How to develop competency outcome-based co-operative work-integrated curriculum: Lessons learned from universities in Australia

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Phitsanulok Province
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Deputy Vice-Chancellor (Education)
Outline

– Supporting national and local frameworks for an outcome-based approach to education are helpful

– The research evidence supports a variety of approaches to impactful work-integrated educational practice

– Developing outcomes-based work integrated curriculum initiatives at the University of Sydney: a case study
National and local frameworks

A focus on program-level learning outcomes
- National: cycle of University re-registration by TEQSA
- University: (self-)accreditation of academic programs
- Professions: program accreditation

Program-level educational outcomes take account of:
- The national Higher Education Standards Framework
- The Australian Qualifications Framework
- University aspirations for broad learning outcomes
- Discipline- or field-specific outcomes

The role of co-operative work-integrated curriculum:
- To draw on authentic experiences to build and assess broad learning outcomes
What co-operative work integrated educational practices have impact?

– We know that all of the following impact on the depth of learning and/or the development of skills in critical thinking:

  • Interactive and collaborative learning designs
  • Practical application in authentic settings
  • Authentic problems and projects
  • Interdisciplinary contexts
  • Cross-cultural settings
  • High levels of challenge
The University of Sydney: a case study of focus on outcome-based cooperative work integrated education
We were responding in part to this …

‘… almost five million Australian jobs – around 40 per cent of the workforce – face the high probability of being replaced by computers in the next 10 to 15 years’

‘Today, being educated increasingly …. means having the attitudes and behaviours that enable one to adapt quickly to changed circumstances’

‘ …most interviewees felt that skills and training did not extend sufficiently beyond STEM to meet the needs of innovation in a rapidly changing world’
And also to this …. the 2014 undergraduate degree profile
The University of Sydney: a case study

### Graduate qualities: foundations for leadership

<table>
<thead>
<tr>
<th>Graduate qualities</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Depth of disciplinary expertise</strong></td>
<td>To excel at applying and continuing to develop disciplinary expertise</td>
</tr>
<tr>
<td>Broader skills:</td>
<td></td>
</tr>
<tr>
<td>• critical thinking and problem solving</td>
<td>To increase the impact of expertise, and to learn and respond effectively and creatively to novel problems</td>
</tr>
<tr>
<td>• communication (oral and written)</td>
<td></td>
</tr>
<tr>
<td>• information/digital literacy</td>
<td></td>
</tr>
<tr>
<td>• inventiveness</td>
<td></td>
</tr>
<tr>
<td><strong>Cultural competence</strong></td>
<td>To work productively, collaboratively and openly in diverse groups and across cultural boundaries</td>
</tr>
<tr>
<td><strong>Interdisciplinary effectiveness</strong></td>
<td>To work effectively in interdisciplinary (including inter-professional) settings and to build broader perspective, innovative vision, and more contextualised and systemic forms of understanding</td>
</tr>
<tr>
<td><strong>An integrated professional, ethical and personal identity</strong></td>
<td>To build integrity, confidence and personal resilience, and the capacities to manage challenge and uncertainty</td>
</tr>
<tr>
<td><strong>Influence</strong></td>
<td>To be effective in exercising professional and social responsibility and making a positive contribution to society</td>
</tr>
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</table>
The Sydney undergraduate experience

**Academic rigour**
- Depth of expertise in primary field
- Learning from world-leading experts in the field
- Increasing challenge

**Global perspectives**
- Cultural competence
- 50% mobility target
- Language, service learning options

**Cross-disciplinary learning**
- Expertise in a second field (combined degrees, shared pool)
- Open Learning Environment
- Interdisciplinary experience

**Real-world projects**
- Authentic and challenging industry, community, research and/or entrepreneurship projects
- Placements and internships options
2018 Bachelor degrees

**Liberal arts and science**
- Arts
- Commerce
- Liberal Arts and Sciences
- Science
- Advanced Studies

**Professional**
- Advanced Computing
- Applied Science
- Architecture & Environments
- Design in Architecture
- Education
- Engineering (Honours)
- Laws
- Nursing
- Pharmacy
- Pharmacy and Management
- Project Management
- Psychology
- Social Work

**Specialist**
- Design Computing
- Economics
- Music
- Oral Health
- Veterinary Biology
- Visual Arts
A core component of curriculum: Industry and community project units (ICPUs)

- Projects are identified by partner organisations

- The University compiles teams of students with an appropriate discipline mix to undertake each project

- Provide an opportunity for students to utilise their disciplinary expertise, working alongside others with different forms of expertise, to address an authentic, contemporary challenge or opportunity

- Support the development of graduate qualities, especially:
  - Critical thinking and problem solving
  - Inventiveness
  - Cultural competence and interdisciplinary effectiveness
  - An integrated professional, ethical and personal identity
  - Influence
# Some Industry Projects Semester 1, 2018

