From Competencies to Pedagogy

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TRU Sustainability Across the Curriculum Workshop
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Objectives

Participants will be able to:

Propose and design an evidence-based pedagogical approach to fill a gap in sustainable education student competencies for an existing course that they teach.
Outline

- Theory Introduction: Sustainability education & competencies
- **Activity 1** – Think/Reflect
- **Activity 2** – Share so we can pair
- **Activity 3** - Mapping in pairs

**8 Ways to change a course**

- **Activity 4** – Gap Analysis  (Paired Discussion)
- **Activity 5** – Design
Understanding that human systems and natural systems are linked.

Long-term, holistic, and integrative thinking.

Understand that addressing almost all problems related to sustainability requires trade-offs.

Recognize that problems exist in multiple scales, and solutions may be different at different scales.

Recognize that real-world issues are complex and require trans-disciplinary thinking and solutions.
Turning skills and knowledge into a competency

- A competency is more than just knowledge and skills. It involves the ability to address complex issues by drawing on skills, plus knowledge AND values, behaviours, and motives in a particular context.
Can education lead to behaviour change?
Activity 1 – Think/Reflect

- Independently:
  - Choose one of your courses and look at the competencies in table 1 (p. 4-5)
  - Identify and prioritize your top 3 competencies.
  - Record the letters associated with your top 3 competencies on a cue card
### Education for Sustainable Development (ESD) Competencies

(Lozaneoe et al., 2017 Table 1 p. 4-5)

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<td>B.</td>
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<td>D.</td>
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<td>Competences</td>
<td>Principles and Summary</td>
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| Systems thinking                  | • Analysis of complex systems across different scales and domains of inquiry  
• Comprehension, empirical verification, and articulation of a system’s key components, structure, and dynamics  
• Attention to systemic features such as feedback, inertia, stocks and flows, and cascading effects  
• Understanding of complex systems phenomena, including unintended consequences, path dependency, systemic inertia, and intentionality  
• Understanding of connectivity and cause-effect relationships  
• Application of modelling (qualitative or quantitative)                                                                                                     | [21, 27, 48, 53, 56–59] |
| Interdisciplinary work            | • Appreciation, evaluation, contextualisation, and use of knowledge and methods of different disciplines  
• Ability to work on complex problems in interdisciplinary contexts                                                                                       | [21, 53, 60] |
| Anticipatory thinking             | • Envisioning, analysis, and evaluation of possible futures, including scenarios with multi-generational timescales  
• Application of precautionary principle  
• Prediction of reactions  
• Dealing with risks and changes                                                                                                                           | [21, 27, 48, 53, 59] |
| Justice, responsibility, and ethics | • Application of concepts of ethics, justice, social and ecological integrity, and equity  
• Description, negotiation, and reconciliation of principles, values, aims, and goals for sustainability  
• Responsibility for one’s actions  
• Ethics and sustainability of personal and professional behaviour                                                                                      | [21, 48, 53, 59, 60] |
Communication and use of media
- Ability to communicate effectively in intercultural contexts
- Ability to use appropriate information and communication technologies
- Critical consideration and evaluation of media

Strategic action
- Ability to design and implement interventions, transitions, and transformations for sustainability
- Active and responsible engagement in sustainability activities
- Development and application of ideas and strategies
- Planning and executing projects
- Ability to reflect on, and deal with, possible risks
- Organisation, leading, and controlling processes, projects, interventions, and transitions
- Identification of scopes of creativity and participation
- Taking responsibility for motivating others

Personal involvement
- Participation in creating sustainability initiatives
- Willingness and ability to take action
- Willingness to learn and innovate
- Self-motivation
- Initiation of own learning

Assessment and evaluation
- Develop assessment and evaluation standards and guidelines
- Independent evaluations with respect to conflicts of interest and goals, uncertain knowledge, and contradictions

Tolerance for ambiguity and uncertainty
- Coping with conflicts, competing goals and interests, contradictions, and setbacks
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<tr>
<td>Critical thinking and analysis</td>
<td>• Ability to challenge norms, practices, and opinions</td>
<td>[53]</td>
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<td>• Reflection on one's own values, perceptions, and actions</td>
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<td>• Understanding of external perspectives</td>
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<td>Interpersonal relations and</td>
<td>• Participatory and collaborative approaches to solving problems or conducting research</td>
<td>[27, 48, 59, 60]</td>
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<td>collaboration</td>
<td>• Skills and understandings in communication, deliberation, negotiation, empathizing,</td>
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<td>• Ability to deal with conflicts</td>
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<td>• Learning from other perspectives</td>
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<td>• Participation in community processes</td>
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<td>Empathy and change of perspective</td>
<td>• Ability to identify own and external perspectives</td>
<td>[21, 53, 59]</td>
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<td>• Understanding and sympathy for the needs, perspectives, and actions of others</td>
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<td>• Ability to deal with internal and external value orientation</td>
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<td>• Compassion, empathy, and solidarity with others across differences</td>
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<td>• Accepting and embracing of a diversity of opinions, experiences, or perspectives</td>
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Activity 2 – Share so we can pair

