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# Learning Design for Strategic Leadership towards Sustainability



Peter Singer

# How are we to live?

Ethics in an age of self-interest

*'Imagine that you could choose a book that everyone in the world would read. My choice would be this book.'*  
Roger Crisp,  
*Ethics*



OPUS

# Franklin & Marshall College

- Environmental Action Alliance
- Amnesty International
- Save Darfur
- Community Outreach House Coordinator
- F&M Votes Coalition
  
- Also academics 😊: International Environmental Studies





MSLS 2006/2007

Will there be  
enough  
leaders in  
time?

## Become the changemaker the world needs

The Master's in Strategic Leadership towards Sustainability (MSLS) Programme is a 10-month transformational Master's programme in Karlskrona, Sweden that focuses on advancing your knowledge, skills, and global networks, in order to build your capacity to be a strategic leader in the co-creation of thriving, sustainable societies.

More information at: <https://www.bth.se/eng/education/masters/msls/> and <https://www.msls.se/>

# MSLS 2023/2024



# WE ARE MSLS


## ALUMNI MAP

Search

This map is searchable by:  
Name / MSLS year / Location / Home country /  
Organisation / Sector / Interests (e.g. Food)

MSLS year

SHOW ALL

 **A. Eren Öztürk**  
S360 Sustainability Advisory  
Istanbul, Turkey, Turkey

 **Aaron Quesnel**  
Sky Harvest  
Vancouver, British Columbia, Canada


 **Ada Ketchie**  
Northern Flicker  
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 **Adrian Mohareb**  
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SAME DROP  
San Francisco, CA, United States of  
America (USA)

 **Alexandre Magnin**  
AM Creative Inc.





My intellectual and professional home

## Department of Strategic Sustainable Development (TISU)

### Our Mission

...is to advance *leadership* and *innovation* for sustainability through collaborative scientific research and higher education.

We develop methodological support and competence for organizations and individuals all over the world that want to create change for sustainability *systemically, systematically and strategically*.



## Blekinge Institute of Technology

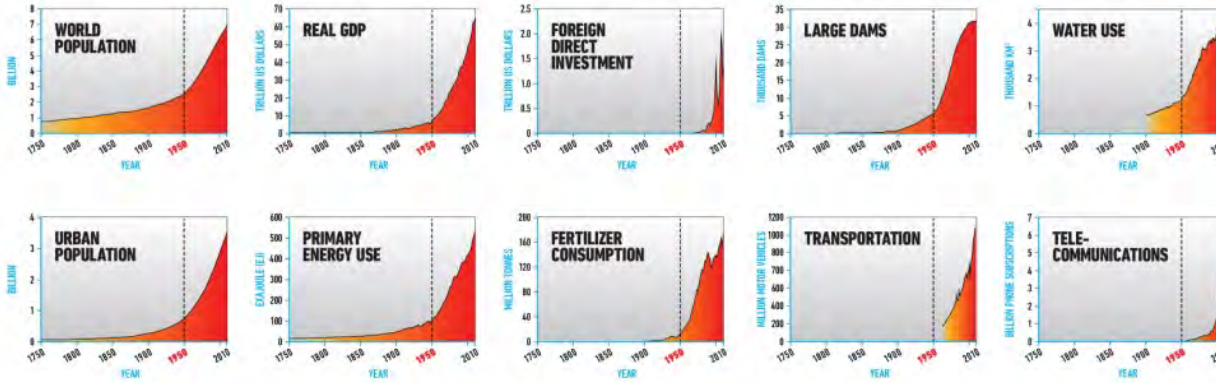
*A better world through  
knowledge, expertise and  
innovation in  
digitalisation and  
sustainability.*

BTH is a knowledge-driven organisation centred on use and application, and as such we are a driving force in the transition to a sustainable and more digital society.

A close-up photograph of a person's hands holding a small, round, woven basket. The basket is made of blue and white threads, with a colorful, multi-colored band around its rim. The background is a blurred, patterned fabric with geometric shapes in red, yellow, and green. The text is overlaid on the basket.

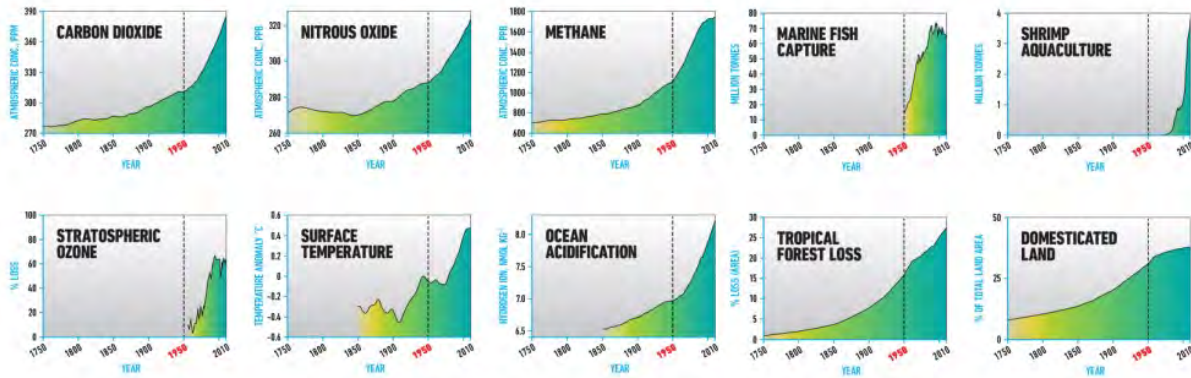
So why...  
Strategic  
Leadership  
towards  
Sustainability

