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Research Based Education Meets MELT: Co-created Classrooms for the 21st Century
Research based education meets MELT
Co-created classrooms for the 21st century
Beth Loveys, Cathy Snelling and Sophie Karanikolas
Introduction

• Using three distinct case studies we will demonstrate how the research-teaching nexus can provide an ideal environment to embrace co-created curriculum
• Research-based education (RBE) has been embedded into the curriculum
• Research Skills Development Framework (RSD) has been central to scaffolding undergraduate students’ experience of research
• Active Cognitive Engagement (ACE) Pentagon has provided the framework for curriculum co-design across different aspects of RBE
Active Cognitive Engagement (ACE) Pentagon – to achieve a common goal

**Embark and clarify** - do we all understand what we need within our context. What is our problem/challenge? Can we narrow down our problem and define it.

**Find and generate** - find common ground and shared goals to generate knowledge/resources

**Communicate and apply** - share ideas and apply them to specific scenarios or assessment or curriculum development

**Organise and manage** - ordering and sequencing of content delivery, assessment and learning outcomes

**Analyse and synthesise** - what outcomes are desired? How are they achieved?

**Evaluate and reflect** - the effectiveness of co-created content can be formally evaluated via feedback and reflection from staff and students

**Find and generate** - find common ground and shared goals to generate knowledge/resources
Case study 1
School of Agriculture Food and Wine,
The University of Adelaide

- Plant Production and Global Climate Change III, was proposed in 2016
- Opportunity to use MELT and co-creation methodology.
- Second and third year students and academic staff participated in a co-creation workshop focused
- Aim to designing a specific assessment task
- Learning outcomes already prescribed
Recruiting staff and students

- 37 students invited, 20 students attended
- 6 staff invited, 5 staff attended
- Staff:student, 1:4
Pre-workshop survey

1. What three words best describe you as a learner?
2. What is one of the best experiences you have had in one of your courses?
3. What is one of the worst experiences you have had in your courses?
4. Rank the following in order of most important to least important in terms of making a good university course:
   - Online content
   - Staff
   - Course organisation
   - Peers
   - Face to face content
   - Type of assessment
   - Group work
5. What sort of assessment tasks are most valuable to you as a learner?
The co-creation workshop
What can we achieve today?

• What students have told me:
  – They wanted to know more about climate change and plant responses
  – Assessment is probably the most important but also the most stressful part of a course

• Our aim is to design an assessment task that meets the needs of students and teachers

Definition:
In education, the term assessment refers to the wide variety of methods or tools that educators use to evaluate, measure, and document the academic readiness, learning progress, skill acquisition, or educational needs of students.
Pre-workshop survey results

**Best experiences** | **Worst experiences**
--- | ---
Hands-on, practical | Unhelpful staff
Relevant | Exam hurdles
Well organised | Disorganised
Quizzes and tests | Poor delivery

Most valuable assessment:
- No group work
- Mixture of assessment types
- Online tests and quizzes
- Practical, hands-on, field trips
- Resubmission
- Heavy exam weighting
During the workshop

Activity 1. The assessment task

<table>
<thead>
<tr>
<th>Assessment task</th>
<th>Learning Objective assessed</th>
<th>Percentage weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>- Describe how the climate is changing and explain the natural and anthropogenic causes for climate variation.</td>
<td>20%</td>
</tr>
<tr>
<td>Literature Review and workshop participation</td>
<td>- Understand the implications of changing climate on plant production in a range of cropping systems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Source and critically analyse relevant peer reviewed literature.</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>- Describe how climate change impacts on key plant processes such as phenology, photosynthesis, respiration and growth.</td>
<td>20%</td>
</tr>
<tr>
<td>Practical report or similar?? What do you think??</td>
<td>- Understand the implications of changing climate on plant production in a range of cropping systems</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Online Pre-prac activities</td>
<td>15%</td>
</tr>
<tr>
<td>1.</td>
<td>Final exam</td>
<td>45%</td>
</tr>
</tbody>
</table>

Activity 2. The rubric

What will a student need to know to complete your assessment?
What information needs to be provided?

<table>
<thead>
<tr>
<th>Criteria 1</th>
<th>Demanding achievement</th>
<th>Good achievement</th>
<th>Fair achievement</th>
<th>Poor achievement</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Criteria 2</td>
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<tr>
<td>Criteria 3</td>
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</tbody>
</table>

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During the workshop
What did the students come up with?

• Pre-practical activity
• Break the assessment up so that student get some feedback during a content module
• Provide some choice in assessment type
• Use guided question to focus discussion

**Part A**

- **Option 1** - Introductory and methods details will be tested by 2 short online tests and quizzes
- OR
- **Option 2** - Prepare an instructional lesson delivered by students for students

**Part B**

- **Option 1** - The results (graphs and tables), discussion and conclusions will be assessed by a written report
- OR
- **Option 2** - The results (graphs and tables), discussion and conclusions will be assessed by an oral presentation

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Intended learning outcome

• Describe how climate change impacts on key plant processes such as phenology, photosynthesis, respiration and growth.
• Describe the implications of changing climate on plant production in a range of cropping systems.