<table>
<thead>
<tr>
<th>Project</th>
<th>Partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disconnecting from the grid</td>
<td>AGL</td>
</tr>
<tr>
<td>Engaging Chinese visitors</td>
<td>Art Gallery of NSW</td>
</tr>
<tr>
<td>Diversity in Australian workplaces</td>
<td>Bain</td>
</tr>
<tr>
<td>Resettlement of asylum seekers and refugees</td>
<td>Career Seekers</td>
</tr>
<tr>
<td>The future of performance</td>
<td>City Recital Hall</td>
</tr>
<tr>
<td>Data analytics for decision support in the Dairy Industry</td>
<td>Data61</td>
</tr>
<tr>
<td>Development and ownership of green space</td>
<td>Glebe Community Development</td>
</tr>
<tr>
<td>Auction system for the Sydney Produce Market</td>
<td>NSW Farmer’s Association</td>
</tr>
<tr>
<td>Meet me in court – mock trial</td>
<td>NSW Police</td>
</tr>
<tr>
<td>Diversity in leadership</td>
<td>Public Service Commission</td>
</tr>
<tr>
<td>The impact of artificial intelligence (AI) on banking</td>
<td>Westpac</td>
</tr>
<tr>
<td>Impact on the healthcare workforce with emerging technologies</td>
<td>Westmead Precinct</td>
</tr>
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</table>
Example of a project brief: 
Auction system for the Sydney Produce Market

Can switching from a traditional market set up versus a technology focussed auction system deliver a higher price for producers? Almost one-third of Australia’s population, consume the fresh produce sold through the Sydney Produce Market. It caters primarily to professional buyers from supermarkets, restaurants and green grocers but is also open to the public. In this project the group will make a recommendation on the best system, traditional market or auction system, to deliver the highest price for the producer. The group will look at the perishability and value of goods being sold, the number of buyers and sellers, and their characteristics, the benefits and risks of the various systems and the cost of switching to an auction system. Tradition versus technology will determine the outcome.
We are serious about evaluation

Tailored evaluation of project units
  • Student perceptions on quality of experience, academic input from coordinators and facilitators
  • Student perceptions of development of graduate qualities

Annual national surveys
  • Student perceptions of development of graduate qualities
We are serious about an outcome-based approach for feedback to ourselves, students and employers

- We will measure achievement of graduate qualities, for feedback to:
  • us, on the effectiveness of curriculum design
  • students (and employers)

- Measurement of graduate qualities*:
  • 2018 definitions and identification of components
  • 2018 development of assessment rubrics
  • 2018-19 development of an underlying measurement model
  • 2018-19 pilot with industry and community project units
  • 2020 use across all project- and practice-based units for completing students

- Despite encouragement to embed and develop graduate qualities across the curriculum, we expect measurement to lead to further work on embedding development in the early years of the curriculum

*drawing inspiration from the AACU VALUE project
Interim definitions and components of graduate qualities: inventiveness

Definition

— *Inventiveness* is generating novel ideas and solutions.

Components

— Reimagines and reframes disparate ideas, observations or resources
— Creates novel, ideas, solutions or actions
### Interim rubrics for assessing graduate qualities: the example of ‘inventiveness’

<table>
<thead>
<tr>
<th>Component</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coming up with ideas and using resources</td>
<td>Below standard</td>
<td>Generates onedimensional ideas and/or adopts resources within disciplinary norms and conventions</td>
<td>Generates and connects similar ideas, and adopts resources within disciplinary norms and conventions</td>
<td>Generates, connects and synthesises multiple ideas, and uses resources outside disciplinary norms and conventions</td>
<td>Generates, connects and synthesises disparate ideas, and draws on resources in a way that demonstrates the ability to transcend and move between disciplinary norms and conventions</td>
</tr>
<tr>
<td>Process and strategy: implementing a plan*</td>
<td>Below standard</td>
<td>Follows a poorly organised and evaluated strategy, and/or an inflexible execution of a plan</td>
<td>Follows an organised and evaluated strategy with some gaps, and/or a flexible execution of a plan</td>
<td>Follows an organised and evaluated strategy, and/or an adaptable and reflective execution of a plan. Outputs: developing concepts, solutions, processes or actions</td>
<td>Follows an organised, evaluated and grounded strategy, and an adaptable and reflective execution and evaluation of a plan. Outputs: developing concepts, solutions, processes or actions</td>
</tr>
<tr>
<td>Outputs: developing concepts, solutions, processes or actions</td>
<td>Below standard</td>
<td>Creates outputs that are a copy to something existing, incomplete, not feasible and/or poorly contextualised</td>
<td>Creates outputs that show original aspects, and/or are mostly resolved, practical, and/or contextualised</td>
<td>Creates outputs that are original, and/or are resolved, feasible and appropriately contextualised</td>
<td>Creates outputs that are original, resolved, feasible and contextualised in unique ways</td>
</tr>
</tbody>
</table>

*not necessarily relevant to all disciplines
Interim definitions and components of graduate qualities: interdisciplinary effectiveness

**Definition**

- *Interdisciplinary effectiveness* is the integration and synthesis of multiple viewpoints and practices, working effectively across disciplinary boundaries.