## Socio-economic Trends

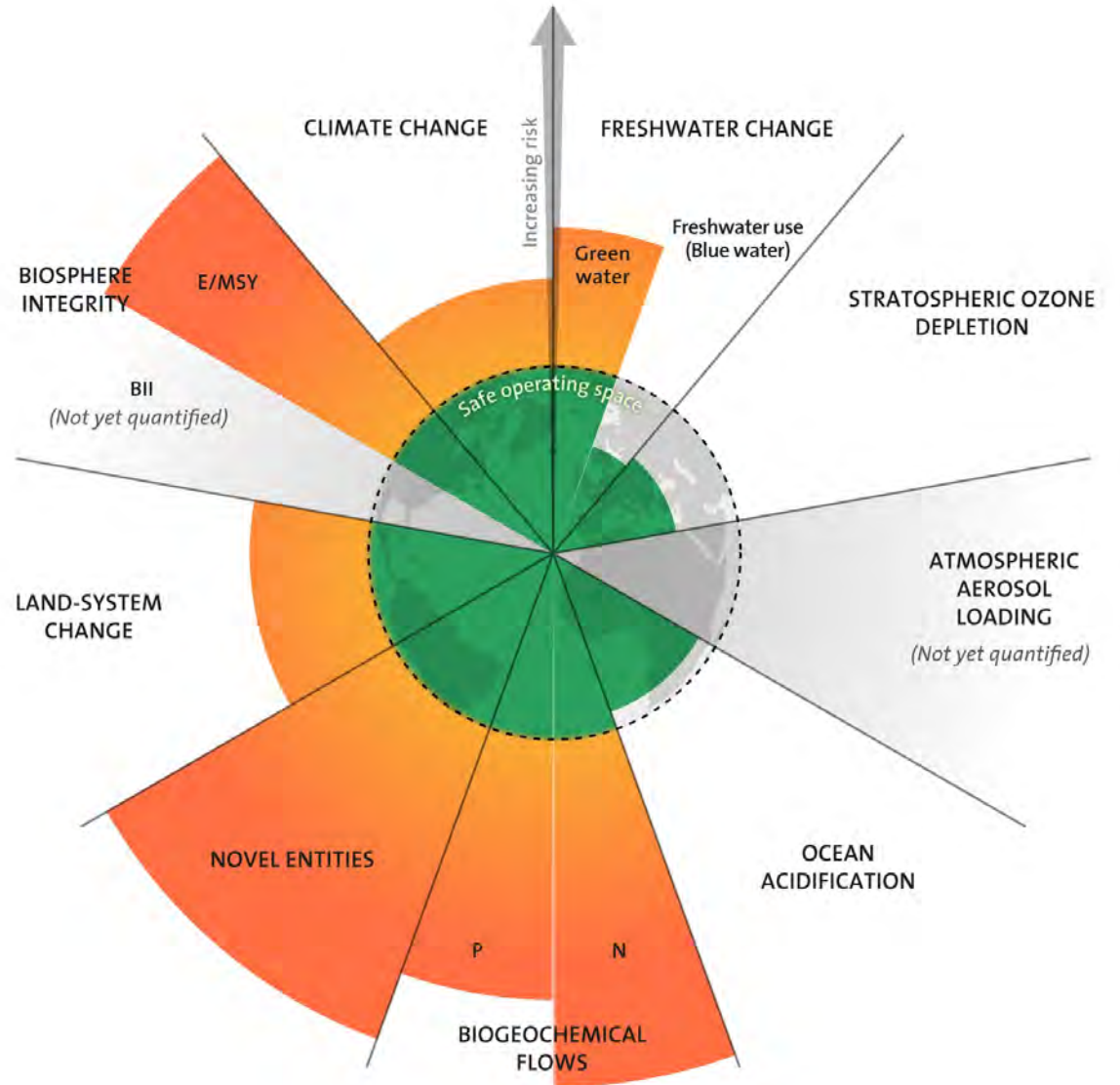


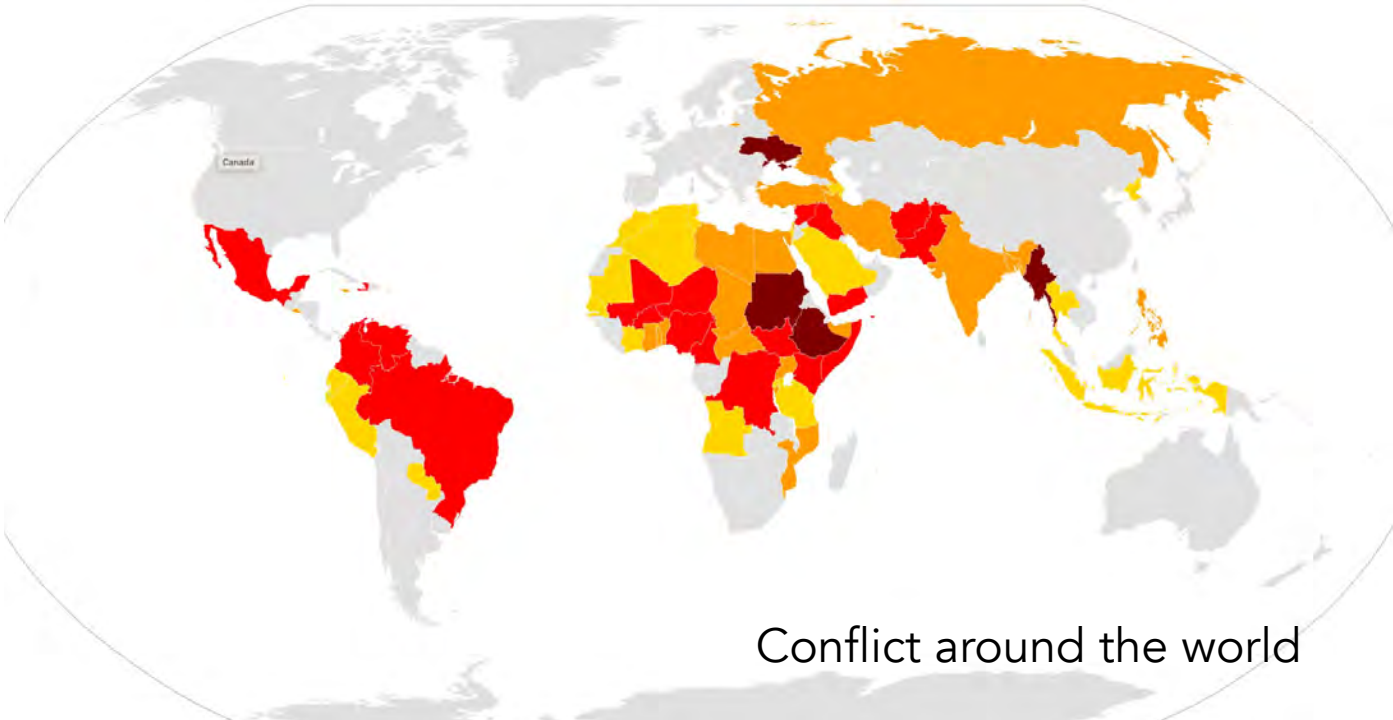
All indicators show exponential growth

## Earth System Trends



All indicators show exponential growth

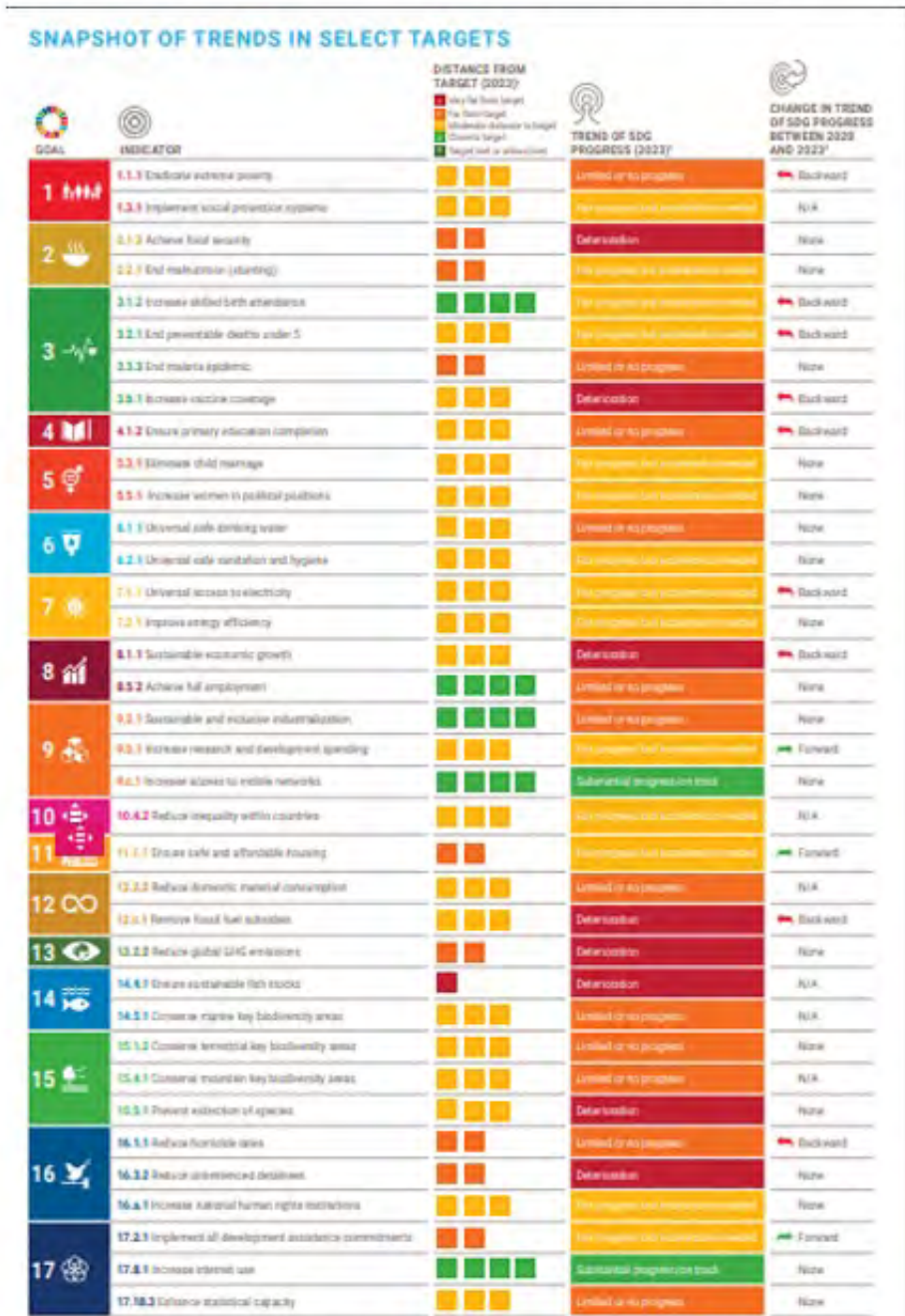




Conflict around the world



Figure 1-1: Current state of progress toward the SDGs based on select targets



## 2023 snapshot:

- Only 5 indicators are on target to reaching goal
- 9 Are far or very far from target
- 22 in between

## Trends over time:

9 indicators going backwards

3 going forwards

The rest have no change in movement

# THE WORLD WE LIVE IN

"Concurrent shocks, deeply interconnected risks, and eroding resilience are giving rise to the risk of polycrisis – where disparate crises interact such that the overall impact far exceeds the sum of each part.

- World Economic Forum, 2023

"The world is a complex, interconnected, finite, ecological-social-psychological-economic system. We treat it as if it were not, as if it were divisible, separable, simple, and infinite. Our persistent, intractable global problems arise directly from this mismatch."

- Donella Meadows

'For every complex problem there is an answer that is clear, simple and wrong'

- HL Mencken

A close-up photograph of a person's hands holding a small, round, woven basket. The basket is made of blue and green threads, with a colorful, multi-colored band around its rim. The background is a blurred, patterned fabric with geometric shapes in red, yellow, and green. The text is overlaid on the center of the image.

