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Design Toolkit
Climate & Sustainability Education at BUas

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Educating for Sustainability Transitions: Theoretical Foundations

What is Education for Sustainable Development?

Education for Sustainable Development (ESD), as defined by UNESCO, has the ambition to activate learners to engage with societal issues by exploring shifting perspectives on ourselves and our complex world (Leicht et al., 2018). Rather than simply teaching *about* environmental problems, ESD aims to empower students to become agents of change: professionals who can contribute to the societal transitions needed to address climate change and broader sustainability challenges. At its heart, ESD recognizes that sustainability challenges are not purely technical problems to be solved with better technology or more efficient systems. They are fundamentally about how we organize society, what we value, and how we relate to each other and the world around us. This means education must do more than transmit knowledge: it must support students in questioning current ways of doing things, developing their own perspectives, and building capacity to navigate uncertainty and complexity.

UNESCO's vision positions education as a catalyst for societal transformation. This is ambitious. It asks education to shift from preparing students for existing professional roles to helping them become change-makers who can shape new futures. Yet, it would be "naïve to think that the sort of changes needed in our societies will ever occur without deep shifts in our prevailing system of education" (Luksha et al., 2018, p. 2).

Three levels of ESD

Stephen Sterling, a leading scholar in sustainability education, helps clarify what ESD can mean in practice by distinguishing three levels (Sterling, 2014):

1. **Education *about* sustainable development**: Teaching students about environmental issues, climate science, and sustainability concepts. This adds sustainability as a topic but doesn't fundamentally change how education works.
2. **Education *for* sustainable development**: Preparing students with skills and knowledge to contribute to sustainability in their professional lives. This is useful but still positions students as adapting to existing systems rather than transforming them.
3. **Education *as* sustainable development**: Using education itself as a process of transformation. Here, learning contributes to re-evaluating the norms that guide current systems, through experiences that enable students to develop agency, question assumptions, and imagine alternatives.

This third level (education *as* sustainable development) represents UNESCO's deeper ambition and aligns with what's needed for genuine societal transitions. It's also the most challenging to implement because it requires rethinking fundamental aspects of how we organize education.

Pedagogical approaches in Education for Sustainable Development

Several pedagogical approaches have emerged that align with ESD's (level 3) transformative ambitions. To name a few:

Transformative learning focuses on experiences that fundamentally shift how we see ourselves and our world: not just what we know, but how we know and who we are becoming (Lotz-Sisitka et al., 2015; Mezirow, 2005). This kind of learning often involves dealing with discomfort in revealing and questioning assumptions that have been taken for granted.

Regenerative education goes beyond "sustainability" (maintaining current systems) to actively restoring and regenerating social and ecological systems (van den Berg et al., 2022). This requires engaging with complexity, uncertainty, and emergence rather than following predetermined solutions.

Challenge-based and project-based learning engages learners with authentic, complex challenges where there are no clear "right answers". Learners must navigate ambiguity, collaborate across differences, and develop their own well-reasoned approaches.

What these approaches share is an emphasis on:

- **Process over product**: How learners engage matters as much as what they produce
- **Emergence**: Creating space for unexpected insights and directions
- **Agency**: Students actively shape their learning and professional practice, rather than passively receiving knowledge.
- **Dialogue**: Learning through genuine exploration with others, not just instruction
- **Whole-person development**: Engaging emotions, values, and identity (not just cognition).

These pedagogies recognize that we cannot predict the specific knowledge and skills students will need for futures we cannot foresee. Instead, we must help students develop capacities for navigating uncertainty, questioning norms, working collaboratively, developing a moral compass, and taking action in complex contexts.

Implications for assessment

Various educators across different levels of education and different places in the world have been working hard at exploring the potential of these pedagogies. But here's where things get challenging: if ESD requires transformative learning, agency, and emergence, how do we assess it?

Traditional assessment approaches create significant tensions (Cebrián et al., 2020; Redman et al., 2021; Wiek & Redman, 2022):

- **Predetermined outcomes**: Learning outcomes define what students should be able to demonstrate at the end of a course. But transformative learning often involves unexpected developments (insights and growth that couldn't be predicted in advance). How can we predetermine outcomes for learning that's supposed to be emergent?
- **Individual achievement focus**: Most assessment measures individual student performance. But sustainability transitions require collective action and collaborative capacities. How can we assess students' contributions to collective learning?
- **Product over process**: Assessment typically evaluates final products (papers, presentations, projects). But in ESD, how students engage with complexity and uncertainty may matter more than their final outputs. How can we assess the quality of someone's learning journey?
- **The illusion of neutrality**: Assessment presents itself as objective measurement against neutral standards. But as we've seen, ESD is inherently value-laden: it asks students to question current norms and imagine alternatives (Clark, 1989). How can assessment acknowledge this while maintaining rigor?

These tensions are not trivial. They stem from fundamental misalignments between ESD's ambitions and the structures through which education typically operates. Many educators implementing innovative ESD pedagogies find themselves stuck with traditional assessment approaches that don't fit.

