

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

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Building Capacity in Higher Education

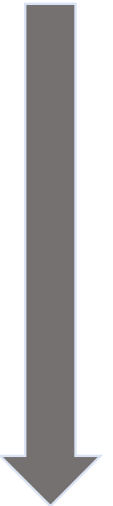
Creating **spaces** to embed **cross-cutting** themes & competencies in curricula

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

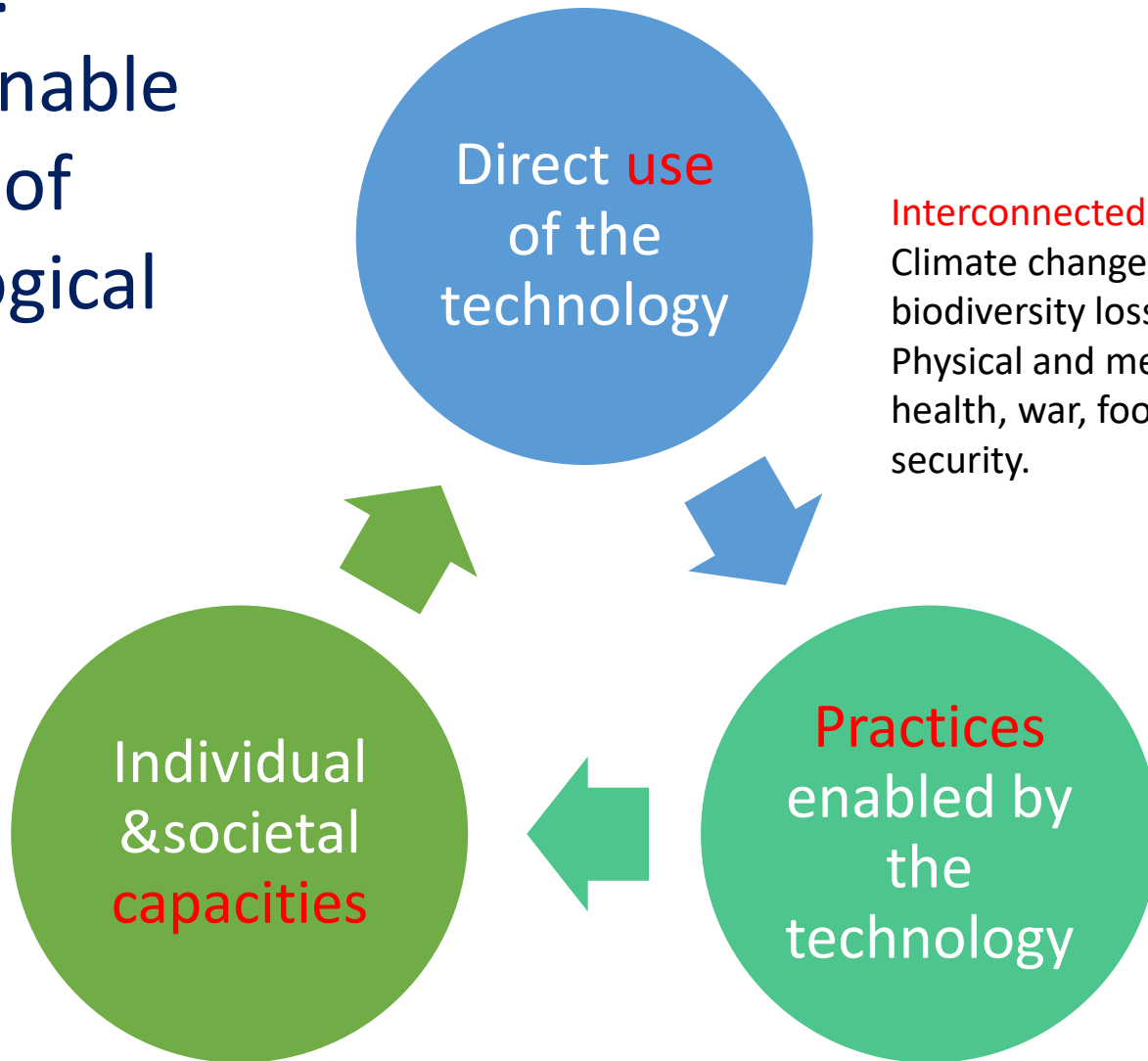
Barriers to more deeply integrating sustainability competencies across HE curricula(Weiss et al, 2021).



Design(&pilot) implementation framework for organizational intervention (based on existing RRI/sustainability competency frameworks).



Example:
Unsustainable
Patterns of
Technological
Change



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

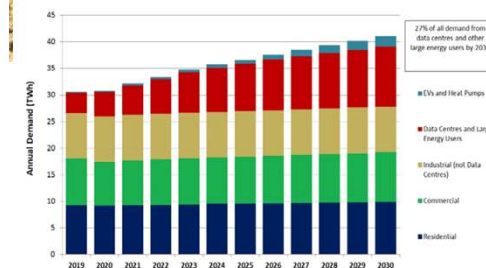


Figure 10 - For the Ireland Median Demand scenario, this illustrates the approximate split into different sectors. EirGrid estimate that 27% of total demand will come from data centres and large energy users by 2030

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

For staff,
students,
communities

formal/informal

physical/online

in curricula, within
research projects

Challenges

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

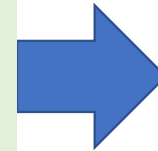
Organisational : deeper integration of inter- and trans- disciplinary learning.