**What is...**  
**Strategic  
Leadership  
towards  
Sustainability**







# What is SSD?

A science-based overarching and intentionally unifying lens and approach to understanding sustainable development and to create change for sustainability in a systemic, systematic and strategic way.

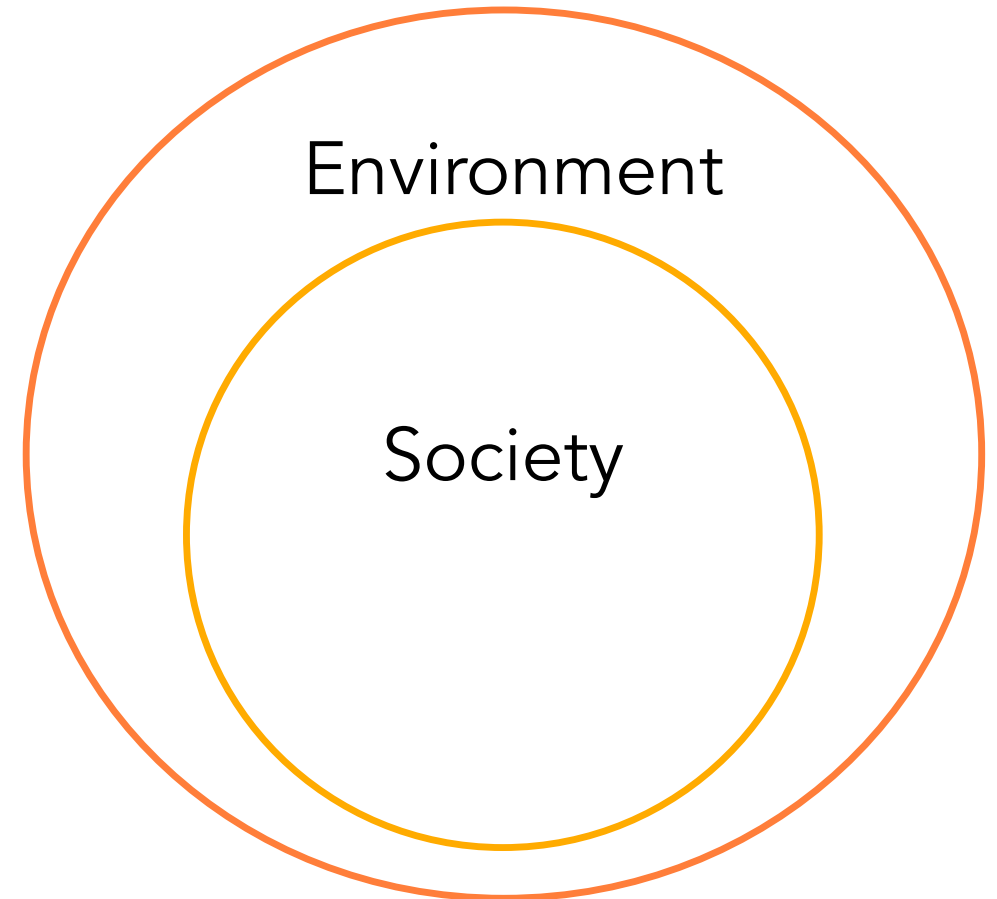


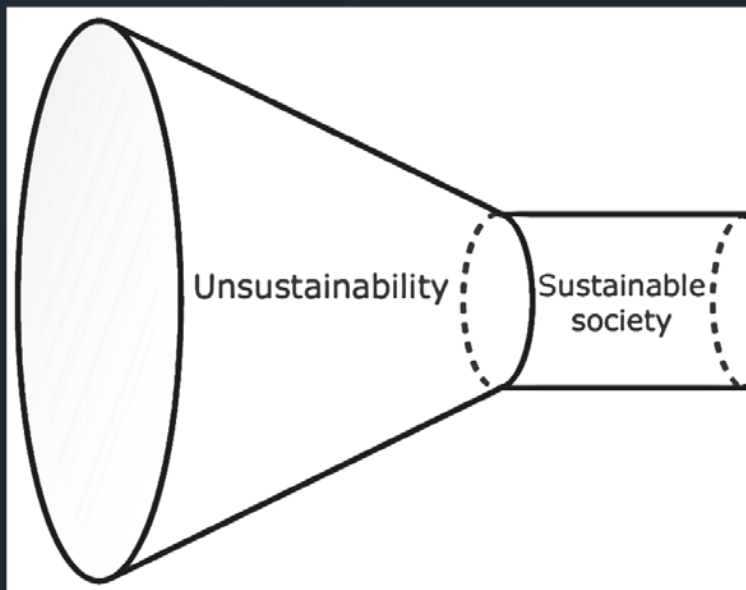
In order to achieve sustainability

**Nature** must not be systematically degraded

**Social systems** must not be systematically degraded

Both are needed





# UN-SUSTAINABILITY AS A FUNDAMENTAL SYSTEMS DESIGN ERROR

# Design errors

## Basic mechanisms of destruction (4-8)



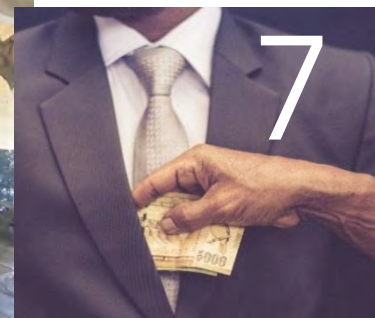
Health



Influence



Competence



Impartiality



Meaning-making

# Social sustainability principles



In a socially sustainable society, people are not subject to structural obstacles to...

4...health (e.g. by dangerous working conditions or insufficient rest from work).

5...influence (e.g. by suppression of free speech or neglect of opinions).

6...competence (e.g. by obstacles for education or insufficient possibilities for personal development).

7...impartiality (e.g. by discrimination or unfair selection to job positions).

8...meaning-making (e.g. by suppression of cultural expression or obstacles to co-creation of purposeful conditions).

What have I learnt  
based on my research  
since then?

RESEARCH

DESIGN



IT'S A MESS

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# What does the field\* say?

\* Business management,  
Product development ,  
Supply chain management

- Poor definition of social sustainability
- Picking (sometimes seemingly random) issues
- Lack of systems and the science-based understanding of social sustainability and goal-setting
- Lack of ability to deal with (conflicts and tradeoffs between) issues strategically
- Lack of clarity how to best use existing tools
- Limited research on structures and processes for implementation and integration
- Lack of empirical data and support informed by the realities of practice
- Fragmented organizational structure hinderance to collaboration on these issues
- Lack of true integration rather than stand-alone and add-on approaches and tools
- More dynamic processes of working with these issues lacking



## *Towards a Clearer Definition of Social Sustainability Based on a (Systems) Science Understanding and Deriving Goals Thereof*

*A more explicit engagement with and discussion of social-system-science-based ideas.*

*A more explicit determination as a field to converge on key pieces leading*

### *Practice-Based Research on Sustainability Integration:*

Understanding current practices and supporting the design of better processes, structures and practices together with organizations.

Three particular practice-based research focus areas emerge.

- *How to overcome fragmented organizational structures.*
- *How to achieve true integration into existing processes and tools.*
- *How to support organizations to become more dynamic*

