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Authors	O'Mahony, Catherine;Deicke, Wolfgang;Hasenknopf, Bernold;Morgan, Wyn;Woodcock, Louise;Erikson, Martin G.
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Towards successful learning: Controversies and common ground

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Author(s)

Name: Catherine O'Mahony
Position: Co-Director, Centre for the Integration of Research, Teaching and Learning
Organisation: University College Cork
Country: Ireland
E-mail address: catherine.omahony@ucc.ie

Short bio:

Dr. Catherine O'Mahony is Administrative Co-Director of the Centre for the Integration of Research, Teaching and Learning (CIRTL) at University College Cork. In this role she coordinates staff professional development activities relating to the enhancement of teaching and learning. She also directs an international professional development programme for visiting lecturers on areas such as teaching enhancement, research skills development and writing for publication. Her research interests include Higher Education Management, Undergraduate Research, Community Based Research and Learning, and the Scholarship of Teaching and Learning. Catherine is also Community Engagement Officer for the University and oversees the implementation of the 5 year Civic and Community engagement plan.

Name: Wolfgang Deicke
Position: Co-ordinator of the bologna.lab
Organisation: Humboldt-Universität zu Berlin
Country: Germany
E-mail address: wolfgang.deicke@hu-berlin.de

Short bio:

Wolfgang Deicke read Sociology and Politics at Hamburg University and later at the Postgraduate School of Peace Studies in Bradford. Before becoming the co-ordinator of the bologna.lab at Humboldt-Universität in 2012, he variedly taught sociology, politics and the history of European thought and society at the (now) University of Northampton, School of Oriental and African Studies in London and Ruskin College, Oxford. In Northampton and Oxford, he gained comprehensive experience in course and curriculum development and the development of curricula for active

learning. His current research interests are the development of (student) research competencies and organisational development in Higher Education.

Name: Bernold Hasenknopf
Position: Professor
Organisation: Sorbonne University
Country: France
E-mail address: bernold.hasenknopf@sorbonne-universite.fr

Short bio:
Bernold Hasenknopf is chemistry professor since 1997 at Sorbonne University (formerly UPMC) in Paris, France. As a teacher, he always engaged in innovative teaching. He took up responsibilities as coordinator of inorganic chemistry, then for the molecular chemistry branch of the Master studies, vice-director of the Master of chemistry, dean of studies of the department of chemistry and now director of the Master of chemistry. He was member of the advisory board for the vice-president of teaching and learning, and of the pilot team for innovative teaching at his university. Currently, he is member of the Academic Council, and board member of the educational support center Capsule in his university, where he is in charge of the coordination of the training programme for professional development of teaching staff.

Name: Wyn Morgan
Position: Vice-President for Education
Organisation: University of Sheffield
Country: UK
E-mail address: w.morgan@sheffield.ac.uk

Short bio:
Wyn Morgan is currently Vice-President for Education and Professor of Economics at the University of Sheffield, posts he has held since 2015. He is responsible for all aspects of learning, teaching, student recruitment and engagement. Previously he worked at the University of Nottingham both as a Professor of Economics and in a variety of leadership roles for teaching and learning. He has always been actively interested in teaching enhancement and innovation, with a specific focus on digital learning, and has been delighted to receive several teaching excellence awards from peers and students.

Name: Louise Woodcock
Position: Head of Academic Practice
Organisation: University of Leeds
Country: UK
E-mail address: l.woodcock@leeds.ac.uk

Short bio:
Louise Woodcock is Head of Academic Practice at the University of Leeds. She is responsible for staff and postgraduate researcher development for learning, teaching and research and a number of associated university wide enhancement activities including career pathways, professional recognition, and digital practice. She previously worked at the University of Sheffield where she was responsible for learning and teaching services, supported the implementation of the learning and teaching strategy and led a variety of learning and teaching enhancement projects. enhancement projects.

Name: Martin G. Erikson
Position: Senior Lecturer
Organisation: University of Boras
Country: Sweden
E-mail address: martin_g.erikson@hb.se

Short bio:
Martin G. Erikson currently works at the Department of Educational Research and Development, Högskolan i Borås. Martin does research in social psychology and higher education. A recent project is 'Qualitative student evaluations.

Proposal

Title: Making research work - institutional supports for research-based learning as a form of active learning

Abstract:
Research-based learning (RBL) is heralded as a particularly impactful practice in Higher Education and an exemplar active learning approach. Yet it can be asked as to whether the student experience matches the rhetoric. Does RBL, in the main, provide students with the chance to engage in the co-creation of knowledge, in keeping with the aspirations of active learning? Or is RBL-lite the reality for time and resource stressed staff and institutions? This paper draws on the learning from an earlier EUA Thematic Peer group on research-teaching linkages and provides insights into institutional arrangements in support of research-based learning. The role of mentoring, transdisciplinary learning and connecting with society will be explored with due consideration for the constraints and enablers for this approach to student learning.