- Look at other participants and find someone that has similar priorities and discuss
Activity 3- Mapping in pairs

• Map the pedagogical activities that would correspond to your top 3 competencies according to Figure 1 (p.10)
Framework connecting SD pedagogical approaches to competencies
Lozano et al., 2017  Figure 1 (p.10)
Break with Carolyn’s 8 ways......
Activity 4 – Gap Analysis (Paired Discussion)

Step 1
- Discuss which type of activities that you mapped from figure 1 that you already do.

Step 2
- Identify the competencies that need the most attention
### Framework connecting SD pedagogical approaches to competencies

Lozano et al., 2017  Figure 1 (p.10)

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<tr>
<th>Competence</th>
<th>Case Studies</th>
<th>Interdisciplinary team teaching</th>
<th>Lecture</th>
<th>Mood and concept maps</th>
<th>Project and/or Problem-based learning</th>
<th>Community Service Learning</th>
<th>Debate/Interlinked Teams</th>
<th>Participatory Action Research</th>
<th>Eco-Justice and community</th>
<th>Place-Based Environmental Education</th>
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Activity 5 – Design

**Step 1** - (Think/Reflect)
- Design how you could incorporate one of these pedagogical components into your course.

**Step 2** - (Share)
- Share your plan
Sustainability Competencies
(Frisk and Larsen 2011)

1. Systems thinking and an understanding of interconnectedness:

- The ability to understand complexity and see holistically
- Identifying and prioritizing challenges across the three sustainability domains
- An understanding of the dynamics of complex socio-ecological systems, with tipping points, feedback loops and emergent properties
- Recognition of the diverse viewpoints of multiple stakeholders
**Systems thinking competencies can be gained through:**

- **Place-based learning** allows students to explore their own communities with diverse stakeholders and trade-offs.
- **Problem based learning** using real-world complex issues, avoiding over-simplification, using an interdisciplinary approach.
- Concept mapping
- Computer modeling

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**World Hypoxic and Eutrophic Coastal Areas**

[Map of World Hypoxic and Eutrophic Coastal Areas]

**Diagram of the Food System Cycle:**

- Natural Resources
- Production
- Recycling and Composting
- Food System
- Processing
- Distribution
- Access
- Society and Culture
- Use
- Technological Systems

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2. **Long term, foresighted thinking:**

- **Visionary exercises** – where we are now (current state), where we are going (based on trends), where do we want to be (vision statement), and how we plan to get there (action plan)

- **Backcasting and forecasting**

Together these techniques stress the importance of individual and collective change for a sustainable future
3. Stakeholder engagement and group collaboration

- Because sustainability problems are complex, there is no single ‘right’ solution. Need to address multiple stakeholders viewpoints, and interdisciplinary nature requires inclusiveness and cooperation.

  **Skills needed:**
  - Effective communication, negotiation and collaboration skills
  - Fostering respect and tolerance for multiple ways of knowing
  - Problem solving

  **These can be obtained through:**
  - Community orientated team projects
  - Role playing using real world situations and group work
  - Community service learning that involves group collaborations
Collaborative team work fosters many of the sustainability competencies:

- Communication skills
- Leadership skills
- Organization and planning
- Conflict resolution, negotiation
- Empathy, openness to diversity, tolerance for differences
4. Becoming a Change Agent

- Requires ‘action’ learning which is a form of **experiential learning**. Experiential activities lead to transformative learning (Sipos et al. 2007).

- Students retain an estimated 80% of knowledge, skills and values from active participation, in contrast to only 10 to 20% of what they hear or read (Cortese 2003).

- Builds students confidence that their behaviours do in fact bring about change.

**Gained through:**

- Project-based learning
- Community-based service learning
- Place-based projects

*What is the legacy our students will leave?*
1. Which type of activities/learning styles do you already do that addresses some of these competencies?

2. If you could, which competency would you be able to easily incorporate into your classes?
References

- AASHE. 2010. Sustainability curriculum in higher education: a call to action. The Association for the Advancement of Sustainability in Higher Education, Denver, CO.


Behavourial change research and education

- Declarative knowledge – factual knowledge
- Procedural knowledge – ‘how to’
- Effectiveness or ‘impact’ knowledge – addresses outcomes
- Social knowledge – norms and customs

Sustainability Education should include as many as these knowledge domains as possible to motivate sustainable action (Frisk and Larson, 2011)