



 NTNU | SEED



# Integrating sustainability into MNT education

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Har du meldt deg på  
SEEDs nyhetsbrev?

[ntnu.no/seed](https://ntnu.no/seed)





## **ESD workshop series 2024:**

1. Introduction to Education for Sustainable Development (8-9/2, online)
2. There's no perfect solution to real-world problems:  
Teaching sustainability with wicked problems (29/2)
3. Engineers are human beings too: Dealing with values, emotions,  
and morality (1/3)
4. I'm not an expert in sustainability! (18-19/3, online)
5. How to integrate sustainability into already crammed courses (29/5)
6. Meeting students' expectations and leveraging their engagement (30/5)



# **Meeting students' expectations and leveraging their engagement**

Johanna Lönngren  
2024-05-30

# Workshop outline

- Who are your students?
- Progression mapping in 4 steps
- (Time for remaining questions)

## Intended learning outcome:

- Formulate intended learning outcomes, develop teaching and learning activities, and apply principles of progression in education for sustainability.



A young tree sapling with vibrant red leaves and a green catkin, set against a clear blue sky. The sapling is positioned on the left side of the frame, with its stem extending vertically. The leaves are a deep, rich red color, and the catkin is a bright green. The background is a clear, bright blue sky with some faint, out-of-focus greenery at the bottom.

# Who are your students?

Drawing on the persona descriptions you developed of a “typical” students, discuss

1. the range of attitudes and prior knowledge you can expect your students to have in relation to sustainability.
2. how you could leverage your students’ interest and engagement for sustainability by connecting to their backgrounds, interests, personalities, and expected first employment.

# Mapping elements of ESD in your teaching/pedagogical work

**In groups (5 min):** Briefly discuss your experiences of working with this chart. What did you learn? Which parts were easiest/hardest for you to fill in?

Part of the unit	Content			ESD competencies							Pedagogical approaches				
List all parts that constitute the unit you have chosen	Ecological SD	Social SD	Economic SD	Systems thinking	Anticipatory	Normative	Strategic	Inter-personal	Intra-personal	Implementation	Integrated problem-solving	<b>Student-centered</b> <ul style="list-style-type: none"> <li>- Active learning</li> <li>- Democratic: Students participate in shaping their education</li> </ul>	<b>Action-oriented</b> <ul style="list-style-type: none"> <li>- Engaging with authentic &amp; meaningful challenges</li> <li>- Related to students' lived experience</li> <li>- Opportunity to experience change agency</li> </ul>	<b>Transformative</b> <ul style="list-style-type: none"> <li>- Challenging/changing worldviews that hinder working for sustainability</li> <li>- Disruptive thinking</li> <li>- Co-creating new knowledge</li> </ul>	<b>Inter-/transdisciplinary</b> <ul style="list-style-type: none"> <li>- Addressing sustainability issues from diverse perspectives</li> <li>- Collaboration across boundaries</li> </ul>

# Mapping progression in ESD – 4 steps\*

## 1. Difficulty of ESD content

- Basic/concrete, intermediate, advanced/abstract
- Based on your own judgment and knowledge of what your students find difficult

## 2. Level of mastery of ESD key competencies

- Novice, intermediate, advanced
- Based on the framework provided in Wiek et al. (2015)

## 3. Levels of difficulty of ESD pedagogy

- 3-4 levels each for ways of learning, ways of teaching, disciplinarity
- Based on the tables on p.3

## 4. Overall picture

\*No, you won't finish any of these steps today, but we'll start exploring all of them.

# 1. Mapping difficulty of ESD content

	<b>Specific content</b> (e.g., a concept, theory, framework)	<b>Difficulty level</b> 1: basic/concrete 2: intermediate 3: advanced/abstract
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## **Individually (5 min):**

1. Add a piece of sustainability-content you teach to a row in the left column – in the section that best describes the focus of the content (ecological, social, economical, or integrated sustainability).
2. Judge the level of difficulty for that piece of content.
3. Repeat steps 1 and 2 until time is up.