The challenge isn't just finding better assessment formats. It's revisiting how we use assessment so that it can serve transformative learning rather than constrain it. Luckily we can build on existing conceptions how to use assessment, such as the distinction of **assessment *of, for,* and *as* learning** (Schellekens et al., 2021):

Table 1. Summary of assessment *of, for* and *as* learning. Based on Schellekens et al. (2021).

	Assessment of Learning (AoL)	**Assessment *for* Learning (AfL)**	**Assessment *as* Learning (AaL)**
Primary Purpose	Measurement and judgement of learning achievement; certification and accountability	Process of seeking and interpreting evidence to improve learning and teaching	Active engagement of students in self-assessment and development of metacognition
Focus	Measuring outcomes; determining status of achievement	Identifying learning needs; closing learning gaps; where students are and need to go	Student self-regulation; learning how to learn
Student Role	Passive recipient of judgement	Active recipient of feedback	Active agent and partner
Teacher Role	Judge	Diagnostician	Guide/Facilitator
Relationship	Hierarchical (teacher-centred)	Collaborative (moving toward student-centred)	Partnership (student-centred with teacher support)
Learning Environment	Assessment separate from learning	Assessment integrated with teaching	Assessment is the learning process itself
Key Question	What have students learned? Did they meet standards?	Where are students in their learning? How can I help them improve?	How am I learning? What do I need to do to improve my own learning?

In the next section three design principles (*Value-based, Dialogue-oriented,* and *Design Forward*) to develop learning activities and assessment that genuinely align with ESD's transformative ambitions are explained, and how they can be used to bridge the missing link between theory and practise.

In a nutshell

- **ESD is transformative**: It's not just about teaching sustainability content, but about creating learning experiences that help learners question norms, develop agency, and imagine alternatives.
- **Context matters**: We're living in the Anthropocene, confronting challenges so complex and interconnected that they require fundamentally new ways of thinking and organizing society.
- **Pedagogy has evolved**: Approaches like transformative learning and regenerative education show what ESD can look like in practice, but assessment hasn't kept up.
- **Assessment is the missing link**: Traditional summative assessment approaches create tensions with ESD's ambitions, leaving educators struggling to evaluate learning that's emergent, collective, and value-laden.
- **Assessment can play different roles in learning**: This can be summative or formative, and focus on capturing what has been learnt (*of* learning), identifying learning needs (*for* learning) or developing metacognition (*as* learning).
- **New design principles are needed**: Moving forward requires revisiting assessment's role within the learning journey, guided by design principles specific to ESD.

The Bridge: From Theory to Practice with Design Principles

Working within the system to transform it

The theoretical foundations reveal a profound challenge: ESD requires transformative approaches that don't fit neatly within traditional educational structures. At the same time we cannot simply abandon those structures. Educators work within institutions that have learning outcomes, assessment requirements, accreditation standards, and quality assurance processes. Students expect clarity about what they're learning and how they'll be evaluated. The question becomes: *how do we create space for transformative learning while operating within these existing systems?*

This is not about conforming ESD ideals to fit current structures. Rather, it's about using the tools of the current educational system strategically to create stepping stones toward transformation. We work *with* institutional requirements like learning outcomes and summative assessment, not by diluting ESD ambitions but by reinterpreting what these tools can mean and do.

Context: BUas Climate & Sustainability Education

At BUas, sustainability education is guided by two Intended Learning Outcomes (ILOs) that all students engage with across all Bachelor curricula:

ILO 1: Account for climate and sustainability realities/facts in crafting context-specific courses of action to tackle societal challenges that relate to climate change and/or the broader challenge of sustainable development		
Basic Level	**Intermediate Level**	**End Level**
With guidance, <u>identify</u> climate and sustainability <u>issues</u> that are relevant to a domain's current and potential contribution to tackling societal challenges that relate to climate change and/or the broader challenge of sustainable development	With coaching, <u>analyse</u> the <u>interdependencies</u> between various climate and sustainability <u>issues</u> that are relevant to a domain's current and potential contribution to tackling societal challenges that relate to climate change and/or the broader challenge of sustainable development	With limited coaching and direction, <u>make well-argued choices and decisions</u> in <u>crafting context-specific courses of action</u> (within or across domains) to tackle societal challenges that relate to climate change and/or the broader challenge of sustainable development

ILO 2: Develop their/your own (current and future, personal and professional) role in tackling societal challenges that relate to climate change and/or sustainable development		
Basic Level	**Intermediate Level**	**End Level**
With guidance, <u>identify</u> a range of <u>realities, facts, perspectives</u> and <u>opinions</u> with respect to societal challenges that relate to climate change and/or the broader challenge of sustainable development	With coaching, <u>analyse positionality of stakeholders</u> involved with societal challenges that relate to climate change and/or the broader challenge of sustainable development	With limited coaching and direction, <u>make well-argued choices and decisions</u> in <u>crafting their/your own (current and future, personal and professional) role</u> in tackling societal challenges that relate to climate change and/or the broader challenge of sustainable development

These ILOs create space for transformative learning by focusing on engaging with context-specific complexity (ILO1) and developing one's own role (ILO2). But their potential is only realized through how we design learning environments and assessment practices around them. This is where the design principles come in.