# Company Case Studies

Dimensions	PD organization A	PD organization B	PD organization C
<i>System boundaries</i>	<ul style="list-style-type: none"> <li>Narrow view of interdependencies with other social systems beyond own organization</li> <li>Focus on own employees' wellbeing and their immediate surrounding community</li> <li>Product lifecycle aspects limited to safety concerns at own manufacturing and use phase</li> <li>First tier suppliers expected to comply with company's code of conduct (no evidence of verification)</li> </ul>	<ul style="list-style-type: none"> <li>Broad view of interdependencies with other social systems</li> <li>Engagement with actors up- and downstream the value chain</li> <li>Product Lifecycle thinking driving how system boundaries are set</li> </ul>	<ul style="list-style-type: none"> <li>Narrow view of interdependencies with other social systems beyond own organization</li> <li>Focus on own employees' health and safety</li> <li>Product lifecycle aspects limited to safety concerns at own manufacturing and inconsistently at use phase</li> <li>First tier suppliers expected to comply with social sustainability related requirements (ad hoc verification)</li> </ul>
<i>Success</i>	<ul style="list-style-type: none"> <li>Weak knowledge and awareness of social sustainability concepts</li> <li>Social sustainability agenda defined by expectations from local/national stakeholders and industry requirements</li> <li>Existing goals for employees are defined at site level and for product social performance by industry standards</li> <li>Organization's success not seen as dependent on thriving social systems</li> </ul>	<ul style="list-style-type: none"> <li>Good knowledge and awareness of social sustainability concepts</li> <li>Social sustainability agenda defined by international standards and multi-stakeholder expectations</li> <li>Goals are defined at corporate level and embedded in the corporate culture</li> <li>Organization's success seen as dependent on thriving social systems</li> </ul>	<ul style="list-style-type: none"> <li>Uneven knowledge and awareness of social sustainability concepts</li> <li>Social sustainability agenda defined by demands from local/national authorities</li> <li>Existing goals for employees are defined at site level and for product social performance by customers</li> <li>Organization's success not seen as dependent on thriving social systems</li> </ul>
<i>What guides strategic decisions</i>	<ul style="list-style-type: none"> <li>Compliance and competitiveness</li> <li>Risk and cost avoidance</li> <li>Present and future customer needs</li> </ul>	<ul style="list-style-type: none"> <li>Branding and reputation through core values</li> <li>Building trust among societal actors</li> </ul>	<ul style="list-style-type: none"> <li>Branding through product quality</li> <li>Compliance and competitiveness</li> <li>Risk and cost avoidance</li> <li>Expressed customer needs</li> </ul>
<i>How internal work is structured</i>	<ul style="list-style-type: none"> <li>Code of conduct defined at top management level but no clear processes to "bring it to life"</li> <li>Social sustainability aspects not explicitly anchored at any level of the organization</li> <li>Uncoordinated efforts at the tactical level and no structured collaboration between functions</li> <li>First initiatives at product development level but without clear possibilities to influence higher levels of decision-making</li> </ul>	<ul style="list-style-type: none"> <li>Social sustainability anchored alongside ecological sustainability at the strategic level of the organization, where strategic guidelines are defined</li> <li>Multiple managerial functions develop specific strategies aligned with corporate values</li> <li>Vertical flow of information and support for decision-making</li> <li>Horizontal collaboration through cross-function dialogue routines</li> </ul>	<ul style="list-style-type: none"> <li>No social sustainability guidance from top management</li> <li>Social sustainability aspects not explicitly anchored at any level of the organization</li> <li>Uncoordinated efforts at the tactical level and no structured collaboration between functions</li> </ul>

# The Organization of Social Sustainability Work in Swedish Eco-Municipalities.



**Table 4.** Positions and structures by theme.

Theme	Mentions
Public Health	21
General Sustainability + Agenda 2030	5
Development + Growth	5
Safety + Security + Crime Prevention	5
Integration	4
Social Services	4
General Strategy Unit	3
Social Sustainability	3
Culture + Leisure	3
Environmental + Climate and Energy	3
Anti-violence	2
Children and Youth	2
Human Resources	2
Democracy	2
Family + Education	2
Function Rights + Accessibility	2
Mother tongue responsible	1
ANDT	1

*Themes of Visions and Goals for Social Sustainability:* Most listed their goals as increasing or decreasing the themes of the scope, e.g., increase equality, decrease crime, etc., or even just the general theme, e.g., Human Rights, Agenda 2030, or “Good Public Health”.

## Best Practice

Creating additional structures for collaboration across departments, with external actors, and across sectors to at least partly overcome the silo approach engrained in a municipal structure.

Active involvement of leaders  
Clear mandates  
Common vision for social sustainability





# Social Sustainability in Engineering Education

Students struggle with

- Awareness of social issues in general
- Literacy of social issues
- Understanding a task that asks them to reflect on this systematically
- To build on prior knowledge where existing (e.g. use phase only)
- Making connection to products and the relevance for their field of study (even after exposure)

Students were often over-confident in their own knowledge (as shown in a discrepancy between their own assessment of their knowledge on social sustainability and their demonstrated knowledge on a task)



# Learning Support

A 3D bar chart with colorful bars of varying heights, representing data or progress. The bars are in shades of yellow, pink, orange, red, green, blue, and purple. The chart is set against a dark background and is slightly out of focus, with the foreground bars being sharper than the background ones.

It has become clear that creating support quite practically means helping organization and students to see and do things differently in terms of social sustainability work.

It is not so much the practical tools that are needed, although they are also important, but a more systemic and strategic understanding of the field that is imperative for organizations to move forward their work in this field.



# Learning Design for



1



A social sustainability  
mapping process

Municipality identifies actors across sectors of society to participate in 3 rounds of surveys

### Round 1:

- What challenges do you see in the municipality regarding social sustainability?
- Researcher use social sustainability principles to analyze and categorize

### Round 2:

- Summary shared with participants
- What other challenges do you see in regards to health, influence, etc.
- Summary is updated and shared again

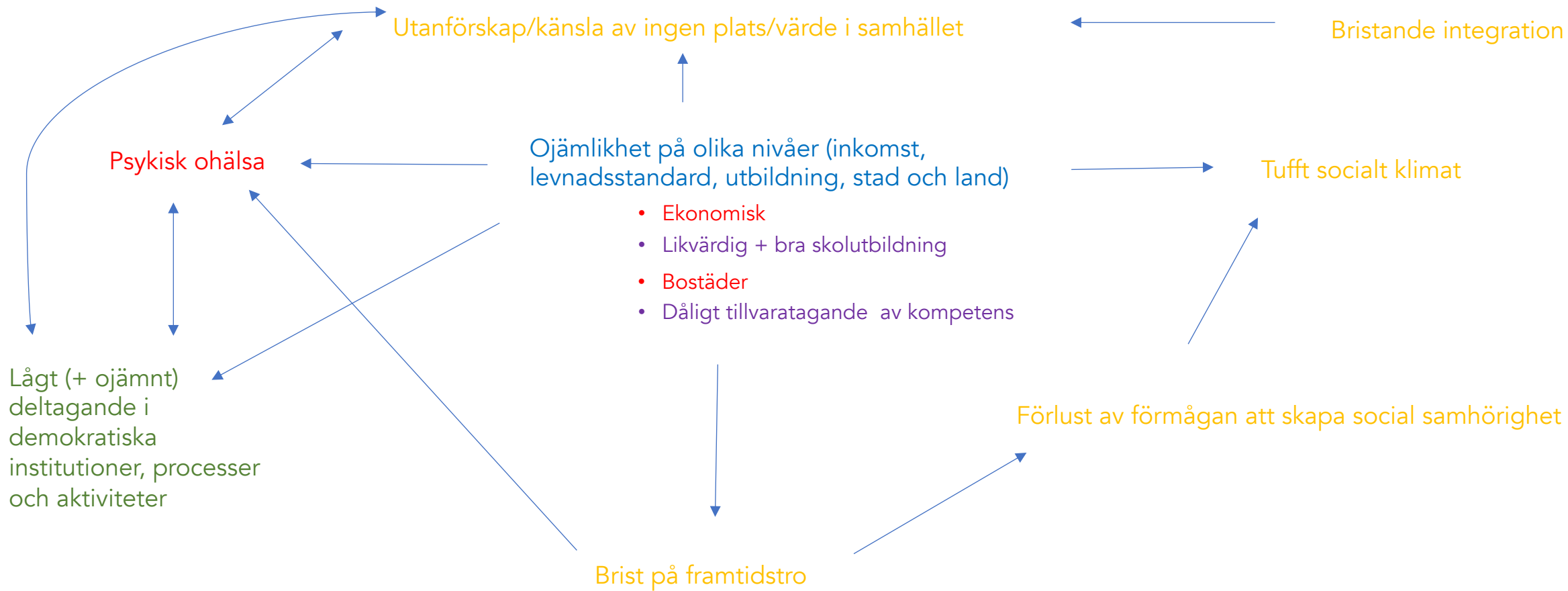
### Round 3:

- Which structures or lack thereof contribute to these issues?
- Final result is presented





HÄLSA	INFLYTANDE	KOMPETENS	OPARTISKHET	MENINGSSKAPANDE
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Attraktiv for new competence

