

Research-based Education Meets MELT: Co-created Classrooms for the 21st Century.

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Abstract

“Partnership in learning and teaching is a way of staff and students learning and working together to foster engaged student learning and engaging learning and teaching enhancement.” (1) p.15

This paper focuses on emerging practices in co-creating curriculum at the University of Adelaide. Our three case studies will demonstrate different aspects of the research-teaching nexus: course design, learning and teaching activities, assessment tasks, and learning outcomes (2). These activities have been identified as key to infusing research practices and experiences into student learning (3). The University of Adelaide has made substantial progress in incorporating research-based education (RBE) into the curriculum across all undergraduate programs and thus the Research Skills Development Framework (RSD) has been central to scaffolding undergraduate students' experience of research. Since 2014, all students have undertaken small group discovery experiences (SGDE) in every year of their program (4). Use of flipped classroom techniques makes space in the curriculum for enquiry-based and self-regulated learning (5). A focus on career readiness has seen increased attention given to the development of generic graduate attributes alongside deep content knowledge and skill acquisition (6). We are seeking to engage more meaningfully with students as partners in their learning, which has led to the emerging practice of co-created curricula. In this paper, we will discuss our experiences in using curriculum co-design across different aspects of RBE using a fusion of Design Based Thinking (7) and the Active Cognitive Engagement (ACE) Pentagon (Fig. 1). Three diverse case studies will be discussed and key common features of these co-creation exercises will be presented.

Introduction

Engaging tertiary students in research-based education has been shown to improve learning outcomes across a variety of disciplines (8). However, even embarking on the research process can be daunting to

undergraduate students. The use of a transparent and easy-to-follow framework can improve the accessibility of research; we used the Design Thinking Framework and MELT frameworks (Fig. 1), which share many features and provide complementary benefits with regard to engaging students in a research-based co-creation activity. These frameworks provided the basis for our three co-creation case studies that focused on assessment, course design and learning activities.

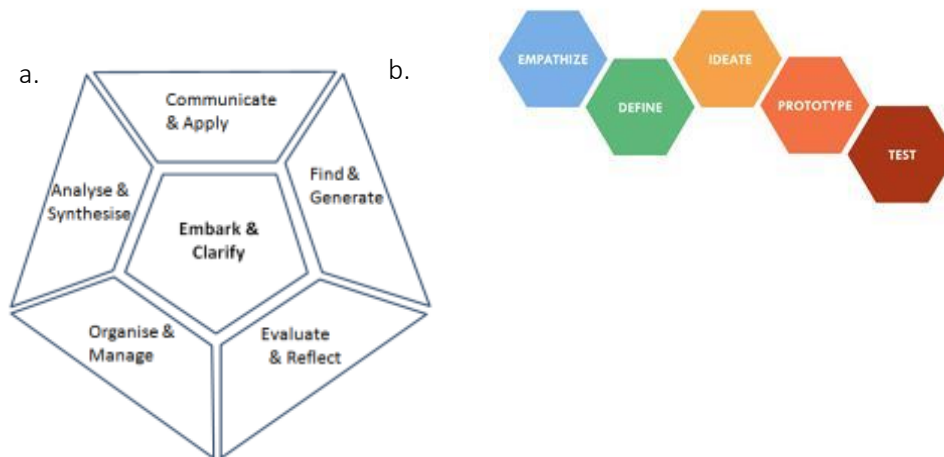


Figure 1: (a) Active Cognitive Engagement (ACE) pentagon; (b) Design Thinking Framework. See <http://www.adelaide.edu.au/rsd/framework/frameworks/> and <https://dschool.stanford.edu/groups/designresources/>

Successful co-creation requires that the ideas and opinions of both staff and students are valued equally, where clear communication and goals facilitate the co-creation of course content. Both the ACE pentagon and Design Thinking Framework allow this by guiding participants through a process of **empathising** with one another, allowing them to **embark and clarify** or **define** the particular problem to be solved. Participants are then able to **ideate** or **find and generate** possible solutions. Our three case studies show the variety of outcomes that can be achieved by providing clear guidelines to participants in co-creation initiatives. Focus groups critiquing the three exemplars of practice have developed a set of best practice guidelines for co-creation.

Case Study 1: Students as Partners in Research-Based Assessment Design

In 2016 a new course, Plant Production and Global Climate Change, was proposed, as part of a new degree program (Bachelor of Applied Biology). It provided an excellent opportunity to use co-creation methodology and the ACE pentagon to structure an assessment design workshop. Second and third year

students and academic staff participated in a co-creation workshop focused on designing a specific assessment task. Participants working in groups with a student:staff ratio of 4:1 **embarked** on the process by **clarifying** the broad learning outcomes to be achieved by the assessment task that they were tasked with designing. Prior to attending the workshop, all participants completed a short survey to **clarify** their own feelings about learning, teaching and assessment. In order to begin the design process, it was necessary for participants to **find** common ground between academic staff and students, which they did by way of round table discussions outlining what makes good assessment tasks. This allowed each group to **generate** comprehensive lists of good and poor assessment tasks. Participants were then able to **apply** the listed assessment tasks to the required learning objectives. The groups were asked to develop some structure to support the assessment task by **organising and managing** the key competencies that need to be measured by the assessment. This was achieved by the developing a rubric. Finally, participants were required to **evaluate** the effectiveness of the assessment tasks by cross-checking the rubric with the intended learning outcomes. The assessment task created emphasised both enquiry-based learning and mastery of key discipline specific research skills and methods (8). The use of co-creation and the ACE pentagon resulted in the production of unique student-centred assessment tasks which successfully addressed the learning outcomes. The main challenge for this co-creation activity was ensuring a cross section of students in terms of their engagement, motivation and cultural background.