Design principles as a bridge

Three design principles serve as bridges between ESD theory and educational practice. They translate theoretical insights about what sustainability education requires into practical guidance for designing courses, activities, and assessment.

1. **Value-Based: Learning environments and activities expose the dominant (socio-economic) narratives underlining them.**

This principle addresses the tension between ESD's value-laden nature and education's pretence of objectivity. This principle guides educators to make values explicit, surface assumptions, and support students in building their own perspectives.

2. **Dialogue-Oriented: Learning environments and activities stimulate meaningful dialogue about who we are, how we relate to each other and the world, and what narratives guide us.**

This principle addresses the tension between transformative learning's emphasis on emergence and education's reliance on instruction. Rather than transmitting predetermined knowledge, this principle guides educators to create conditions for collective exploration and meaning-making.

3. **Design Forward: Members of the learning environment emphasise the kinds of relationships and activities that facilitate emergence.**

This principle addresses the tension between ESD's need for flexibility and education's focus on predetermined outcomes. Rather than starting with what students must demonstrate, this principle guides educators to design learning environments that support intended processes and allow for emergence.

How the principles work together

While each principle addresses a specific tension, they are deeply interconnected. You cannot fully implement one without the others:

- **Value-based design requires dialogue**: You cannot expose and question narratives through instruction alone. Creating space for students to develop their own perspectives requires dialogue where multiple viewpoints can be explored.
- **Dialogue enables forward design**: When learning emerges through genuine exploration, you cannot fully predetermine outcomes. Meaningful dialogue requires openness to where conversation leads.
- **Forward design creates space for value-based design**: When you're not constrained by predetermined outcomes, you can create space for students to question dominant narratives and build alternatives, rather than demonstrating mastery of existing frameworks.

Together, the principles represent a shift in:

- Transmitting established knowledge → Creating space for emergence
- Qualifying students for predetermined roles → Supporting development in unknown future directions
- Measuring achievement against fixed standards → Valuing and facilitating learning journeys

In a nutshell

Three interconnected design principles guide developing learning activities and assessment that match ESD ambitions, while acknowledging institutional constraints, so that we create space for transformative learning:

1. **Value-based**: Learning environments and activities expose the dominant (socio-economic) narratives underlining them.
2. **Dialogue-oriented**: Learning environments and activities stimulate meaningful dialogue about who we are, how we relate to each other and the world, and what narratives guide us.
3. **Design Forward**: Members of the learning environment emphasise the kinds of (learning) environment and relationships that facilitate emergence.

Walking the Bridge: Working with Design Principles

Two-Lane approach to assessment

It is neither practical nor desirable to overhaul every learning activity and assessment moment to align with ESD immediately. Rather, placing a mirror against your educational (assessment) activities to identify the alignment with pedagogical principles behind education that asks learners to engage with societal challenges can open up opportunities to explore alternatives.

In higher education educators and institutes are required to verify in a valid and reliable manner whether students have achieved the Learning Outcomes for their courses and programme. The **Two-Lane Approach to Assessment**, developed by Liu & Bridgeman (2023) to preserve academic integrity with AI, builds on the concept of assessment *of*, *for* and *as* learning by broadly categorising two lanes of assessment for different purposes and requirements. In the context of ESD, the two lanes can be applied as shown in table 2.

Table 2. Summary of the two-lane approach. Adapted from Bridgeman, Weeks & Liu (2024)

	Lane 1 (Assessment *of* Learning)	Lane 2 (Assessment *for/as* Learning)
Role of assessment	Assessment *of* learning – verify students can demonstrate ILOs	Assessment *for* and *as* (transformative) learning – develop capacity to engage with sustainability transitions
Level of operation	Mainly at programme level – strategic verification points of ILO levels	Mainly at unit/course level – embedded in ongoing learning activities
What is verified/ developed	**ILO 1**: Can students identify issues, analyse interdependencies, and craft context-specific courses of action? **ILO 2**: Can students identify perspectives, analyse positionality, and articulate their own role in sustainability challenges?	**ILO 1**: How do students develop their capacity to navigate complexity and craft responses to sustainability challenges? **ILO 2**: How do students explore and develop their evolving role as sustainability actors?
Examples	Interactive oral assessments, live case analysis, facilitated dialogues or debates, observed practice in authentic contexts, in-class contemporaneous responses	Narrative evidence portfolios, iterative design processes, dialogue (journals), process documentation, stakeholder engagement projects

The two-lane approach and three roles for assessment provide the backbone to guidance on practical application for the design principles. The remainder of this toolkit helps you explore how the three design principles can be used to practically implement both lanes in ways that honour ESD's transformative aims, while meeting institutional requirements.

Working on your own educational practice

The design principles are tools to guide your design thinking and decision-making. Think of them as a compass rather than a map: they provide orientation for your journey without prescribing the exact route. The Two-Lane approach is alongside this a tool to frame your ambition in pedagogical design, and frame assessment accordingly.