Institutional : rethinking and reconfiguring higher education.

- Use/adapt existing competency frameworks

Frameworks - interlinked competencies:

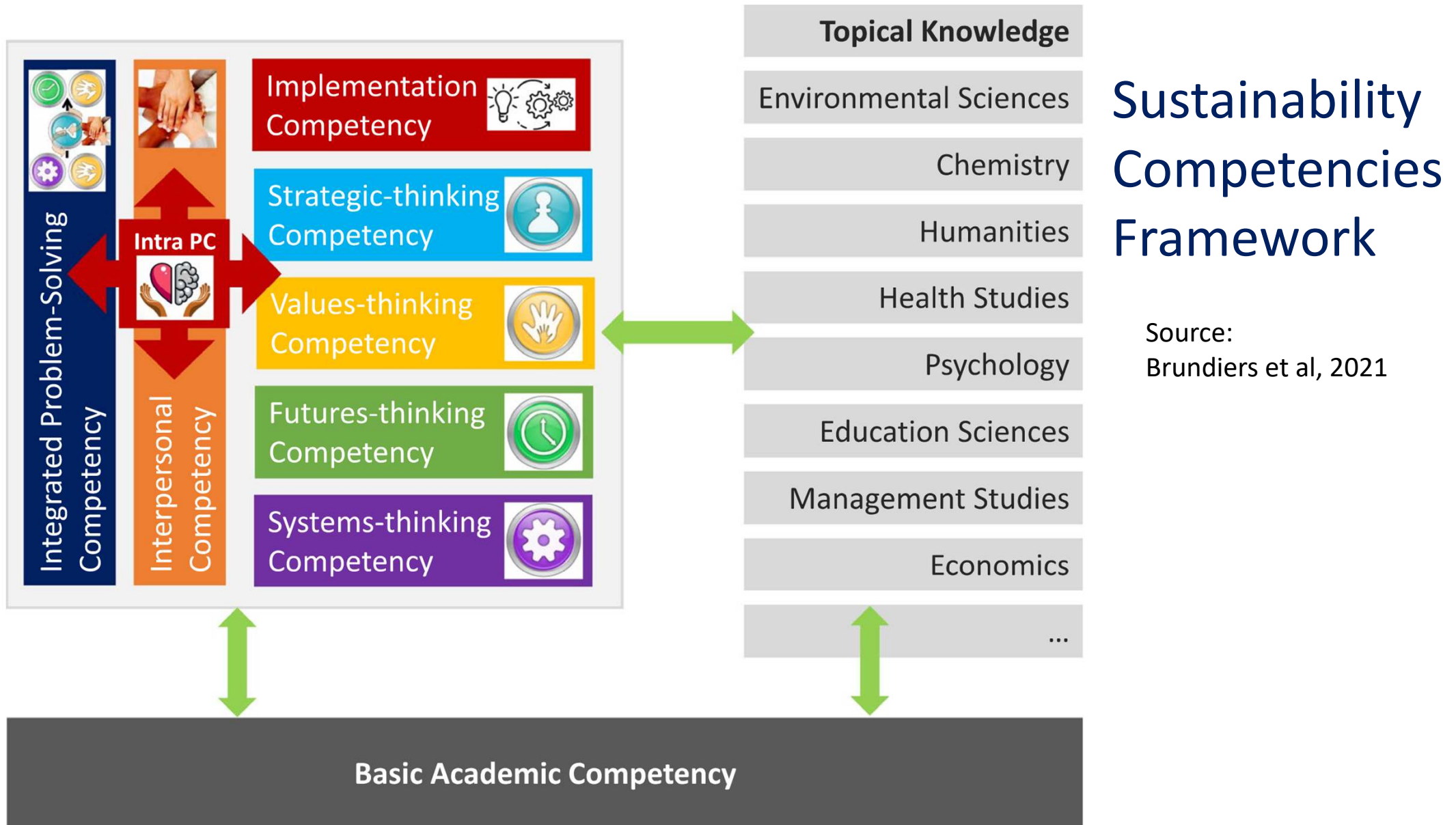
- Sustainability
- Responsible research and innovation



Framework of
interlinked
competencies
(relevant to needs).

- Build an implementation framework

Address barriers, facilitate collaboration, build and nourish networks to drive persistence.