HÄLSA	INFLYTANDE	KOMPETENS	OPARTISKHET	MENINGSSKAPANDE
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# 2

## An organizational typology

Dimensions and attributes / Types		Insular	Connected	Systemic
<b>System boundaries</b>	<i>View of interdependencies with social systems beyond organization</i>	Absent	Expanding	Broad
	<i>Main focus</i>	Inward-looking, limited to own employees' health and safety	Inward-looking, limited to own employees' wellbeing and the communities they are part of	Outward-looking, all stakeholders upstream and downstream value chain
	<i>Product lifecycle thinking</i>	Limited to safety concerns at own manufacturing	Safety concerns at own manufacturing and use phase, begin to work with raw material extraction activities, e.g. phasing out conflict minerals	Full lifecycle dictates system boundaries
	<i>Value-chain engagement</i>	Demands ethical behavior from first tier suppliers (no verification)	Demands ethical behavior from first tier suppliers (ad hoc or systematic verification)	Engages multiple actors throughout whole value chain to jointly contribute to social sustainability goals
<b>Success</b>	<i>Awareness of social sustainability concepts</i>	Weak	Medium	High
	<i>Social sustainability definition</i>	Loosely defined and agenda guided by demands from local/national authorities	Expectations from local/national stakeholders and industry requirements	Derived from a socio-ecological systems perspective
	<i>Goals</i>	Incremental, based on industry standard and at site-level	Incremental, based on industry standard stakeholder engagement; site-level; product-focused	Science-based, defined at corporate level and embedded in the corporate culture
	<i>Relationship between organization's social sustainability and other social systems' social sustainability</i>	Seen as independent	Seen as dependent	Seen as interdependent
<b>What guides strategic decisions</b>	<i>Motivating factors</i>	Compliance	Social license to operate; Branding and reputation, focus on product safety and quality; Competitiveness	Branding and reputation, focus on core values; Building trust among societal actors, Organization's long term survival
	<i>Risk management</i>	Cost related risks must be avoided	Reputation and cost related risks should be managed	Opportunity focus, social value creation
	<i>PD focus</i>	Expressed customer needs	Present and future customer needs	Societal needs
<b>How internal work is structured</b>	<i>Top-management's role</i>	No involvement	Defines code of conduct with unclear processes and ad hoc initiatives to "bring it to life"	Multiple managerial functions develop strategies aligned with corporate values
	<i>Is social sustainability explicitly anchored at the strategic level of the organization?</i>	No	Yes	Yes
	<i>Social sustainability work at the tactical level</i>	Uncoordinated; no structured collaboration between functions	Unstructured collaboration between functions	Horizontal collaboration through cross-function dialogue and routines
	<i>Integration of social sustainability work between the strategic, tactical and operational levels</i>	No integration	First initiatives at PD level with limited possibilities to influence higher levels of decision-making	Vertical flow of information and support for decision-making

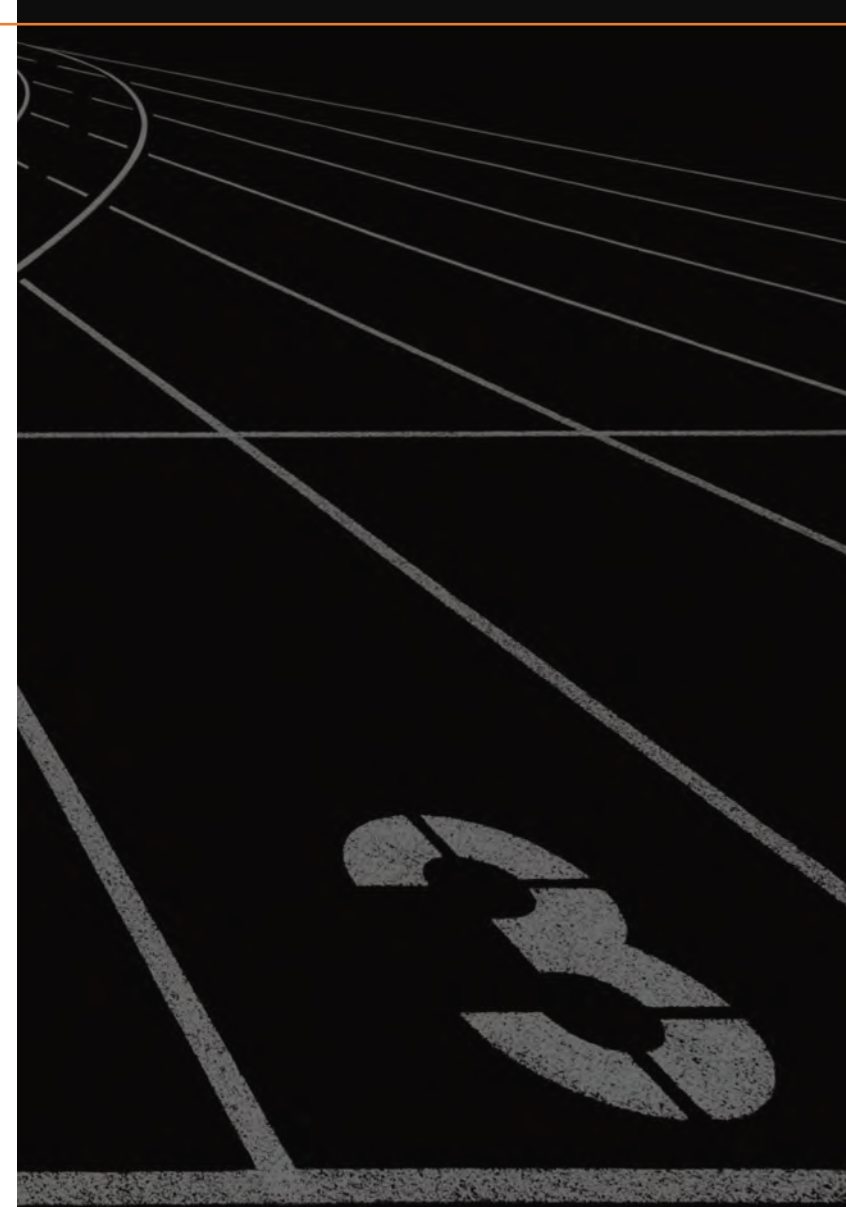
# Typology

- serves as an analytical tool by bringing clarity to important elements that differentiate social sustainability approaches
- helpful in framing discussions and providing direction for product development organizations who wish to truly progress in their sustainability journey.





# Scaffolded Learning Aid for students







Raw material extraction

INTERNAL	
SP4	
SP5	3
SP6	
SP7	
SP8	





Steel production


INTERNAL	
SP4	
SP5	
SP6	
SP7	
SP8	




transportation




Manufacturing



retail & store



KITCHEN KNIVES



reduce reuse recycle

Contributions to "External" context

Where in the world?	1	Potential positive contribution to combat structural obstacles	Potential contribution to structure
SP4. ... structural obstacles to health.			
SP5. ... structural obstacles to influence.		4	
SP6. ... structural obstacles to competence.	2		
SP7. ... structural obstacles to impartiality.			
SP8. ... structural obstacles to meaning-making.			

1. Research the location
2. Note structural obstacles that are prevalent in that country/area

A good country overview is provided by:

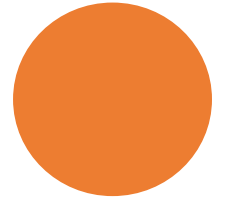
<https://www.amnesty.org/en/countries/>

<https://www.socialprogress.org/>

1. What structural obstacles may exist within the organization regardless of its external context?
2. Brainstorm actions that the company might take to help combat the existing "external" structural obstacles

## Our scaffolded learning aid did help students

- To overcome the challenge of lack of prior knowledge
- To expand their scope
  - A more complete lifecycle perspective
  - Considerations for different stakeholders (not only employees)
- To think about context, i.e social conditions of the location of different lifecycle activities
- To reflect on root causes (structural obstacles) of problems in order to support action later on
- To create better assessment and to **LEARN** in the process





# Key Learnings

- Students who performed extremely well would have likely used a similar structure on their own
- Students with better results also appreciated the guidance more (demonstrated understanding of complexity and that the structure helps)
- Majority: We need to start at very basic level with familiarizing them with social issues (around the world) in general and helping them to understand why these issues are relevant also for engineers.



# Before



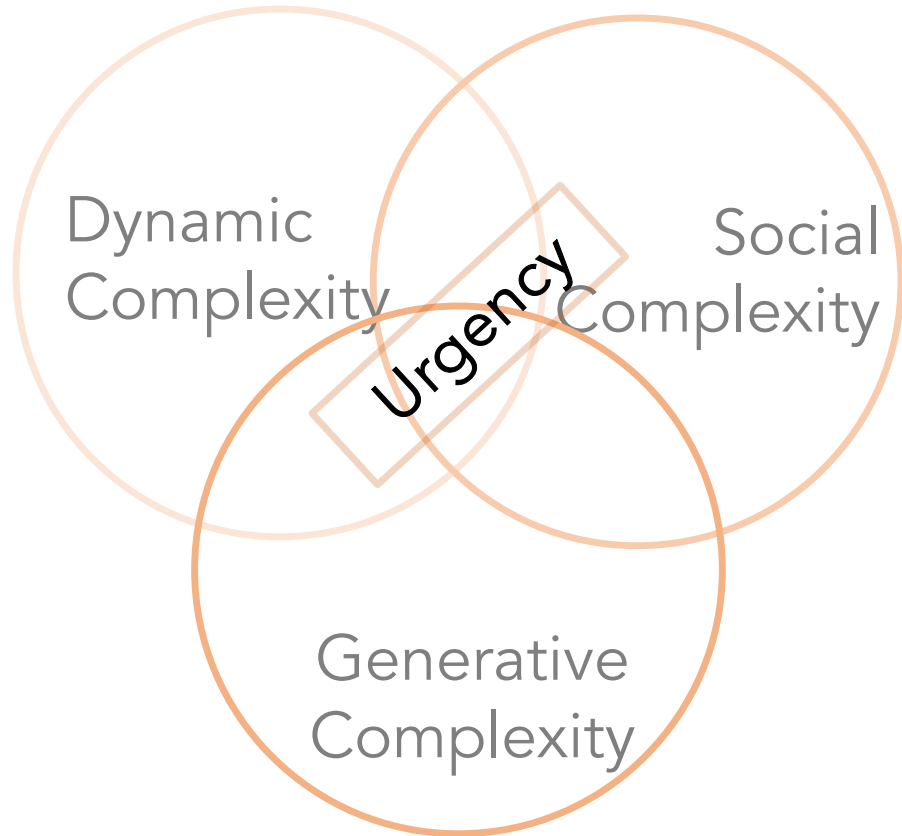
Missimer, M. & T. Connell. 2012. "Pedagogical Approaches and Design Aspects To Enable Leadership for Sustainable Development." *Sustainability: The Journal of Record*: 172-181.