Case Study 2: Students as Partners in Identifying Best Practice Principles for Enquiry-Based Learning

Enquiry-based learning is an integral part of undergraduate curricula at the University of Adelaide. In a 2016 project to develop good practice design principles for this pedagogy, students and staff worked as partners in a co-creation workshop. Using the ACE Pentagon as a framework to plan, implement and evaluate this co-creation activity was a major factor in its success. Beforehand, 32 undergraduates and 16 teachers **embarked** on the co-creation activity by participating in an online questionnaire to **clarify** the critical 'pros and cons' of their enquiry-based learning experiences. In the subsequent co-creation workshop, they formed 2:1 student: teacher ratio groups to **find** points of agreement and to collaboratively **generate** good practice principles to underpin enquiry-based curricula design. Each group then contributed their findings and **organised** them into a 'meta-list'. These collective outcomes were **applied** in an integral part of enquiry-based learning professional development workshop and form a key **communication** strategy on authentic evidence of what 'works' - and what 'doesn't'. This will allow the professional development participants to **evaluate** the effectiveness of their current approaches to enquiry-based learning. Designing the co-creation workshop to allow students to be equal contributors, not just 'listened to' or 'surveyed' for their opinions was a major challenge. However, the workshop exceeded expectations as the 'tangible' student engagement was only matched by the 'palpable' teacher engagement.



Case Study 3: Students as Partners in Developing Online Learning Resources

Well-designed flipped classrooms create group space learning encounters for enquiry-based learning to effectively support RBE. To facilitate student engagement in learning difficult concepts, this project engaged students as partners to co-create flipped learning resources to support second year students' understanding of difficult clinical concepts. Final year students working with teachers developed guidelines to benchmark effective flipped learning resources for the historically problematic topic of periodontal pathogenesis in clinical practice. Students **embarked** on this co-creation activity by reflecting on aspects of this topic that they struggled with as second year students. Together with their teacher they **clarified** the concepts that would lend themselves to pre-class preparation activities and **generated** student-focused content based on a mastery understanding of the key concepts. Using metacognitive skills on 'learning how to learn', students **organised** content that was deemed suitable for pre-class activities with a focus on key immunological concepts. Selection of technology that would enhance the pedagogy of flipped and self-directed learning of this topic was key to support the organisation and **communication** of the content. In-class activities were linked to the pre-class content, where students worked with peers to **apply** this new-found knowledge to create composite concept maps prior to applying this content to clinically-based scenarios. Finally, the effectiveness of learning periodontal pathogenesis in this flipped format was **evaluated** through formal course evaluation surveys, post topic surveys, student focus groups and, most importantly, outcomes of assessment. While the major challenge has been working around students' timetable commitments, discussions between students and teachers on the co-creation project team have identified common issues that need to be addressed to more effectively engage students in flipped classrooms and enquiry-based learning.

Identifying the Hallmarks of Best Co-Creation Practice

In June 2017 at a research-based education conference at University College London, (9) we presented our three co-created case studies in a seminar format. Participants individually reflected on the impressions of each case study, identifying what aspects contributed to their successful outcomes. Then, working in small groups and using the ACE pentagon to guide discussion, the participants **evaluated and reflected** to develop an agreed list of what could be considered as the hallmarks of successful co-creation. The word cloud shown below (Fig. 2) was subsequently generated by the entire group of 32 participants with the most significant aspects highlighted in larger font. This real-time feedback allowed us to validate the use of the ACE pentagon as a tool for use in cross- and multi- discipline co-creation activities. We will continue to

add to this co-created word cloud at future conferences and workshops to develop a tool to be used to design effective initiatives in co-creation.



Figure 2: Hallmarks of Co-Creation Success – co-created outcomes of a seminar held at the Connecting Higher Education conference, University College London, June 2016.

Conclusion

Successful co-creation using a framework such as the ACE Pentagon or Design Thinking Framework can lead to the development of rich learning experiences that both engages students and enhances teaching. The three case studies featured in this paper demonstrate the diversity of co-creation application in learning and teaching. The key aspects that contribute to these successful co-creation activities can be seen in a word cloud created during a large group discussion at a recent seminar in June 2016 (Fig 2.). Importantly, it can be seen that having a clear *structure* around which participants can focus their thinking is central to success. *Collaboration* and *understanding* are equally important and both the ACE pentagon and Design Thinking Framework provide the structure to support staff and students in co-creation. Future contributions to these hallmarks of success have the capacity to assist co-creation designers to plan and implement meaningful and valuable activities where students and teachers work together in a true partnership.

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