RESPONSIVENESS

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



Responsible Research and Innovation Competencies

Adapted from Tassone et al, 2018

REFLEXIVITY

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



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ANTICIPATION

- Future-studies capabilities
- Future-oriented ethical capabilities
- Pro-activity



INCLUSIVENESS

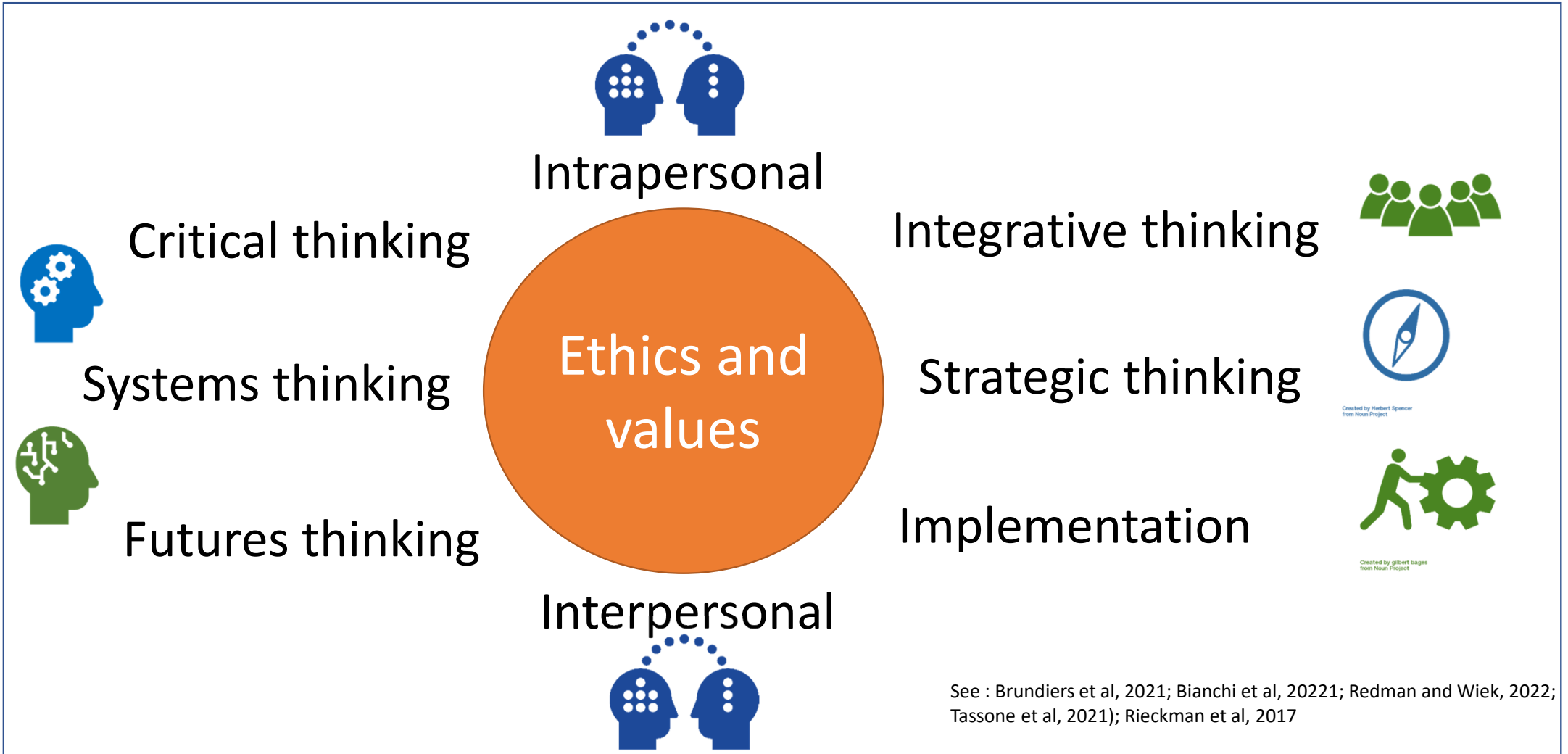
- Multi-perspective, inter-cultural
- Participatory ability
- Trans-disciplinary collaboration
- Openness and transparency



(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..

Barriers

External pressures/expectations

Structural – separate disciplines, management, academic planning, path dependencies

Lack of vision, strategy, resources, support, time, space, skills, knowledge...

Cultural- lack of opportunities for inter-disciplinary collaborations, particularly across faculties, separate physical spaces.

Drivers

Vision and strategy, external incentives

Coordination, communication, collaboration

Internal and external networks.

Creation of inter-disciplinary spaces

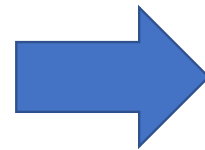
Time and resources (Weiss et al, 2021).

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

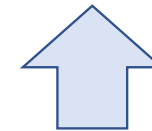


Coordination



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*



New
Idea for Activity



Developed
workshop-
map to
framework

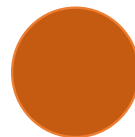
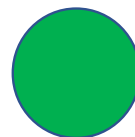
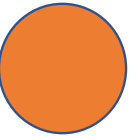


Developing
Activities :
draft
workflow



| Examples of Workshops/ Activities | Competencies (+ learning objectives) | Theme & Level |
|--|---|--|
| 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) |

STATUS



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:

1. Contribution of workshops in building competencies.
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?