



SEB+ ABSTRACTS

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SEB+ 1 THE TEACHING-RESEARCH NEXUS

ORGANISED BY: GRAHAM SCOTT (TEACHING AND LEARNING CONVENOR, SEB+) AND GEORGE LITTLEJOHN (SECTION CHAIR, SEB+)

SEB+.1 DO WE NEED TO DESIGN UNDERGRADUATE RESEARCH EXPERIENCES FOR AUTHENTICITY?

📅 MONDAY 3 JULY, 2017 ⌚ 09:00

👤 SUSAN ROWLAND (INSTITUTE FOR TEACHING AND LEARNING INNOVATION, AUSTRALIA)

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Educators frequently seek to design and implement “authentic” learning and assessment activities with the goal of engaging students and preparing them for their futures in the workplace. In a recently-completed Australian national program, our team helped 39 academics from multiple universities design, implement, and document large-scale undergraduate research experiences that were “authentic”.

The work has led us to ask a number of fundamental questions. What exactly is “authentic” science education? Do students experience an “authentic” science education differently from one that is not designed for authenticity? Do we even need to design for authenticity at all?

In this talk I will address these questions, and the answers we have obtained through our scholarly examination of our educational implementations. The answers will help educators design and deliver science experiences that have more value for students (and more opportunities for students to experience their own version of authenticity!)

SEB+.2 CAN WE DESIGN DEGREES THAT EFFECTIVELY ENABLE STUDENTS TO JOIN THE RESEARCH COMMUNITY?

📅 MONDAY 3 JULY, 2017 ⌚ 09:40

👤 KATHARINE E HUBBARD (UNIVERSITY OF HULL, UNITED KINGDOM)

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Engaging in a final year research project is a capstone experience in most undergraduate degree programmes. However, the student research experience is often very different from the academic research experience due to a lack of authentic opportunities for research dissemination and feedback. Students therefore often miss out on a key part of the research cycle, and their work is only shared with a very narrow audience. In this presentation, I will consider how authentic research dissemination can build the research identity of undergraduates, and develop key transferrable skills valued by employers. As a model to explore this topic, I will present research we have carried out at the ‘Student Thesis Conference’ event, which is embedded into all three years of degree programmes in Sport, Health and Exercise Science at the University of Hull. This project indicates presenting research to large audiences at multiple points in the degree programme can be an effective engagement strategy for students of all abilities. Another benefit of this model is a reduction of the gender gap in perceived confidence, so may reduce the ‘leaky-pipeline’ effect in STEM subjects. I will therefore also explore how we can integrate research dissemination into degree programmes, and better prepare our students for either employment or post-graduate research.

SEB+.3 CURRENT CHALLENGES, OPPORTUNITIES AND NEXT STEPS FOR RESEARCH-LED EDUCATION WITHIN EXPERIMENTAL BIOLOGY

📅 MONDAY 3 JULY, 2017 ⌚ 09:55

👤 SARA BURTON (UNIVERSITY OF EXETER, UNITED KINGDOM)

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As researchers and educators, we must recognise the ever changing challenges and opportunities for our higher education communities. In our increasingly connected education environment, we may need to re-focus on understanding what are the current and future needs of our students including recognising specific technical skill shortages within our local and international economies. How do we or can we do this?

New education reporting requirements and analyses including Teaching Excellence Framework metrics may force us to ensure robustness of spending decisions with respect to measurable student outcomes including employability. Can we/should we develop methods to more effectively forecast efficient use of resources and positive impact on student skills development by mapping student formal and informal research experiences onto the accepted required graduate skills? Do we know the outcomes of graduate skill enhancement (measured through employability) through research led teaching locally, and how might we use this to modify future practices?

Examples of and opportunities for successful students teams taking lead roles as change agents in developing new technologies through synthetic biology (iGEM) will be discussed.

The potential role of institutions including learned societies in working towards more efficient industry-university research links and opportunities for students will also be considered.