For each principle, this toolkit provides:

- **Why it matters**: Why this principle is relevant for ESD, to help you understand not just *what* to do but *why* it matters.
- **Application guidance**: How to apply the principle when designing learning environments, activities, and assessment.
- **Illustrated examples**: Concrete examples from a case study course showing the principle in action for both Lane 1 and Lane 2 assessment. These demonstrate what the principle can look like in practice without prescribing one right way.
- **Reflection prompts**: Questions to help you adapt the principle to your specific context. Every course and context is different; these prompts support your thinking about what makes sense for your situation.
- **Common challenges**: Anticipated tensions and obstacles educators face when implementing the principle, with strategies for navigating them.

A note on feasibility

You might engage with the principles in different ways depending on your starting point:

- **If you're designing a new course**: Use all three principles from the beginning to shape your overall approach. Start with Design Forward to frame the learning environment, then use Dialogue-oriented and Value-based to guide specific design decisions.
- **If you're redesigning an existing course**: Choose one principle to focus on first, perhaps the one that addresses your biggest frustration with current practice. Implement it, learn from experience, then expand to other principles.
- **If you're working within tight constraints**: Use the principles to reinterpret existing requirements. For instance, Design Forward can help you think about learning

outcomes differently even when you must have them, and Value-based can guide how you frame assessment criteria.

- **If you're advocating for institutional change**: Use the principles to articulate what sustainability education needs (to be) and why. They provide language and rationale for why traditional approaches fall short.

The design principles represent significant shifts from traditional educational practice. You might feel they ask too much given your institutional constraints, workload, or students' expectations. These concerns are valid. But consider: continuing with approaches that fundamentally misalign with ESD's ambitions is also not feasible. It leads to student confusion, educator frustration, and education that cannot fulfil its potential as catalyst for sustainability transitions. The principles offer direction for evolution, and small shifts can create meaningful change. One redesigned activity, one reframed assessment criterion, one moment of making values explicit: these are feasible starting points that can grow into larger transformations over time.

You're not alone in this work. At BUas the following are able to support you in your implementation: The Transversal Professorship on Sustainability Transitions, BUas Climate & Sustainability Education Resources, and the broader sustainability education community (including BUas Community for Teaching and Learning) provide spaces for sharing, learning, and mutual support.

The following sections explore each principle in depth, providing the theoretical grounding, practical guidance, examples that have been validated with BUas students and lecturers, and reflection tools you need to begin applying them in your context.

In a nutshell

- **The two-lane approach**: Assessment can be designed as a learning environment rather than an endpoint measurement. Let assessment run alongside and support the learning journey, not waiting at its finish line.
- **Work within your context**: Start with your actual courses, students, and constraints. Co-design with those who will use the assessment. The bridge gets built by walking it, not by perfecting the blueprint first.
- **You're not in this alone**: Seek support from the BUas Transversal Professorship on Sustainability Transitions, Climate & Sustainability education resources, CTL and colleagues experimenting with similar designs.
- **What's actually hard**: The hardest part isn't creating new formats; it's shifting the underlying assumptions about what assessment is *for*. "Good enough" prototypes that maintain integrity beat perfect designs that lose transformative potential through compromise.

Design Principle 1: Value-Based

Learning environments and activities expose the dominant (socio-economic) narratives underlying them.

Why it matters

Education is never neutral. Every learning activity, every assessment task, every case study embeds assumptions about what matters, whose voices count, and what constitutes legitimate knowledge. In traditional education, these values often remain invisible, creating the illusion that learning is objective and politically neutral. This "hidden curriculum" (Cotton et al., 2013) perpetuates the very systems that have led to our current sustainability crises.

For ESD to fulfil its role as a catalyst for societal transition, education must move beyond teaching about sustainability to actively examining the narratives that shape our understanding of problems and solutions. As Sterling (2014) argues, education either moulds learners to fit traditional beliefs or critiques those beliefs to create new ones; there is no middle ground. Making values explicit allows learners to recognize how dominant socio-economic narratives (such as limitless growth, technological solutionism, or human exceptionalism) shape business as usual and to develop alternative narratives that centre ecological wellbeing and social justice.

Application Guidance

When designing learning activities:

- **Make the frame visible**: Include explicit statements about the value stance underlying your course, module, or activity. What assumptions about society, economy, or human-nature relationships does this learning build upon?
- **Surface narratives in cases and materials**: When using case studies, examples, or readings, actively name the narratives they represent. Whose perspective is centred? What is taken as given? What alternatives are made (in)visible?
- **Create space for counter-narratives**: Design activities where students identify and explore alternative narratives. This might include examining Indigenous knowledge systems, circular economy models, degrowth perspectives, or regenerative approaches alongside mainstream frameworks.

Questions to guide your thinking:

- What values and assumptions underlie the problems we're asking students to solve?

- Whose voices and perspectives are present in our materials? Whose are missing?
- Are we treating certain approaches (e.g., market-based solutions) as neutral when they actually reflect specific ideological positions?
- How can we help students recognize when they're operating within a particular narrative versus stepping outside it?