Missimer, M., Valente, M., Meisterheim, T. and P. Johnson. 2013. "Creating a Learning Environment for Transformation: a Case Study of a Course in Sustainability Leadership". In: *Leading Transformative Higher Education* / [ed] Hampson, Gary P; Rich-Tolsma, Matthew, Olomouc: Palacký University.

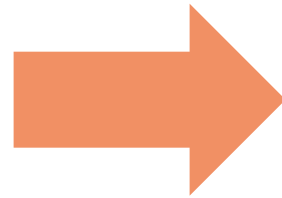
What have I learnt based on my research since then?

# The context

The nature of the challenge



requires



Particular solutions

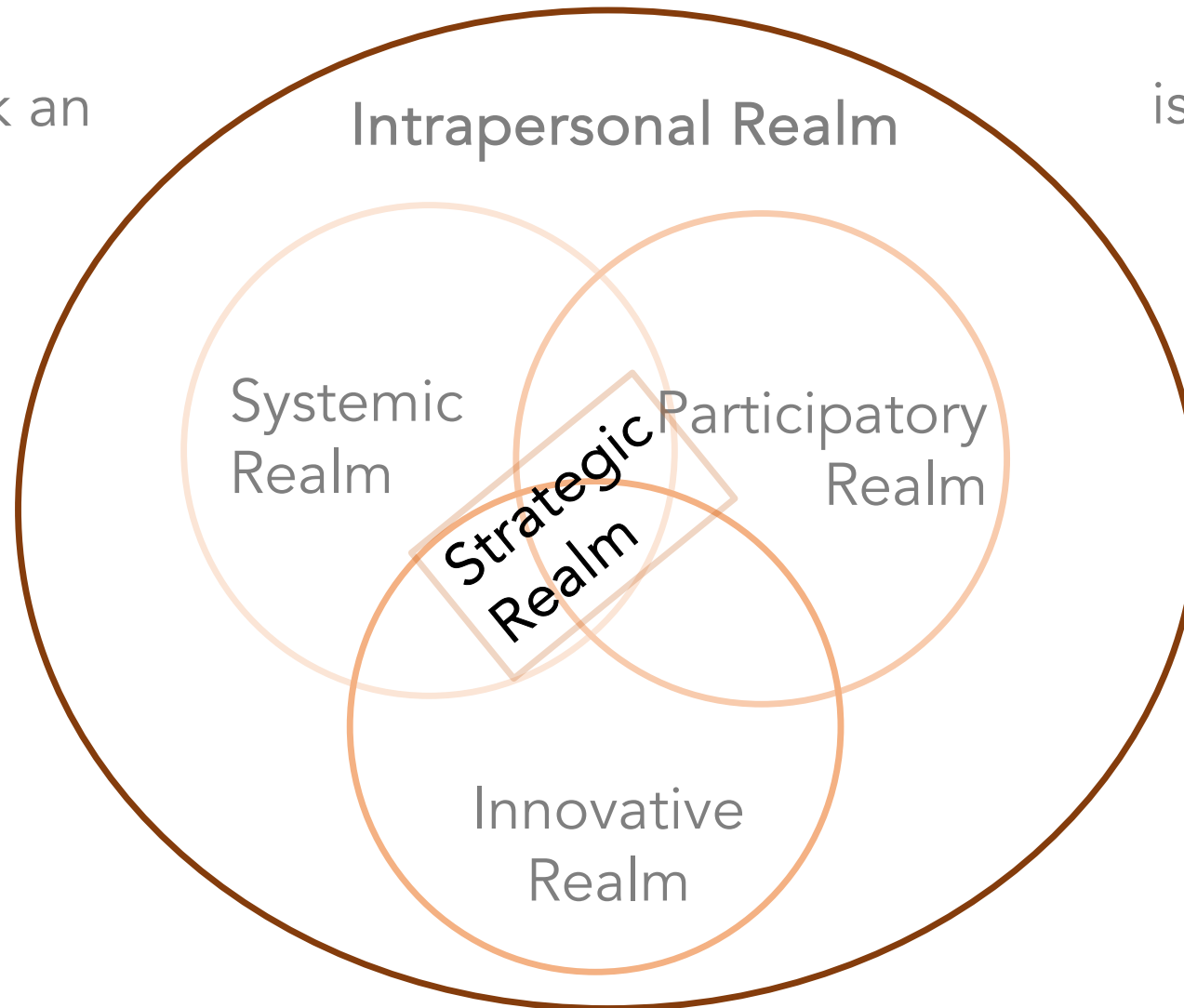




# MSLS Leadership Capacities

To do this work an

is also required



This is about the inner work required to be effective actualizing the other capacities

# "Our Map"

STRATEGIC  
REALM

SYSTEMIC  
REALM

Take systems and complexity approaches  
Utilize strategic thinking and planning  
Make use of systems change theories

INNOVATIVE  
REALM

Question current situation  
Develop & inspire shared vision  
Propose and test new solutions  
Get to action

PARTICIPATORY  
REALM

Work well in diverse teams  
Plan and execute participatory processes  
Motivate and engage others  
Build alliances

INTRAPERSONAL REALM

The capacity to...

... hold complexity.

... foster a learner's mindset.

... deeply value others.

... to let be.

... show up as one's full self.

... regulate and manage the self.

... persist with lightness.

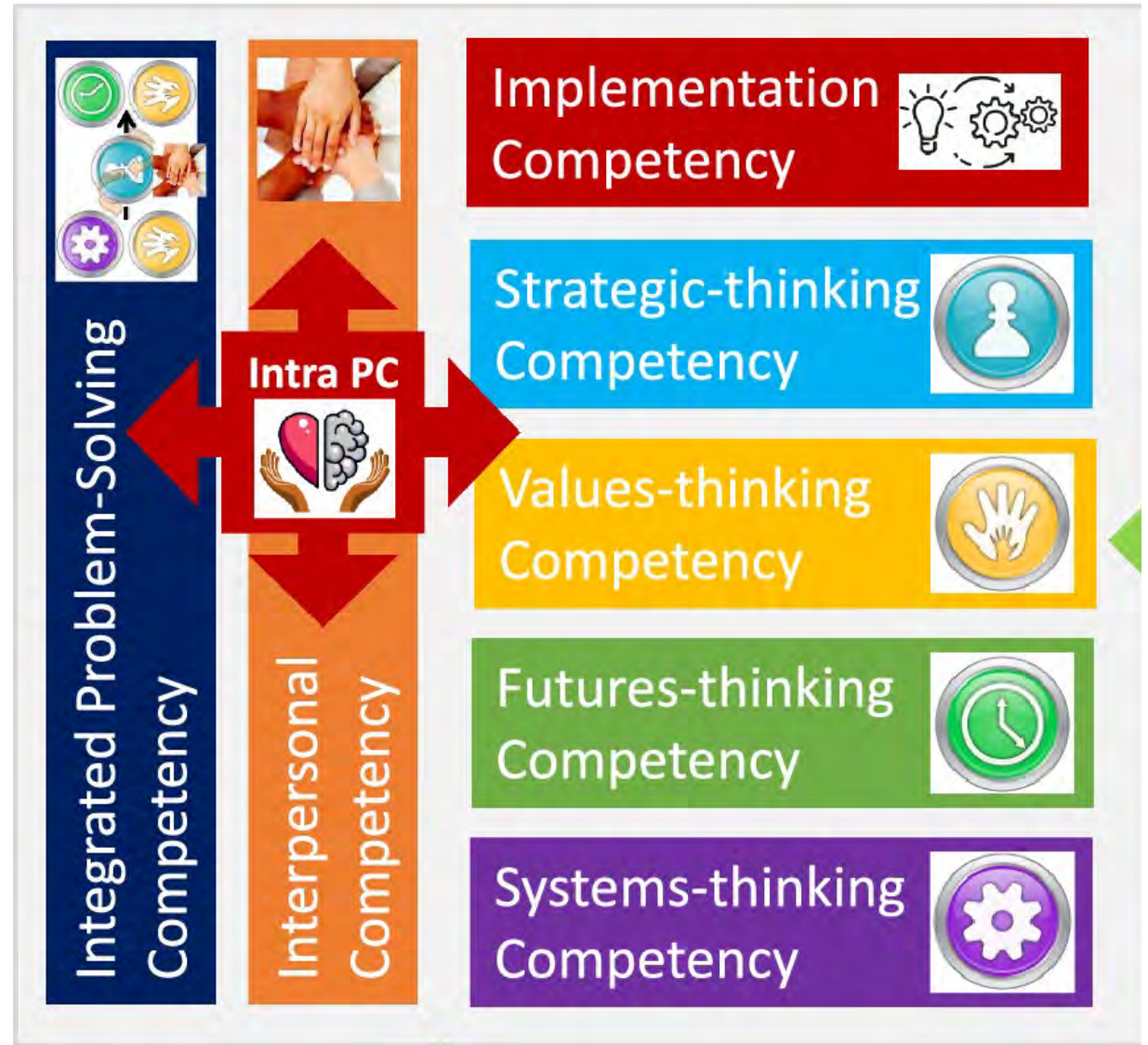
... ensure one's wellbeing.