SEB+.4 EMBEDDING LINKS BETWEEN TEACHING AND RESEARCH AT A RESEARCH-INTENSIVE UK UNIVERSITY

📅 MONDAY 3 JULY, 2017 ⌚ 10:25

👤 SARA MARSHAM (NEWCASTLE UNIVERSITY, UNITED KINGDOM)

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The links between teaching and research were investigated to determine how these were implemented at a research-intensive university. One of the first objectives was to define these links and to establish an understanding of how research activities feed into the delivery of teaching. We considered three aspects: academic school approaches; student perceptions; and core processes. Academic staff discussed the approaches taken within their school and how they highlighted these to their students. Working with a Student Intern, students were consulted via an online survey and a series of focus groups to gain their perspectives of the links between teaching and research. Finally, the institutional approaches were discussed with colleagues in the Learning and Teaching Development Service. This presentation will outline key findings from the study, with a focus on activities in biological sciences. Both broad-scale and programme-level approaches were used by academic schools that ranged from whole programme curricula being driven by research excellence to individual modules focused on a specific research area

to single sessions delivered by research-active academics. Student responses to the online survey and focus group questions revealed similar themes on links between teaching and research. Students were generally positive, with them recognising the benefits of being taught by research-active academics and agreeing that their teaching was informed by research occurring within their school and that overall, research had a positive impact on teaching quality. We will conclude with recommendations and considerations needed to fully develop our links between teaching and research.

SEB+.5 WHY SHOULD WE THINK BEYOND SKILLS AND KNOWLEDGE WHEN WE DESIGN RESEARCH BASED LEARNING ACTIVITIES?

📅 MONDAY 3 JULY, 2017 ⌚ 10:40

👤 GRAHAM SCOTT (UNIVERSITY OF HULL, UNITED KINGDOM), DOMINIC HENRI (UNIVERSITY OF HULL, UNITED KINGDOM), STUART HUMPHRIES (UNIVERSITY OF LINCOLN, UNITED KINGDOM)

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The benefits to students of research-based learning are probably well understood. Through participation in research students acquire important disciplinary skills and knowledge. However, we believe that for research based learning to be wholly successful we need to think beyond skills and knowledge and consider the wider student experience. Reflecting on evaluations of student involvement in research based learning in a field course context we consider the roles of expectation, experience and engagement as drivers of student engagement.

SEB+.6 OPPORTUNITIES AND TENSION POINTS ASSOCIATED WITH COURSE-BASED UNDERGRADUATE RESEARCH EXPERIENCES FROM STUDENT AND FACULTY PERSPECTIVES

📅 MONDAY 3 JULY, 2017 ⌚ 14:00

👤 SARA E BROWNELL (ARIZONA STATE UNIVERSITY, UNITED STATES)

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Calls for more broadly integrating research into the undergraduate curriculum have sparked the development of course-based undergraduate research experiences (CUREs). In a CURE, students engage in the process of research in a formal lab course by exploring a question with an unknown answer that is of relevance to the broader scientific community. The dual functions of a CURE - as a learning opportunity for students and a research generating opportunity for faculty - create unique opportunities and tension points that have yet to be fully explored.

We have created a conceptual framework surrounding the opportunities and tension points associated with CUREs from a student and faculty perspective. This framework considers how student and faculty benefits may be in conflict, how the intersection of research goals and learning goals may create tension in a course that

students take for credit, and how the authenticity of research may be dampened by the structural elements of the course. This conceptual framework posits that the tension points surrounding CUREs may limit either some of the research productivity of a CURE or some of the student benefits associated with CUREs. Thus, as we move into the next phase of CURE implementation, we may need to carefully consider the ethical implications of conducting research in the context of a credit-bearing course before rushing to CURE lab courses.