Key words: research-based learning, active learning, curriculum design, institutional initiatives

Introduction

Active learning approaches have been posited as a means for enhancing both the processes and outcomes of student learning in Higher Education. One way of supporting this is the use of research-based learning activities, which gives the student a broader imagining of research and knowledge (see, e.g., Healey et al., 2010; Jenkins et al., 2007, for an introduction to research-based approaches). Research-based learning activities can make students into co-creators of knowledge, as advocated by McCulloch (2009) and which is a core of the educational ideals of Karl Jaspers (1959). Taken further, research-based learning can ensure the inclusion a broader range of stakeholders and the orientation of research towards common societal challenges.

This paper builds on initial learning by members of a 2017 Thematic Peer Group (TPG) which considered how to connect the research and teaching missions of Higher Education (EUA, 2017). The paper provides a lens on research-based learning through sharing examples of institutional approaches to support research-based learning, reflecting on the impact of such approaches and suggesting means by which to navigate the challenges and enact enabling steps and conditions to promote this form of active learning.

The 2017 Thematic Peer Group defined research-based learning (RBL) as:

> *"an approach by which students are actively engaged in inquiry and research. The curriculum contains activities in which students conduct research or engage in authentic processes of inquiry. This can include the development of students' research skills through engaging in research methods courses, or problem-/project-based learning methods and include real cases of analysis and solution. While there are different interpretations and models of RBL, they all share an emphasis of active acquisition of skills and knowledge through research".* (EUA, 2017, pg 4)

This definition recognises that RBL ranges from the initial development of research skills to students' engagement in authentic research projects. This breadth is important as RBL needs to be carefully scaffolded to ensure students have the required skills, understanding and confidence to undertake research as they move from structured or guided projects to open enquiry (Spronken-Smith and Walker, 2010).

There are multiple benefits to RBL. Students are encouraged to take responsibility for their own knowledge and can become more autonomous, self-directed learners. This mode of learning more closely mirrors the ways in which knowledge is created in a discipline and students consequently become enculturated into their discipline and school/department. RBL can also encourage the development of ancillary skills such as critical thinking, complex problem solving, project management and communication, amongst others.

Critique of research-based learning

While RBL currently draws a lot of interest in Higher Education (cf. Bastiaens et al, 2017; Fung, 2017; Linn et. al., 2015; Mieg and Lehmann, 2017), there is little empirical evidence about its effectiveness as a study format. From small-scale pilot studies into projects like Humboldt-Universität's HU-Q programme, researchers were able to draw some conclusions about the settings and components of particularly effective RBL-courses. The participants' research interest and subjective research efficacy (perceived confidence in their ability to conduct research) increased where students reported involvement in a range of different research *activities*, where there was a 'product' (a presentation of work-in-progress or findings) at the end of the process and where students reported that they and their contributions were taken seriously by the researcher supervising the project (Deicke et al, 2014). In a later, more extensive study into the development of student research competencies in the social sciences carried out across thirteen German HEIs, the results indicate that participants in RBL showed no marked differences in their general subject knowledge (research methods, understanding of key concepts) in comparison to their peers who took conventionally taught methods courses. RBL participants - unsurprisingly - demonstrated a slightly better grasp of "applied" methodological issues. Evidence for the researchers' theoretical assumptions regarding the development of affective-emotional aspects of research competencies through RBL (Wessels et al, 2018), however, remained inconclusive.

In many instances the organisation of research-based learning goes beyond standard project supervision and instead moves towards a mentoring relationship requiring a number of additional functions including emotional support and goal setting (Gershenfeld, 2014). Zachary (2002) describes a shift in mentoring away from a product-oriented model focused on knowledge transfer, to a process-oriented model focussed on the application of knowledge and critical reflection. Both suggest a highly teaching-intensive activity with inherent difficulties for scaling up and making available to all students.

Institutional approaches to support research-based learning

During the 2017 TPG exchanges, the group uncovered a few institution-wide activities that fostered active learning through research-based learning (Woodcock and O'Mahony, 2017). The following four case studies provide an insight into some of these approaches.