**Components**

- Understanding of multiple viewpoints and practices
- Working effectively across discipline and professional boundaries
- Integrating and synthesising different ways of thinking
- Production of distinctive outcomes
## Interim rubrics for assessing graduate qualities: the example of ‘interdisciplinary effectiveness’

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<tr>
<td>Understanding of multiple viewpoints and practices</td>
<td>Limited recognition, and awareness of diversity within an interdisciplinary team</td>
<td>Acknowledges and respects the diversity of viewpoints that different disciplines bring to collaboration</td>
<td>Enacts ones’ discipline-based academic and/or professional responsibilities while appreciating the ideas, criticisms and amendments contributed by other disciplines</td>
<td>Appreciates perspectives, and identifies likely biases of stakeholder groups/persons in finding solutions</td>
<td>Articulates how diversity of knowledge from differing disciplines, including their organisation, contributes to addressing meaningful but complex problems</td>
</tr>
<tr>
<td>Integrating and synthesising different ways of thinking</td>
<td>Minimal receptivity to different ways of thinking, when collaborating with other disciplines</td>
<td>Demonstrates willingness to integrate new knowledge, skills, and behaviours, as contributed by several disciplines</td>
<td>Demonstrates creativity, flexibility, and the interdependence of various roles/positions in collective problem-solving</td>
<td>Critically analyses one’s own strengths and limitations as well as that of the team’s performance when approaching a solution.</td>
<td>Creatively adapts and contributes to the team’s collaborative practice in order to achieve solutions to complex outcomes</td>
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Interim rubrics for assessing graduate qualities: the example of ‘interdisciplinary effectiveness’

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<tbody>
<tr>
<td>Working effectively across discipline and professional boundaries</td>
<td>Minimal demonstration of standards of respect and values when working with interdisciplinary team members</td>
<td>Establishes respectful and ethical conduct in identifying potential sources of conflicts when working with other disciplines</td>
<td>Seeks and provides timely, sensitive and constructive feedback to colleagues in the context of team culture</td>
<td>Seeks to resolve conflict using an optimal balance between assertiveness, empathy and receptivity, and willingness to find a compromise</td>
<td>Display situational leadership: Understands, interacts, manages and adjusts behaviour of self and others to achieve common goals</td>
</tr>
<tr>
<td>Production of distinctive outcomes</td>
<td>Displays minimal contribution in developing a either a shared vision or achieving collective outcomes</td>
<td>Contributes in developing a shared vision, and engagement in achieving unified goals and outcomes</td>
<td>Applies principles and practice of developing a shared vision, and negotiating the achievement of unified goals and distinctive outcomes</td>
<td>Critically reflects on the teams’ strengths, limitations and suggested improvements when generating a solution to a defined problem</td>
<td>Justifies a collaborative solution to defined problems at the level of structure, process or outcomes</td>
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We are having a similar discussion about the PhD as well…

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<tr>
<td><strong>Depth of disciplinary expertise</strong></td>
<td>expert, world standard knowledge in an area of specialisation, a mastery of relevant research methods, capability to contribute to scholarship and knowledge discovery</td>
</tr>
<tr>
<td><strong>Broader skills:</strong></td>
<td>high level capabilities in critical thinking and problem solving, a commitment to lifelong learning and discovery</td>
</tr>
<tr>
<td>• critical thinking and problem solving</td>
<td>excellent oral and written communication skills relevant to specialist and general audiences</td>
</tr>
<tr>
<td>• communication (oral and written)</td>
<td>evaluate and use contemporary digital tools, resources and technologies</td>
</tr>
<tr>
<td>• information/digital literacy</td>
<td>innovative and creative in response to novel problems, willing to take risks</td>
</tr>
<tr>
<td>• inventiveness</td>
<td>high level capabilities in disseminating research, understanding of own research in a broader context by participating in engagement with end-users of research</td>
</tr>
<tr>
<td>• engagement</td>
<td>plan, manage and deliver research projects effectively</td>
</tr>
<tr>
<td>• project management</td>
<td></td>
</tr>
<tr>
<td><strong>Cultural competence</strong></td>
<td>high levels of cultural competence, including in research practice</td>
</tr>
<tr>
<td><strong>Interdisciplinary effectiveness</strong></td>
<td>work effectively in interdisciplinary settings to develop broader perspective, innovative vision and the capacity to work effectively within national and international research and innovation systems</td>
</tr>
<tr>
<td><strong>An integrated professional, ethical and personal identity</strong></td>
<td>integrity, confidence and resilience</td>
</tr>
<tr>
<td><strong>Influence</strong></td>
<td>professionally and socially responsible and make a positive contribution to society; recognise the implications of own research in a broader societal context</td>
</tr>
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</table>
Summing up

– If we are serious about outcome-based work integrated education, we probably need to:

  – support the development of curriculum and quality frameworks that emphasise educational outcomes

  – rely on evidence wherever possible

  – measure outcomes at a high level and in a way that is meaningful to students, universities and employers
Questions?