Two-lane approach:

	Lane 1 (Assessment *of)*	Lane 2 (Assessment *for/as)*
Aims	Assess students' capacity to identify and articulate the value-laden narratives embedded in sustainability challenges and proposed solutions.	Create learning environments and activities where students explore and build alternative narratives through authentic engagement.
Formats	Reports/essays of narratives identified; system maps; presentations; interviews.	Process and product portfolios, dialogue journals, reports of stakeholder interviews, (final) interviews.
Criteria	Students show that they can name assumptions, recognize whose interests are served, and explain how different narratives lead to different courses of action.	Students show how their understanding of narratives has evolved; how/when they recognized hidden assumptions; how they surfaced competing value systems; how their perspectives have been shaped.

Illustrated Examples

Examples of activities of how the principle can be translated to learning activities and assessment:

What is Success? (lane 1): Rather than providing predetermined success criteria, students (collectively) define what success means for them in relation to course aims. This makes explicit that assessment criteria reflect values, not objective truth. The resulting criteria might include elements that wouldn't appear in traditional rubrics, like challenging our assumptions or staying curious about complexity. It can also open up the discussion about how does success fit within a broader consideration of what is important to you as professional. As assessment this is a lane 1 assessment, where students are invited to (re-)write criteria in the assessment rubric. Students are assessed on their ability to adjust the original rubric criteria to their own learning goals, now reflecting the values to discuss with the specific student group in question.

Conversation Cards (lane 1): Over several weeks, students build a shared deck of questions to explore their projects. The instruction emphasizes creating questions that reveal blind spots and uncover the potential consequences of design choices. This teaches students to recognize how different questions surface different values and assumptions. As an assessment activity this is a lane 1 assessment, where the conversation cards are used to question students in a final interview. The criteria for this assessment are that the student can name assumptions made, and how different narratives can lead to different courses of action.

Presenting Your Views on Society (lane 2): Students prepare presentations sharing their passions and frustrations about societal challenges. The activity criteria can be co-created with students (what do you expect to see in each presentation?), meanwhile making explicit that how students choose to share their perspectives is itself value-laden. This surfaces different narrative traditions (data-driven analysis, personal storytelling, artistic expression) and acknowledges each as legitimate. The assessment format is presentation, assessed to illicit self-reflection and peer feedback (lane 2). The criteria are co-created with students surrounding ideas on what is important to include in a presentation and how the information should be delivered.

Complexity Mindmap (lane 2): Students collaboratively map connections between societal issues and challenges on a whiteboard, based on prior knowledge or a collectively built knowledge deck on societal issues. The resulting messy systems map makes visible how sustainability challenges are interconnected and value-laden; there's no neutral place to draw boundaries. Students must explicitly discuss: Where do we stop? What do we include? What assumptions guide these choices? How do those decisions expose how we determine what is important? This is a lane 2 assessment where the format is a collective mindmap drawn by the students. The mindmap and following discussion give insight into the student's ability to differentiate between different challenges and articulate their own value-based assumptions about what is worth including and what isn't.

Reflection prompts

- What dominant narratives are most present in your discipline? (e.g., efficiency, optimization, growth, individualism)
- How might you create a design brief for an assessment that explicitly states the value stance from which students should work?
- Where in your course could you invite students to compare how different stakeholders frame the same sustainability challenge?
- What would it look like to have students trace how a particular narrative (e.g., sustainable development) has been contested and reinterpreted over time?

- How comfortable are you with explicitly taking a stance (e.g., this course operates from the premise that infinite growth is impossible)? What institutional or personal barriers do you face?

Common challenges

Challenge: *My institution requires objectivity. I can't take a political stance in my teaching.*
Strategy: Reframe from neutrality to transparency. You're not imposing a view but making visible that every educational choice embeds values. The truly political act is pretending these choices are neutral. Document how making values explicit actually supports academic freedom and critical thinking.

Challenge: *Students expect right answers. When I expose narratives and values, they get confused or frustrated.*
Strategy: Scaffold the shift gradually. Start with smaller activities that surface assumptions before moving to full critique. Use the Headlines from the Future activity (for more info see page 25) to help students articulate multiple possible futures, showing how different values lead to different visions. Acknowledge that uncertainty is uncomfortable but essential for addressing wicked problems.

Challenge: *How do I expose values without indoctrinating students into my preferred narrative?*
Strategy: The key is exposing multiple narratives, including your own positionality. Use activities that help students and educators recognize their own value positions. Focus assessment on students' capacity to identify and articulate different narrative positions rather than adopting a specific correct one.

Challenge: *I don't have time to rebuild everything to make values explicit.*
Strategy: Start small. Add one reflective question to an existing assignment: What assumptions about society/economy/nature does this solution depend on? Check-in with low threshold statements or questions at the beginning of sessions to briefly surface the value frame for that day's topic. Even small acknowledgments shift the hidden curriculum toward visibility.

Design Principle 2: Dialogue-Oriented

Learning environments and activities stimulate meaningful dialogue about who we are, how we relate to each other and the world, and what narratives guide us.