SEB+.7 BROKERING ACTIVITIES BETWEEN TEACHING- AND RESEARCH-FOCUSED LIFE SCIENCE ACADEMICS

MONDAY 3 JULY, 2017 **14:40**

ANNE M TIERNEY (EDINBURGH NAPIER UNIVERSITY, UNITED KINGDOM)

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One of the recent developments in higher education is the emergence of the teaching-focused academic, who is being employed in many UK universities as an indirect consequence of the pressures of the Research Excellence Framework (REF). Teaching-focused staff in many universities have evolved from teaching assistants with temporary employment, to academic staff with parallel career paths to that of the research-focused academic. For many, the transition or choice to pursue a teaching-focused career path in higher education is a positive one, and there is much to commend this institutional approach. However, the focus on teaching and scholarship may result in a loss of currency with up to date disciplinary knowledge and associated skills. This may impact on one's confidence in teaching in a research-led way. This presentation seeks to uncover the possibilities of brokering activities between research-focused and teaching-focused academics, and how the exchange of disciplinary and pedagogic expertise can be facilitated.

SEB+.8 WHO GOES WHERE? THE IMPORTANCE OF FRIENDSHIP GROUPS IN THE LECTURE THEATRE

MONDAY 3 JULY, 2017 **14:55**

DAVID P SMITH (SHEFFIELD HALLAM UNIVERSITY, UNITED KINGDOM), MELISSA LACEY (SHEFFIELD HALLAM UNIVERSITY, UNITED KINGDOM)

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A large proportion of University teaching occurs in lecture theatres. The quality and effectiveness of this approach is often questioned but is likely remain a foundation of the learning experience. To enhance this approach active learning methods are often used within this environment with the assumption at students will engage. To understand the where students locate within a room and their level of engagement, a longitudinal study of first and second year Bioscience students was performed. Students were asked to identify where they sat and comment on the reason they sat there. Data was mapped at a seat specific level and correlated with engagement with the module and final attainment. In parallel staff perceptions of student attainment and location was also obtained. The comments

from staff indicated a preconceived perception of the student body, identifying certain regions of the room likely to seat students with a given attainment. Contrary to this the data from the study showed no correlation with student location and attainment. However the data did demonstrate that student's course work marks cluster in groups of attainment. These groups are made up from students on the same course stating they are sitting where they are because they are "with friends" with one member of the group giving a clear reason for sitting in that location. The outcomes from the study will enable lectures to better understand the student body and inform the way in which teaching sessions are performed and how problem solving approaches can be incorporated.

SEB+.9 DIVING IN TO THE TEACHING-RESEARCH NEXUS: A CROWD-SOURCING WORKSHOP

MONDAY 3 JULY, 2017 **15:10**

LUCY TALLENTS (UNIVERSITY OF OXFORD, UNITED KINGDOM)

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Involvement in authentic research is a transformational learning experience for students. Learning activities that explore the limits of current knowledge can harness students' intrinsic curiosity, and encourage them to feel part of a community of practice. Activities at the teaching-research nexus range from simply sharing your latest findings within the context of the curriculum, right through to working with students in any stage of active research from developing the next big question to publishing papers together. We know that inquiry-based learning is a great way for students to develop their professional and personal skills, but how can we also benefit from enhancing that connection between our research and teaching? This crowd-sourcing workshop will focus on how to better embed research in your teaching, and how to involve students in your research. Working in small groups, you'll brainstorm, investigate and share ideas, and reflect on how they align with a conceptual framework of inquiry-based learning. By reviewing another group's ideas, you'll develop a broader appreciation of the opportunities available to you at the interface of teaching, learning and research. You'll take away ideas which can work immediately within your own situation, and also be aware of opportunities which might need wider course-based changes or institutional support to make happen.

SEB+.10 STUDENT PERCEPTIONS OF THEIR AUTONOMY AT UNIVERSITY: THE MOVING GOAL-POST MODEL

MONDAY 3 JULY, 2017 16:10

DOMINIC C HENRI (UNIVERSITY OF HULL, UNITED KINGDOM), LESLEY MORRELL (UNIVERSITY OF HULL, UNITED KINGDOM), GRAHAM SCOTT (UNIVERSITY OF HULL, UNITED KINGDOM)

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Learner autonomy is a primary learning outcome of Higher Education in many countries. However, empirical evaluation of how student autonomy progresses during undergraduate degrees is limited. We surveyed a total of 636 students' self-perceived autonomy during a period of two academic years using the Autonomous Learning Scale. Our analysis suggests that students do not perceive themselves as being any more autonomous as they progress through University. Given the relativity of self-perception metrics we suggest that our results evince a 'red-queen' effect. In essence, as course expectations increase with each year, each student's self-perceived autonomy relative to their ideal remains constant; we term this the 'moving-goalpost' hypothesis. These results corroborate pedagogical literature suggesting that providing students with opportunities to act autonomously and develop confidence is key to developing independent, work-place-ready graduates.