1. The HU-Q Programme: Students as research mentors at Humboldt-Universität

This challenge of promoting active learning across the institution was addressed in Humboldt University in Germany through the development of student-initiated and student-led research projects known as Q-tutorials. This is an elective option, and open to all students across the University from first year on. Students can submit proposals for an undergraduate research project. The proposals need to be supported by a HU-researcher (who also agrees to accompany the project as a subject expert). The proposals are reviewed competitively by an interdisciplinary commission, the successful projects receive funding in the form of one-year student research stipends worth about €6,200. Successful applicants are employed as 'Q-tutors' and lead a student research team. Before the

projects commence, the Q-tutors work with their peers and expert didacticians on adapting their project to the principles of research-based learning. As a group, they also receive basic training in project management, group moderation and active learning methods. The tutorials usually run for two hours a week for 1-2 semesters and the participants in the research teams receive academic credits for their work. The aim is to involve the participating students in a research cycle – from the development of the research question to the publication of the results. Typically, 36 Q-tutorials are offered each year with 6-15 student participants per team.

Limitations of the Q-Tutorials

As one of three RBL-formats in the Humboldt-Universität's HU-Q Programme, the Q-tutorials are intended to provide a first entry into research-based learning from early on at the Bachelor level. The majority of the proposals come from Humanities and Social Sciences projects, with Natural Science proposals often failing at the first hurdle - securing staff support for their bid. In a number of disciplines, colleagues remain deeply sceptical as to the ability of Bachelor-students to carry out 'proper' research independently. The main purpose of the Q-tutorials, however, is not for students to make an "original contribution" to scientific knowledge, but to independently and systematically explore an area or topic of their own choosing and thereby becoming actively socialised into the scientific community. Another criticism - mainly from the students' perspective - is that the projects, when they work well, quickly become very time and labour intensive. The risk here is that students neglect other, graded and compulsory work in favour of an elective project that has little bearing on their degree classification.

2. Transdisciplinary teams at the Sorbonne University

A difficulty of RBL lies in learning how to deal with complexity, and how to mobilize various resources. The teacher is tempted to rather develop all aspects of his own discipline, and to provide only as simple tools the concepts and methods from other disciplines. The student is then put in the position of following a recipe to solve a problem, without being active in innovation.

Faced with this situation, Sorbonne University (former UPMC) has set up large-scale bi-disciplinary workshops (Chemla et al, 2018). Since 2013, about 1500 students per year are spread over about forty themes taught by two teachers from two different disciplines. The two disciplines are required to solve the given problem, but teachers limit themselves to lecture on their own discipline. Thus, they can develop all concepts and methods with the necessary rigour, and at a pace adapted to the audience. This improves students' disciplinary learning. Where it is necessary to know the other subject to progress further with the resolution of research problem, the teacher refers to the colleague's teaching. It is therefore up to the students to make the connection, by asking the right questions to the two teachers to recover the elements to progress. New knowledge is produced by themselves, since they are the only ones with all the resources in hand. Students work in small groups, and they quickly develop an internal dynamic to share roles, assign tasks and communicate with each other. Beyond knowledge, they thus learn the interpersonal skills essential for research work, or collective work in general.

Limitations of the Transdisciplinary Teams

While teachers appreciate the comfortable position of not having to teach outside their discipline, and widely acknowledge the usefulness of the skills acquired by students, students remain more critical. 42% of them think that this teaching will not be useful to them for the rest of their education. It should be noted that the majority of students cannot choose the theme of their workshop, and their criticism partly reflects the priority they give to learning scientific content over transferable skills.

3. The 10 Billion-Project at Sheffield University: Interdisciplinary solutions to challenges posed by a growing global population

Taking an institution-wide approach to engaging students in research developments, saw the University of Sheffield create an interdisciplinary three-week online course called 10bn. It aimed to provide a multi-disciplinary lens on current research around meeting the challenges that come with a growing global population (10bn). The variety of topics was broad covering the way migration is represented through media and art; the challenges of an ageing population; the issue of social justice; how we tackle climate change; how we ensure food security for the future. By exposing students to different views of the same subject that draws on specific disciplinary knowledge, the course opens up opportunities to engage in widening understanding of common topics, and an appreciation of the relevance of various disciplinary perspectives and approaches. Crucially though it continues to emphasise those skills which are core to the outcomes of their own disciplines and would be relevant throughout their studies, namely critical thinking, cross-disciplinary communication, peer review and evaluation and reflection.

One common starting point for active and engaged learning and teaching is to identify topics, themes or subjects that draw directly from the research agendas and activities of the academics in the department or university more widely. In addition, it helps if there are unaddressed questions, and the topics are still actively engaging the researchers themselves. This offers the students the chance to bring their own, new findings to the discussion thus creating a sense of active contribution created through application of their own learning but also building on their enthusiasm too. However, this contribution is not done in isolation; in fact the opposite is often true with collaboration across disciplines and between students and academics and given the students' role as co-researchers and partners, they are frequently engaged in the development and direction of learning and teaching.