Assessment task (Practical report)

Practical report with optional modes of assessment (written, oral presentation or video submission). Focus on links between climate, physiology and growth.

Teaching and learning activity (Practical experimental activity)

• Measure plant growth responses
• Learn to use scientific equipment
• Experiential learning and observation of plant responses to climate
• Group work

Constructive alignment with pre-existing learning outcomes is possible using a co-creation approach
Outcomes

• The assessment task:
  – Emphasised both enquiry-based learning and mastery of key discipline specific research skills and methods

• Co-creation resulted in:
  – Production of unique student centred assessment tasks
  – Successfully addressed the learning outcomes.

• The main challenge:
  – Ensuring a cross section of students in terms of their engagement, motivation and cultural background

“That looks awesome. I really like the option section and if I was presented with this assessment task I would be stoked :) Great effort!

Thanks for doing this! Its so good to see that you care about teaching, and you are always on the hunt for improvements.”
What was the most difficult concept to learn?
Co-created Pre-class Learning Activities

https://www.youtube.com/watch?v=RaK3aBryqqg&t=29s
Pre-class activities form the basis of the in-class group application activities.
The group learning process in-class

"Gives a real sense of teamwork being able to collaborate with peers and help each other understand."

"Visual aids or drawing or building some of the more elaborate concepts, getting hands on – loved it!"
Evaluate

1. Participation rates

Completion rates 93%

2. Survey Responses

3. Assessment outcomes (Previous Failure rates 20-30%)

<table>
<thead>
<tr>
<th>Grade</th>
<th>HD</th>
<th>D</th>
<th>C</th>
<th>P</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>% students</td>
<td>37</td>
<td>35</td>
<td>20</td>
<td>7.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>
Focus Group Outcomes

• 2017 BOH 10 students
• 100% agreed that
  – the in-class activities were helpful in learning the content.
  – the hands-on tasks and group work were particularly helpful
  – the pre-class activities made sure everyone was up to speed and at the same level, allowing for an effective in-class group learning experience.
Focus Group Outcomes

• “created a comforting environment in which no question was too silly. I feel comfortable asking questions in traditional lectures, and large tutorial groups.”

• 100% students felt that the group work and pre-class materials helped motivate them to learn the topics. They felt that group work in class was effective because it made them want to participate.

• Students enjoyed the peer produced content. They commented that sometimes teachers know the content so well that it is hard for them to relay it to a student in an easy to understand way. They felt that the other students were able to do this very well.
Case study 3
Faculty of Health and Medical Sciences, The University of Adelaide
Setting the scene

• **Aim:** to develop ‘best practice’ guidelines for Small Group Discovery Experience (SGDE) activities

• **48 participants**
  – (2:1 student:staff ratio)
  – 3 hour workshop

• **Initial discussion on their own SGDE role and experience**
Starting with the basics

Initial task was for each group to answer a series of online questions about how the structure and design of an SGDE – eg, size of grps, assessment approach

https://www.surveymonkey.com/r/SGDEcodesign1
Real time responses

How should SGDE groups be initially

How is SDGE best assessed? Select one of the choices below

Answered: 17  Skipped: 0

- Individual mark
- Group mark
- Peer assessment
- Application of learning should be assessed in a summative assessment
- Should not be assessed
- Other (please specify)

Other (please specify) 70.59% 12

Answer Choices

- Individual mark 0.06% 0
- Group mark 0.06% 0
- Peer assessment 0.06% 0
- Application of learning should be assessed in a summative assessment 5.88% 1
- Should not be assessed 0.06% 0
- Other (please specify) 70.59% 12

Answer Choices

- Assigned by teaching staff
- Self-selected by students
- This aspect is not important

Face-to-face
- 50% individual/50% group mark 23.53% 4

Online
- Should not be assessed 0.06% 0
After each group collated and shared their ‘pros’ and ‘cons’, they were asked to work together to generate ideas on how to create more enriching and engaging SGDE experiences.

https://www.surveymonkey.com/r/SGDEcodesign2
A co-created prototype

Outcomes of Co-Creation Workshop

Valuable and Effective Aspects
- Industry insight – ‘real’ perspectives
- Authentic assessment
- Real world application
- Putting theory into practice
- Small groups (<10)
- Interaction between staff & students
- ‘Novel’ – not just another lecture or tute

Least Effective Aspects
- No structure or clearly defined outcomes
- Groups too large
- Not assessed – no incentive to participate
- Dysfunctional groups/uneven workload
- Mundane ‘meaningless’ activities
- Replication of tutorial – didn't feel ‘special’
- No practical application to discipline
  - "Why are we doing this?"
Outcomes of our co-creation

Planning (more) engaging and effective SGDE in your courses