Creating spaces for cross-cutting concerns within higher education curricula: a framework for intervention.

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Creating spaces to embed cross-cutting themes & competencies in curricula

Interlinked societal challenges requiring a broad range of inter- and trans-disciplinary competencies (sustainability, RRI frameworks)

Barriers to more deeply integrating sustainability competencies across HE curricula (Weiss et al, 2021).

Design(&pilot) implementation framework for organizational intervention (based on existing RRI/sustainability competency frameworks).
Example: Unsustainable Patterns of Technological Change

Direct use of the technology

Interconnected impacts
Climate change, pollution, biodiversity loss
Physical and mental health, war, food/energy security.

Individual & societal capacities

Practices enabled by the technology

Figure 10: For the India Demand scenario, this illustrates the approximate split into different sectors. It is estimated that 42% of total demand will come from data centres and large energy users by 2050.
Cross-cutting themes

(UNESCO, 2022)

“Important curriculum content [...] to be covered across subjects [...] rather than being taught and learned in one particular subject. These themes can connect programme content across disciplinary boundaries; enrich the curriculum without overloading it through the introduction of additional teaching subjects; and facilitate interdisciplinary thinking and collaborative learning. Examples include human rights, gender issues, peace education, and education for sustainable development.”
Cross-cutting competencies

Sustainability competencies: “interplay of knowledge, capacities, skills, motives and affective dispositions” (Rieckmann 2012:129).

“current and future citizens and professionals[..]need to be equipped with the capabilities to tackle grand challenges, to participate in [...]collaborative processes, and to contribute to the development of responsible societies.” (Tassone et al, 2018)

Responsible research and innovation competencies: ” interplay of knowledge, skills and attitudes (including values)[..] articulated across four dimensions [...]anticipation, reflexivity, inclusiveness and responsiveness. (Tassone and Eppink, 2016:15).
Spaces

- time
- formal/informal
- physical/online
- in curricula, within research projects

For staff, students, communities
Challenges

**Curricular** : Embedding cross-cutting concerns within a (mostly disciplinary) curriculum-relating competencies and themes.

**Organisational** : Deeper integration of inter- and trans-disciplinary learning.

**Institutional** : Rethinking and reconfiguring higher education.
• Use/adapt existing competency frameworks

Frameworks - interlinked competencies:
• Sustainability
• Responsible research and innovation

Framework of interlinked competencies (relevant to needs).

• Build an implementation framework

Address barriers, facilitate collaboration, build and nourish networks to drive persistence.
ANTICIPATION
- Future-studies capabilities
- Future-oriented ethical capabilities
- Pro-activity

RESPONSIVENESS
- Navigating complexity, wickedness, uncertainties, ambiguities
- Adaptability
- Agency

REFLEXIVITY
- Reflecting about contexts, ways of knowing, ways of doing, and ways of being
- Self, situational, social awareness & empathy
- Ethical thinking
- Disruptive thinking

INCLUSIVENESS
- Multi-perspective, inter-cultural
- Participatory ability
- Trans-disciplinary collaboration
- Openness and transparency

Adapted from Tassone et al, 2018
(Interlinked) Skills and Competencies
(RRI, sustainability, creativity, learning, general)

“interplay of knowledge, capacities, skills, motives and affective dispositions” (Rieckmann 2012:129).

See: Brundiers et al, 2021; Bianchi et al, 2022; Redman and Wiek, 2022; Tassone et al, 2021; Rieckman et al, 2017
Adapted framework of **interlinked** competencies

**Implementation framework/strategy**

- Leverage existing resources to build activities (e.g. sustainability science - Clark and Harley, 2020; ESD - Vare et al, 2019; RRI toolkit etc.).
- Address barriers, build and nourish networks to drive persistence.
<table>
<thead>
<tr>
<th>Drivers</th>
<th>Barriers</th>
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<tbody>
<tr>
<td>Vision and strategy, external incentives</td>
<td><strong>External</strong> pressures/expectations</td>
</tr>
<tr>
<td>Coordination, communication, collaboration</td>
<td><strong>Structural</strong> – separate disciplines, management, academic planning, path dependencies</td>
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<tr>
<td>Internal and external networks.</td>
<td><strong>Lack of vision, strategy, resources, support, time, space, skills, knowledge...</strong></td>
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<tr>
<td>Creation of inter-disciplinary spaces</td>
<td><strong>Cultural</strong>- lack of opportunities for inter-disciplinary collaborations, particularly across faculties, separate physical spaces.</td>
</tr>
<tr>
<td>Time and resources</td>
<td><em>(Weiss et al, 2021).</em></td>
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</tbody>
</table>
**Implementation**

**Collaboration**

1. Share/collaborate with other disciplines.
2. Provide activities(s) linking to relevant themes.
3. Contribute workshop(s)/activities as a micro-module or building block for competency development.
4. Map workshops to competency framework
5. Reflect and share learning

**Coordination**

- Networking opportunities for potential collaborators.
- Framework to map micromodules/workshop(s) to relevant themes and competencies, possibly building stackable microcredentials.

**External providers**

1. Provide workshop(s)/activities as micro-modules or building blocks for competency development.
2. Map to framework
Seeking collaborators

Develop and map to competency framework

Closed/ In progress.

(Advertised & Open for participants)

Developed workshop-map to framework

Reflect and learn

New Idea for Activity

Developing Activities: draft workflow
<table>
<thead>
<tr>
<th>Examples of Workshops/Activities</th>
<th>Competencies (+ learning objectives)</th>
<th>Theme &amp; Level</th>
</tr>
</thead>
</table>
| SDGs from Multiple Perspectives                                                                | Systems thinking  
Values thinking  
Interpersonal, Intrapersonal                                                                      | Sustainable development goals (introductory)               |
| Anticipatory thinking: Ethical OS with a multidisciplinary group                                | Values thinking  
Interpersonal, Intrapersonal                                                                      | AI and Ethics (introductory)                                |
| How do we know?                                                                                | Critical thinking  
Values thinking  
Integrated problem solving  
Interpersonal, Intrapersonal                                                                    | Fake news (introductory)                                    |
| Scenario Planning                                                                              | Futures/anticipatory thinking  
Systems thinking  
Strategic Thinking  
Integrated problem-solving                                                              | Regional Food security (advanced)                          |
| Systems Mapping                                                                                | Systems thinking  
Futures thinking  
Implementation  
Interpersonal, Intrapersonal                                                                  | Sustainable Energy Transition: Deep retrofitting strategy (advanced) |
Proposal: Pilot study

Create (build or re-purpose) and provide:
1. a series of (inter-linked) inter-disciplinary workshops/activities (for staff/students/researchers) aimed at developing one or more (RRI/sustainability) competencies.
2. Provide a mapping from each workshop to a competencies framework demonstrating how particular competencies can be developed, (possibly) building microcredentials.

Evaluate:
2. Contribution of framework to building organizational capacity for the development of competencies in RRI/sustainability. Identify gaps/needs.

Reflect, Synthesize and Refine:
Identify what else is needed and augment/refine.
Any Questions?