**In groups:** Share & compare.

<b>Ecological SD</b>		
<b>Social SD</b>		



## 2. Mapping levels of mastery of ESD competencies

	<b>Learning activity</b> (e.g., stakeholder analysis, personal reflection, lecture, ...)	<b>Level of mastery</b> 1: novice 2: intermediate 3: advanced	<b>Learning objectives</b> (c.f., tables 16.1-16.5 in Wiek et al., 2015)
<b>Systems thinking</b>	<p><b>Individually (5 min):</b></p> <ol style="list-style-type: none"> <li>1. Add a learning activity you use in your teaching to a row in the left column – in the section for the most relevant competency/ies.</li> <li>2. Judge the level of mastery for the competency/ies that your students are expected to develop during that learning activity.</li> <li>3. Formulate a learning objective that matches the level of mastery for the competency/ies and the learning activity.</li> <li>4. Repeat steps 1 – 3 until time is up.</li> </ol> <p><b>In groups:</b> Share &amp; compare.</p>		
<b>Anticipatory competency</b>			

### 3. Mapping levels of difficulty of ESD pedagogy

Specific activity (e.g., a lecture, group discussion, role play, ...)	Ways of learning	Ways of teaching	Disciplinarity
	1: Factual recall 2: understanding & interpretation 3: analytic & experiential 4: emotional & reflexive	1: Transmissive 2: Facilitation 3: Co-production	1: Single discipline 2: Multidisciplinary 3: interdisciplinary Transdisciplinary

#### **Individually (10 min):**

1. Read p.3 on Levels of difficulty for ESD pedagogy
2. Add a learning activity you use in your teaching to a row in the left column.
3. Judge the level of difficulty of the pedagogical approach you use for that learning activity in terms of each of the three dimensions: (a) ways of learning, (b) ways of teaching, and (c) disciplinarity.
4. Repeat steps 1 – 2 until time is up.

**In groups:** Share & compare.

## 4. Overall picture

### **Discuss in groups:**

1. Can you see any patterns in the levels of difficulty/mastery you have identified in your teaching? Are some levels over- or under-represented? What could explain the (lack of) patterns you see?
2. Explore the temporal sequences in your teaching – do the levels of difficulty/mastery increase over time, i.e., can you identify ESD progression?
3. Discuss if/how you could improve ESD progression in your teaching to better match students' expectations, knowledge, competencies... – within each of the three domains (content, competencies, pedagogy) and/or in terms of how the domains are combined.



# Open questions?

Possibility to discuss more specific questions tomorrow, 31 May, @SEED. Drop-in 10-12, but please tell Elizabeth if you plan to come.

# POTENTIAL SOURCES OF FUNDING FOR EDUCATIONAL DEVELOPMENT PROJECTS

- International level:
  - Erasmus+: <https://erasmuspluss.no/utlysninger-og-tilskudd?disciplines=Høyere%20utdanning%20og%20forskning>
  - Nordplus: <https://www.nordplusonline.org/programmes/higher-education/>
- National level:
  - HK-dir – Direktoratet for høyere utdanning og kompetanse: <https://hkdir.no/utlysninger-og-tilskudd?disciplines=%255B%2522H%25C3%25B8yere%2520utdanning%2520og%2520oforskning%2522%255D>
- NTNU level:
  - NTNU Teaching Excellence (Toppundervisning): <https://www.ntnu.edu/teaching-excellence/development-projects-sfu>
- Faculty level:
  - Development projects at the NV faculty: <https://www.ntnu.no/nv/utdanningsprosjekter>
  - Are there other faculties doing similar things...?

# REFERENCES

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- Hinde, E. T. (2005) Revisiting Curriculum Integration: A Fresh Look at an Old Idea, *The Social Studies*, 96:3, 105-111, <https://doi.org/10.3200/TSSS.96.3.105-111>
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