Why it matters

Sustainability transitions aren't just technical challenges requiring better solutions, they're fundamentally about relationships: amongst humans, between humans and non-humans (such as elements of the natural environment), and between the present and future (and past). Addressing societal challenges requires us to examine who we are (identity), and how we relate to other and the world (relationships), and what stories shape our understanding (narratives). Traditional education focuses on developing students' knowledge and skills for professional roles, but transformative learning for sustainability requires deeper work: examining our assumptions about ourselves and our place in the world. This means creating spaces where students can question their relationship to the systems causing sustainability crises and imagine new ways of being.

This dialogue isn't abstract philosophizing, it's essential practical work to make sense of future professional roles. ILO 2 explicitly asks students to "develop their own role in tackling societal challenges." This requires ongoing dialogue about positionality: Who am I in relation to these challenges? What perspectives do I bring? How do my values and experiences shape what I see as possible or desirable? Similarly, ILO 1 asks students to account for climate and sustainability realities, but these "realities" are always interpreted through particular narratives and relationships.

Application guidance

When designing learning activities

- **Create structured spaces for identity exploration**: Design activities that invite students to examine who they are, what experiences shape their perspectives, in relation to sustainability challenges, and how this identity connects to their emerging professional role.
- **Facilitate dialogue about relationships and positionality**: Build in moments where students explicitly discuss how different stakeholders relate to challenges, including power, privilege, and perspective taking (for both humans and non-humans).
- **Surface and examine guiding narratives**: Make space for students to identify and question the stories that shape their thinking – about progress, development, success, nature, humanity – and explore alternatives.

Questions to guide your thinking

- Where could I create space for students to explore who they are becoming through this work, not just what they are producing?
- How might I facilitate dialogue with students and avoid it becoming a debate?
- What activities would help students recognize and question the narratives guiding their assumptions and choices?
- How can assessment value this dialogic self-examination rather than treating it as preparation for "real" work?

Two-lane approach

	Lane 1 (Assessment *of*)	Lane 2 (Assessment *for/as*)
Aims	Assess students' capacity to articulate and reflect on identity, relationships and narratives.	Create learning environments and activities where students develop through ongoing dialogue about identity, relationships, and narratives.
Formats	Reports/essays on own role in addressing societal challenges; stakeholder personas; interviews/dialogue to verify depth of reflexive capacity.	Dialogue journals documentation evolving self-understanding; activities that surface values and positions; portfolio evidence showing identity/narrative evolution; open format for freedom of expression.
Criteria	Students show that they can explain their positionality, recognize how (stakeholder) relationships shape sustainability changes, and identify narratives influencing their thinking.	Students show how their understanding of their identity has evolved, how relationships are (re-)shaped, and how narratives and the way narratives guide their thinking and action have evolved.

Illustrated examples

Polak Game (Where do you stand?)[1]: Students physically position themselves based on whether they see the future as bright or bleak (axis X), and whether they feel they have influence (axis Y). The activity surfaces different narrative positions and opens dialogue about how these positions shape action. For assessment students can be asked to write a reflection report about their own position in relation to the axes, and how this relates to or

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[1] For a full explanation of this learning activity see: The Polak Game, Or: Where Do You Stand? Journal of Futures Studies

is challenged by positions of others. As a lane 1 assessment the criteria would then be related to in what way the students write about their positionality, using examples from their lives and other (practical) references to substantiate their position.

Climate Streamers Card Game: Through storytelling about climate experiences and feelings in small groups, students practice vulnerable dialogue about their relationship to sustainability challenges supported by a deck of cards on societal challenges. The activity acknowledges emotional and personal dimensions often hidden in professional education. As a lane 1 assessment students are asked to write a report reflecting on how narratives shared by others in their group exposed their own assumptions about the world. Criteria are related to the ability to identify narratives and articulate their influence on their understanding of the world.

A Letter to Your Future Self: Students write to their future selves about who they are becoming and what they hope to remember, with a specific 'end' point in mind such as the end of the course, graduation, or 5 years into their professional career. This reflective dialogue makes identity development visible as a legitimate learning outcome. This activity may be done very early in the course, and revisited as a lane 2 assessment towards the middle or end of the course in 1-on-1 interviews where students discuss their growth throughout the course in relation to where they thought they would be. Criteria relate to efficacy of the steps taken to learn (meta-cognition).

Story Cards: Students select images representing who they are and what they bring to the class, using the image as a prompt to sharing personal stories in an introductory round in the first class. This establishes that identity matters to the work and creates space for ongoing dialogue about how different backgrounds and values shape collaborative sustainability work. As a lane 2 assessment students are asked to respond to the image with a new artefact (free format) that shows their growth. Through placing the artefacts from two moments in time next to each other students collectively discuss how they have developed in the course, in relation to each other, and to themselves.

Reflection prompts

- How might I create regular moments for students to reflect on who they are becoming through this work?
- Where could students examine their relationship to the communities, stakeholders, or ecosystems their work affects?
- What activities would help students identify the narratives shaping their thinking and explore alternatives?

- How comfortable am I making space for dialogue about values, emotions, and identity in a "professional" educational context?
- What would it look like to assess students' capacity for this kind of reflexive dialogue?