# INTRAPERSONAL CAPACITIES FOR SUSTAINABILITY LEADERSHIP

<b>The ability to...</b>	<b>Description</b>
<b>...hold complexity.</b>	The ability to cope with large amounts of information, uncertainty, ambiguity, and paradox.
<b>...foster a learner's mindset.</b>	The ability to be curious and renew one's knowledge, skills and perspective.
<b>...deeply value others.</b>	The ability to see and honour diverse perspectives and people.
<b>...to let be.</b>	The ability to be present, accept what is and let go of attachments.
<b>...show up as one's full self.</b>	The ability to show one's strengths, weaknesses, values, and vulnerability.
<b>...regulate and manage the self.</b>	The ability to cultivate self-awareness of one's reactions and balance them when needed.
<b>... persist with lightness.</b>	The ability to persevere with positivity and cultivate optimism and hope.
<b>...ensure one's wellbeing.</b>	The ability to ensure the mental, physical and emotional resources required.

# KEY COMPETENCIES IN SUSTAINABILITY

Image from: Brundiers, K., Barth, M., Cebrián, G. *et al.* Key competencies in sustainability in higher education—toward an agreed-upon reference framework. *Sustain Sci* **16**, 13–29 (2021).



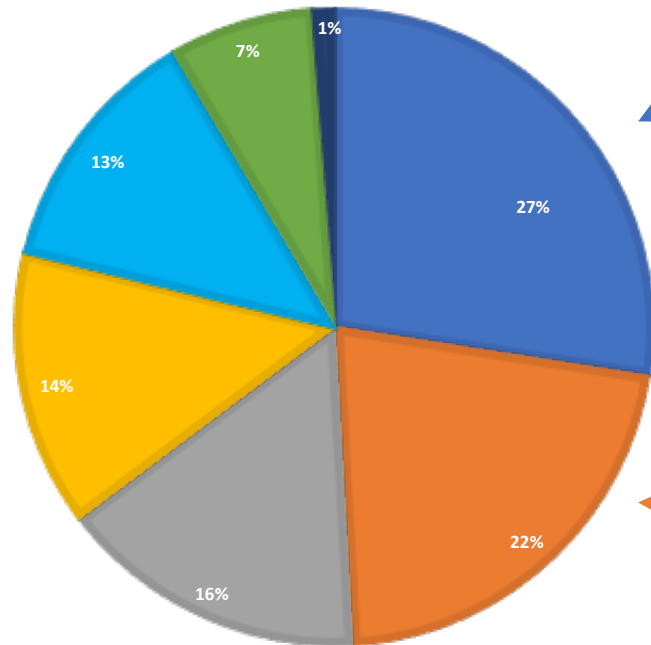
# Learning Design for



# WHAT TRANSFORMS?

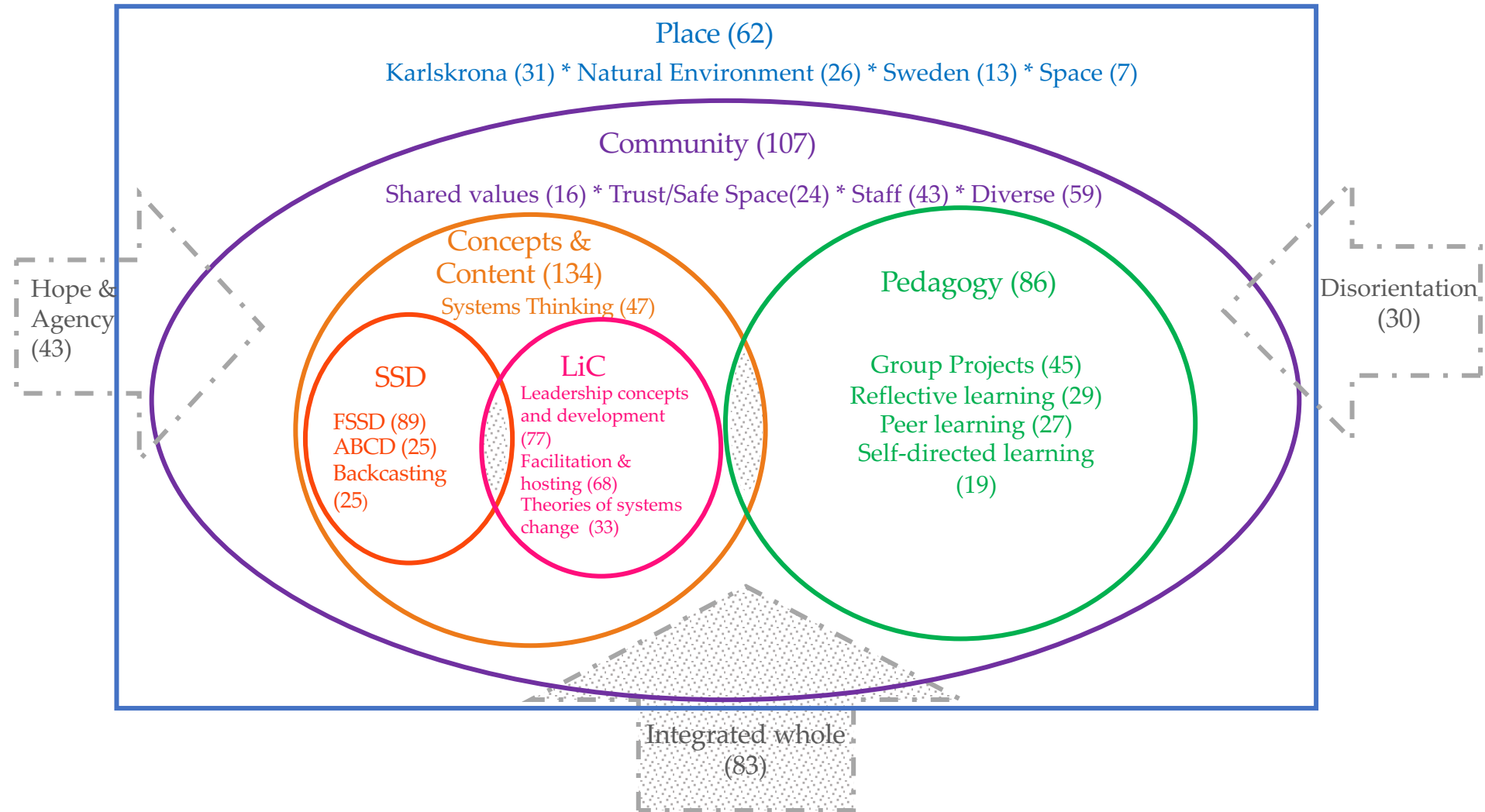
WHAT TRANSFORMED FOR GRADUATES OF THE MSLS PROGRAM  
MAPPED TO THEMES OF TRANSFORMATIONAL LEARNING

■ Self  
■ Worldview  
■ Behaviour  
■ Epistemology  
■ Ontology  
■ Capacity  
■ Other/negative aspects



Code or Sub-theme (from Hoggan 2016)	#of people	A direct quote from respondent
<b>1. Self: Self-in-relation to others/World.</b>	73	It helped me see that I am not alone in thinking that we should be more authentic in our leadership in this world. That we have separated self from organisation and that precludes us from having a transformative impact (case 35).
<b>2. Worldview: More comprehensive or complex.</b>	55	It has given me a different perspective on my daily life; I gained the ability to zoom out of a situation and see the bigger picture (case 42).
<b>3. Self: Self-knowledge.</b>	52	A new perception and understanding of myself and my capabilities (case 31).
<b>4. Ontology: Ways of being.</b>	48	I can see and feel that I'm a different person than the one I was before coming to MSLS. It's about the combination of the content and the way I get to practice being in the world that has been of massive value to me (case 103).
<b>5. Self: Empowerment / Responsibility.</b>	46	Personally - it equipped me with a stronger sense of considering myself as a changemaker and gave me inner strength (case 8).
<b>6. Worldview: New Awareness /New Understandings.</b>	43	Some of the contents, such as the FSSD, or systems thinking, or Theory U where thresholds that changed my worldview and mindset of how the world works and what is my role in it (case 200).