SEB+.11 TEACHING: WORK BEYOND THE JOB

MONDAY 3 JULY, 2017 16:25

IRINA STRIZH (FACULTY OF BIOLOGY M.V. LOMONOSOV MOSCOW STATE UNIVERSITY, RUSSIA)

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Most readers, teachers and even professors suppose that teaching is just a job that includes traditional lectures, seminars and formal practical or laboratory works. Many of us do have had this "school" and some of us - present "teachers" agree to continue this wave. However, even lazy and not interested in the discipline student do not like this "trade" nowadays. And they also do not want and definitely don't appreciate "fun" in teaching like it was several years ago. Students are more pragmatic nowadays and they want to have much more experimental practice and methods in hands to get better job next day. I do agree with them. Forcing experimental teaching is not so easy because of the material costs. And sometimes it's not even gratefully for the organizers. All results depend on student's ability and motivation. Worst result: students just avoid the experimental work or make everything wrong so you can get a heartbreak worrying about them. Middle (or the best?!) result is when the student become a nice technician who can perform any experiment that you want so this student definitely can get job anywhere. The best but not so profit result is to teach the student not only working experimentally, but also thinking and planning the own work as well. From my opinion: teaching can't be a job or occupation position - it's a work that got to be done permanently by the teacher and student teamwise.

SEB+.12 WORK INTEGRATED LEARNING: THAT'S WHAT ACADEMICS DO, RIGHT?

MONDAY 3 JULY, 2017 16:40

ROS GLEADOW (MONASH UNIVERSITY, AUSTRALIA)

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Work Integrated Learning (WIL) is a buzz word in education. But how real can these experiences be? What do students learn? How can they be done cost effectively, without being time intensive? We have introduced WIL at several levels: industry internships, research 'apprenticeships', projects based on real-world problems, and simulations. Students definitely learn a lot of important skills. The rewards of seeing undergraduate students transition from knowing about science to being scientists is rewarding for both students and educators but careful design is required if such projects don't end up being intellectual wastelands.

SEB+.13 THE UK UNIVERSITIES NUFFIELD RESEARCH PLACEMENT - THE LUXURY OF LEARNING BY INQUIRY

TUESDAY 4 JULY, 2017 POSTER SESSION

JENNY SNEDDON (LIVERPOOL JOHN MOORES UNIVERSITY, UNITED KINGDOM)

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The UK Science, Technology Engineering and Maths Nuffield summer placement programme is run for A' level students from less privileged backgrounds; the aim of the Programme is to get students that are goal-directed, but not generally exposed to research-led teaching, up the next step of the academic ladder. This could be Oxbridge or entry on any University programme of choice, after completing a 4-6 week University-based placement. <http://www.nuffieldfoundation.org/nuffield-research-placements>.

The Merseyside, Cheshire and Warrington Nuffield Region (run 1994-present) manages 70-130 out of a total of 1000 national summer placements per annum; this is consistently the largest proportion in the UK. Over the past 7 years, students supervised in Natural Sciences at LJMU have displayed academic attainment commonly seen in second or final year undergraduates (n=2-3/year; total 16) in lab, field and IT settings. Proof of competency is evidenced via a group/individual poster presentation at a Regional Nuffield Student conference, a written report, a video demonstration and entry into University of choice. The challenge for lecturers on undergraduate Bio-Science Programmes is to choose elements of the research process that can be extrapolated to large class sizes. The Australian Undergraduate Research Programme (Rowland et al. 2012) and Feltham (2016) claim an element of success in this. Research training methods developed on Nuffield placements map onto on small groups of 6-8 final year Honours project students. How do we extrapolate inquiry based learning to all students who flourish in an open ended learning environment?