Common challenges

Challenge: *This feels too personal. Students might be uncomfortable sharing about identity and values.*
Strategy: Scaffold gradually and make participation genuinely voluntary. Start with low-stakes activities like a check-in before moving to deeper reflection. Frame these as professional capacities for sustainability work (which they are). Emphasize that the goal isn't therapy but developing reflexive awareness essential for navigating complex, value-laden challenges.

Challenge: *How is this different from generic reflection activities? We already ask students to reflect.*
Strategy: Generic reflection often asks "what did you learn?" This principle asks "who are you becoming?" Focus dialogue specifically on identity (who am I as a sustainability actor?), relationships (how do I relate to others and the world?), and narratives (what stories guide my thinking?).

Challenge: *I can't assess personal development objectively. How do I grade this?*
Strategy: You're not assessing whether students' identities or values are "correct", you're assessing their capacity for reflexive dialogue about identity, relationships, and narratives. Can they articulate their positionality? Do they recognize how relationships shape challenges? Can they identify and question guiding narratives? These are demonstrable capacities.

Challenge: *Students just write what they think I want to hear about their 'personal growth'.*
Strategy: Use activities that are harder to fake: *Polak Game* requires physical positioning and real-time explanation. *Story Cards* with metaphorical images invite authentic exploration. *Reflection journals* tracked over time show patterns. Focus assessment on evidence of genuine wrestling with questions rather than polished answers.

Design Principle 3: Design Forward

Members of the learning environment emphasise the kinds of relationships and activities that facilitate emergence.

Why it matters

Traditional educational design follows a backwards approach: start with predetermined learning outcomes, design assessments to measure those outcomes, then create teaching activities to achieve them. This assumes we can predict exactly what students need to learn and that the path from ignorance to competence is linear and controllable. But sustainability challenges, by their very nature complex and uncertain, resist this logic.

When futures are uncertain and solutions are not yet known, we cannot predetermine exactly what students need to be able to do. As Mead (1943) argued, we must teach students "to walk so steadily that we need not hew too straight and narrow paths for them but can trust them to make new paths through difficulties we never encountered to a future of which we have no inkling today" (p. 639). This is especially true when students are asked to students to craft context-specific courses of action (ILO 1) and develop their own evolving role in tackling societal challenges (ILO 2). These emerge through exploration, iteration and reflexive engagement with complex realities.

Here's the pragmatic reality for sustainability educators: you work within institutional systems that require learning outcomes, accreditation standards, and demonstrable achievement. Design forward isn't about abandoning these requirements, it's about choosing your battles strategically. Where can you create genuine space for emergence? Where do you need to work within the system? The key is being intentional about these choices rather than defaulting to backwards design everywhere.

This principle connects to the ILOs but shifts how you think about implementation. Sometimes you'll design tightly to "make it work" within institutional constraints, ensuring students demonstrably meet ILO specifications. Other times you'll prioritize transformative learning, creating conditions for emergence even when you can't predict exactly what students will produce. Both are valid. The art is knowing when to do which.

Application guidance

When designing learning activities

- **Choose your battles:** Identify where emergence matters most for transformative sustainability learning and where you need predictable outcomes for institutional requirements. You don't have to redesign everything at once.

- **Specify learning conditions, not learning outcomes:** Define what makes a high-quality learning environment (access to diverse perspectives, space for iteration, authentic stakeholder engagement, time for reflection) rather than only what students will produce at the end.
- **Design courses for iteration and emergence:** Build in multiple cycles of exploration, prototyping, feedback, and revision. Expect student work to evolve in directions you didn't anticipate. That's a feature, not a bug.
- **Make the process visible:** Create ways for students to document and reflect on their learning journey, not just final products. How did their thinking change? What dead ends did they explore? What surprised them?
- **Emphasize relationships that support learning:** Focus on the quality of relationships between students, facilitators, stakeholders, and materials. Strong collaborative relationships enable emergence better than individual work toward fixed goals.

Questions to guide your thinking

- Where in my course does transformative sustainability learning matter most? Where can I afford to prioritize emergence over predictability? Where does predictability hinder learning?
- Where do I face the strongest institutional pressure for predetermined outcomes? How can I meet those requirements effectively?
- What conditions and relationships would support emergence in the spaces I've chosen for it?
- How can I design assessment that satisfies institutional requirements while still valuing unexpected directions?
- Which activities could serve both emergence and accountability?

Two-lane approach

	Lane 1 (Assessment *of*)	Lane 2 (Assessment *for/as*)
Aims	Assess students' capacity to navigate designed learning conditions. Assessment focuses on demonstrated capacities for working within (and pushing against) given conditions rather than arriving at predetermined solutions. This lane often needs to "make it work" by clearly demonstrating ILO achievement.	(Co-)Create learning environments and activities with well-designed conditions for emergence. This lane is where you prioritize transformative sustainability learning and trust the process, giving students the space to define (with you) the outcomes.