# WHAT SUPPORTS THE TRANSFORMATION?



# DIVERSITY, REFLECTION AND DIALOGUE

*Holds benefits for collaboration, self-awareness, understanding of multiple perspectives, and creating self-directed graduates.*

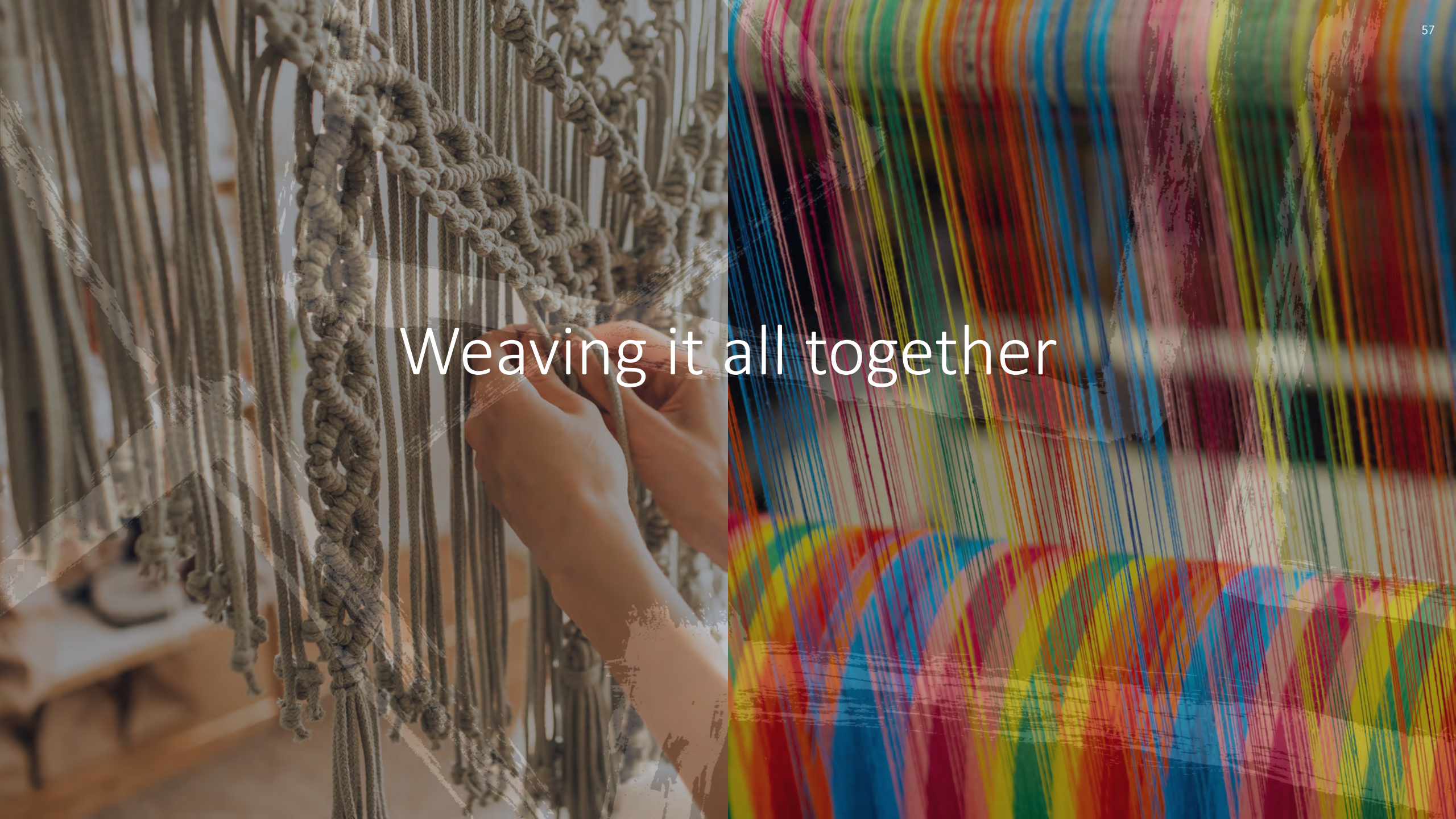
*Challenging pedagogy:*

- *Different student needs*
- *emotional and mental load faced by staff in hosting and holding students through often challenging personal reflective processes.*
- *Requires institutional structures to support them*





Weaving it all together





# Learning Design for Strategic Leadership towards Sustainability

- Urgency in the world
- We need to helping organization and students to see and based on that do things differently
  - Seems obvious and
  - ... a systems perspective, complexity and learning mindset are real threshold concept
  - ... and we are not set up to accommodate the implications of it
  - ... the kind of leadership needed is vastly different than what we are used to
  - ... the Research field is moving way too slow, especially in social sustainability

# Learning Design

for

## Strategic Leadership towards Sustainability

### Organizations

- Sometimes needs to be disguised (everyone wants answers, not transformational learning)
- Empowerment is actually not always wanted
- Dynamic and iterative, a slowly expansive process

### Students at basic level

- Needs to start very basic
- Scaffolded
- Be courageous and needs collective commitment

### Students at advanced level

- We know how to effectively do this
- Research has brought scientific language to our practice and of course, made it better
- The question is how to transfer these lessons to other scales/places
- Is very intense work and needs institutional commitment

# Acknowledgment & Thank you

- The whole department
- Co-authors: Tita, Lisa, Jayne, James, Göran
- MSLS team
- Students
- Andre & Mia



# Papers and Methods

1. *Missimer, M. & P.L. Mesquita. 2022. Social Sustainability in Business Organizations: A Research Agenda. Sustainability. 14( 5):2608*
2. **Mesquita P L & M. Missimer. 2021. Social sustainability work in product development organizations: An empirical study of three Sweden-based companies. Sustainability. 13 (4):1986**
3. *Wälitalo, L. & M. Missimer. 2022. The Organization of Social Sustainability Work in Swedish Eco-Municipalities. Sustainability. 14(5):2770 (\*)*  
A survey among 21 municipalities and follow-up interviews with three of them were conducted.
4. *Mesquita P.L. & M. Missimer. 2020. "Supporting engineering students in analyzing social sustainability of a product: lessons learned" Presented at DESIGN 2020 Conference planned May 18-21, 2020, Dubrovnik, Croatia; rescheduled online September 2020 (\*)*

The aim of this study was to test a process created to help engineering students work systematically with social sustainability issues related to products.

**How does the developed process help students work with analyzing social sustainability impacts of a product?**

Test set-up - two different classes:

58 swedish students from 3 different engineering programs (Master of Science in Marine Technology, Master of Science in Mechanical Engineering and Master of Science in Industrial Management and Engineering  
15 international master's students in Structural Mechanics

# Papers + Methods

5.. Hudriksvall case study. Manuscript

6. Mesquita P L & M. Missimer. **A typology of approaches to social sustainability integration in product development organizations.** Manuscript

## Four dimensions

- The scope of the work and their view of interdependencies with other social systems
- Their definition of social sustainability and the issues they work with
- What guides strategic decisions
- How this internal work is structured

In-depth case study of 3 Organizations  
+  
insights from Sustainable Product Development and  
Corporate Sustainability literature  
=  
a typology of social sustainability approaches in product  
development organizations.

# Papers + Methods

7. Ayers, J., Missimer, M., & J. Bryant. 2023. Intrapersonal Capacities for Sustainability: A Change Agent Perspective on the 'Inner Dimension' of Sustainability Work. Accepted to Sustainability Science Jan 2023
8. Bryant, J., Ayers, J. and Missimer, M., 2023. What transforms?—Transformative learning in a sustainability leadership master's program. International Journal of Sustainability in Higher Education, 24(9), pp.231-251.
9. Bryant, J, Ayers, J. Missimer, M. & G. Broman. 2021. Transformational learning for sustainability leadership—essential components in synergy. International Journal of Sustainability in Higher Education. 22 (8): 190-207.
  - Alumni spanning 15 cohorts provided answers to a survey, and the responses were used to identify the outcomes of the program.
  - Of about 700 alumni at that time, 215 responded to the long survey, but not all answered the questions directly pertaining to this study, which left 156 survey responses to be examined by the researchers
10. Ayers, J., Missimer, M., & J. Bryant. 2020. "The Use of reflective pedagogies in sustainability leadership education—A case study". Sustainability.12(17): 6726