Limitations of the 10bn project

The concept of 10bn fitted clearly with a desire to enhance the student learning experience while at Sheffield. However, there were some difficulties experienced in delivering the course and in 2017 it was decided to discontinue it. Those students who did engage produced some very inventive and creative learning objects to reflect their learning proving the value was there but not at the scale desired. On reflection one of the major challenges was that the course was taken on a voluntary basis and "outside" the curriculum - in that there was no credit towards the final degree outcomes - meaning that uptake was lower than would have been ideal. Clearly, the wider benefits of the

approach could not be communicated effectively enough to overcome this prosaic but significant barrier.

4. Co-creating solutions to shared problems at University College Cork

Active learning approaches can ensure that the student moves from a passive recipient of knowledge to becoming an active participant in creating knowledge and meaning-making. RBL activities that have moved towards more open enquiry approaches can ensure that students are operating at this level (Spronken-Smith and Walker, 2010). Uncovering new areas for research can itself be a highly specialised activity, and new possibilities for research can develop from projects focussed on addressing challenges experience by broader society or through partnering in research with civil society actors. This reorienting of research towards society can have additional motivational benefits for students and help activate their learning. Activities need to be carefully thought out as these problems are by their nature intransigent and volatile. The temptation may then be to revert to structured or guided research activities in order lessen the risks within the project, but to the detriment of developing students sense of agency and self-direction.

University College Cork has diversified where research questions come from through its Community-Academic Research Links (CARL) initiative. CARL is based on the European "Science Shop" model and works in partnership with Civil Society Organisations (CSOs) to identify potential research topics that can be pursued in partnership with students across all academic disciplines. The student conducts the research, under academic supervision, as part of their course work and addresses a research question posed by the CSO. The extent to which the projects are truly collaborative can vary. In some projects the student acts as a contracted researcher, in others the CSO representatives are co-researchers on the project with the student and engage in all steps of the research process. There is a requirement for the student to ensure that the research findings are presented in a readily digestible format and that the student maps out the next steps leading from the research findings in collaboration with the CSO. This last step is crucial as it aims to ensure that the research can be utilised to effect change for the organisation.

Limitations of the CARL initiative

While the CARL initiative aspires to co-construction of knowledge with CSOs, true participation is often illusive due to competing demands on the CSO, perceptions regarding research capacity, and the privileging of certain types of knowledge over others (O'Mahony, 2015). This approach to research requires the development of strong partnerships with community organisations based on principles of reciprocity and collaboration, as well as capacity building of all actors to support a participatory approach to research. This takes time, requires considerable resources and an institutional commitment in order to build and sustain. Students also need to be supported and guided to ensure that they integrate the learning from these initiatives or, as McGowan (2013) warns, "*miseducative experiences in the community may reinforce negative student assumptions of internalized stereotypes*" (pg 8).

Making research work - reflections on institutional constraints and enablers

The above examples suggest a cautious approach to RBL as a particularly time- and resource-intensive format for both students and staff involved. When developing RBL activities thought should be given to whether RBL is an elective or compulsory activity, the number of credits assigned to RBL activities to reflect the potential increased workload, how best to scaffold and support student learning so that they have sufficient understanding and skills to engage successfully in a RBL activity, how to design assessments which mirror research outputs and processes, whether RBL should be embedded within the curriculum or available as an extra or co-curricular activity, whether students should partner with community organisations to broaden the impact of learning through research and inquiry, amongst other considerations (Spronken-Smith et al, 2011).

It is therefore useful to remember that RBL is but one of many forms of active learning and should not be overburdened with expectations, particularly expectations of "more effective" learning. While it may be true that RBL - implemented in a particular way - can also help students to develop their teamwork and communicative skills and teach them something about negotiating outcomes with third parties as a by-product of research, there may be other, less resource-intensive forms of active learning to develop these skills purposefully and directly. Research-based learning, in our view, has its specific strengths in helping students to develop their research interests and skills. That said, for research-active staff and institutions, RBL provides a pathway for combining or re-joining the two increasingly disparate aspects of academic life: research and teaching.

A key enabler for promoting active learning is the inclusion of specific reference to active learning, including research-based learning, in institutional strategies and an associated plan for realising these goals. Such a plan should address specific issues such as staff time, resources and development, and be explicit with regards to the ways success will be evaluated and recognised. To help foster staff engagement and institutional buy in, both of which are critical for sustaining change, the strategy is ideally informed by existing good practices within the institution. For lasting impact, it is essential to address any challenges or barriers in a holistic and systemic way, for example building the requisite support into existing staff development provision, addressing any administrative or process related matters which inhibit inter-disciplinary working and/ or working with external organisations, and ensuring that mechanisms for rewarding and recognising staff are embedded in the formal reward and promotion structures. This may go some way to ensuring that RBL and active learning approaches move beyond the rhetoric to being truly transformative forms of student learning.

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