used in mathematics, and increasingly used in physics. Lastly we suggest ways these tools can be used to in everyday laboratory settings to assess students' experimental work.