Formats	Case analysis with structured constraints; interactive oral assessment responding to defined scenarios; observed practice in authentic context; in-class responses to emerging issues within given parameters.	Journey maps documenting process; portfolio narratives showing evolution; co-created criteria and self-assessment; iterative prototypes with stakeholder feedback; dialogue journals tracking developments.
Criteria	Students show that they work productively given constraints, iterate based on feedback, engage meaningfully with stakeholders and work reflectively.	Students show how they navigate environments and activities designed for emergence, what frameworks they rely on, what values and narratives drive them, how their (deliberate) choices unfolded.

Illustrated examples

Structure courses according to design process models (lane 1): Rather than prescribing what students should create, the course provides a process framework (e.g. d.school: Empathize, Define, Ideate, Prototype, Test) that structures exploration without determining solutions. Students know the conditions for good work but discover their own paths through the process. As a lane 1 assessment the format is an individual presentation and interview where students explain and justify choices that were made in the design process. The criteria are that the students shows how they have iterated based on feedback and worked productively within constraints.

Defining Our Knowledge Cycle (lane 1): Students collectively establish how they will gather, interpret, and use information in their projects. This activity designs the learning environment together rather than following a predetermined research method, acknowledging that different projects may need different approaches. As a lane 1 assessment students submit a 'project plan' that maps how they will structure the learning environment in their project groups (or independently). Criteria focus on how students explain what their 'anchors' will be throughout the learning process to help steer them back towards the aims of the course (such as process models, frameworks or values).

Headlines from the Future & Backwards Storyboarding (lane 2): Students start with their envisioned future success written as headline and work backwards to the present on a storyboard of six frames. This activity makes explicit that the learning journey isn't predetermined, they're designing their own path while the facilitator ensures the conditions support meaningful exploration. As a lane 2 assessment students present and discuss their headlines and storyboards, prompting a discussion on how to make strategic learning decisions when futures are uncertain.

Journey Mapping (lane 2): Students create visual maps of their project journey so far in any format that makes sense to them. The activity encourages students to visualize how they move through the learning process. The activity highlights that the process matters as much as where they end up, and that documenting the journey is itself learning. As a lane 2 assessment students present their drawn journey maps, including the period until now and possible movements (learning actions) moving forward. Criteria will focus on how students explain how decisions were made in their projects, and how they take what they have learnt into future decisions.

Reflection prompts

- Where in my course can I afford to embrace genuine emergence? Where do I need predictable outcomes for accreditation, progression requirements, or institutional politics?
- How does my course create space for students to develop the kinds of capacities sustainability challenges demand, rather than simply acquiring knowledge about sustainability?
- What battles are worth fighting? Where would creating space for emergence have the most impact on transformative learning?
- How might I design activities that satisfy institutional requirements efficiently, freeing up energy for high-impact transformative moments?
- What's one small shift I could make toward design forward without overhauling everything?
- How can I be transparent with students about where we're prioritizing emergence versus meeting system requirements?

Common challenges

Challenge: *I have required learning outcomes. I can't just let emergence happen.*
Strategy: You don't have to choose between ILOs and emergence everywhere. Pick your battles. Design some assessments backwards to effectively demonstrate ILO achievement (satisfying the system). Use the breathing room this creates to design other spaces forward, prioritizing conditions for emergence where transformative learning matters most. Both approaches can coexist.

Challenge: *This sounds idealistic. I'm already overwhelmed trying to make courses work within institutional constraints.*
Strategy: Start small. Choose one activity or assessment where you shift from predetermined outcomes to designed conditions. Keep everything else as is. Use activities like *What is Success?* (see page 16) that let students co-create criteria. This shares the

design work while creating emergence. Design forward can actually reduce your workload by trusting the learning process.

Challenge: *How do I ensure quality if I don't predetermine what good work looks like?*
Strategy: Define what makes a high-quality learning process rather than only what makes a good product. Even when prioritizing emergence, you can have clear criteria for iteration quality, stakeholder engagement depth, and reflexive practice. Students can even develop and write their 'own' criteria by translating your course ILOs and success criteria to language that works for them, so that criteria are personalised without compromising rigor.

Challenge: *Students want clear expectations. Won't this confuse and stress them?*
Strategy: Be transparent about your choices. Explain: "In this part of the course, we're prioritizing emergence, I'm designing the contours but trusting you to find your path. In this other part, we need to demonstrate these specific learning outcomes." Students can handle different approaches in different contexts when the rationale is clear.

Troubleshooting

You might be wondering: where do I actually begin? Here are some entry points:

- **Start with one activity**: Choose a single learning activity to redesign using one principle. See what happens. Learn from student responses. Adjust and expand from there.
- **Start with assessment**: Assessment often feels most constrained by institutional requirements, but it's also where the tensions are most acute. Using the principles to rethink even one assessment component can have ripple effects throughout your course.
- **Start with a problem**: What frustrates you most about assessing sustainability learning in your current practice? Which principle most directly addresses that frustration? Begin there.
- **Start with curiosity**: What would it mean to try dialogue-oriented assessment? What would value-based learning activities look like? What if you designed forward instead of backward? Let questions guide experimentation.

The key is to start somewhere, learn from experience, and build from there. Transformation doesn't happen all at once. It happens through sustained engagement with new ways of thinking and practicing. Remember though: when designing forward focus on the learning environment and type of learning (journey), *not* the outcome.

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