



DEVELOPMENT OF MOOC CONTENT ON SUSTAINABILITY COMPETENCIES

10.2.2025 14:00–15:00

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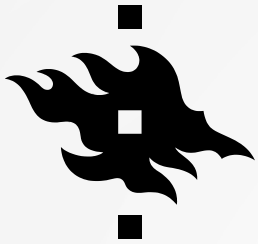
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HYPE
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08/02/2025



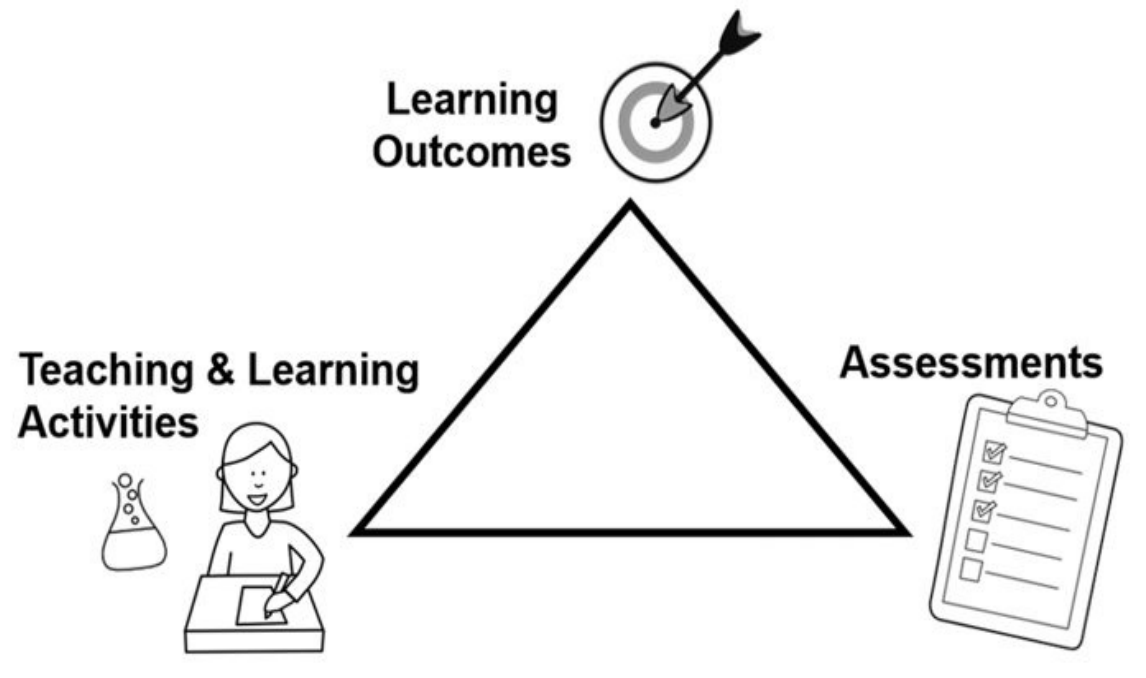
AGENDA

- Pedagogies matter: constructive alignment, student centered teaching, supportive learning environment, activation and motivation
- cMOOC versus xMOOC
- Scalability and interactivity
- What do we mean by sustainability?
- Strengthening sustainability competencies
- Case example: Development of MOOC content on sustainability competencies for the Sustainability Course at the University of Helsinki, Finland
- Questions and Answers



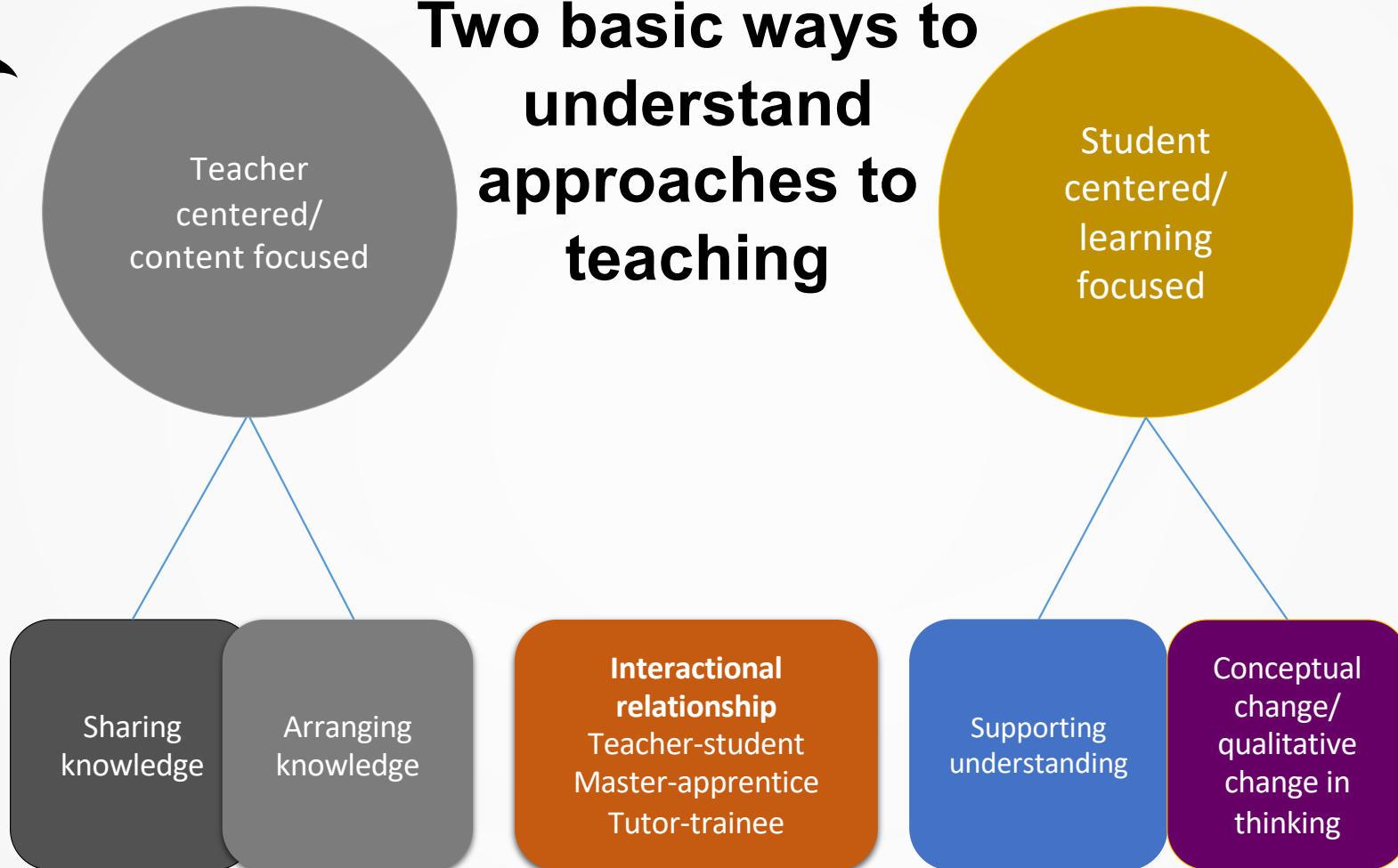
PEDAGOGIES MATTER: CONSTRUCTIVE ALIGNMENT

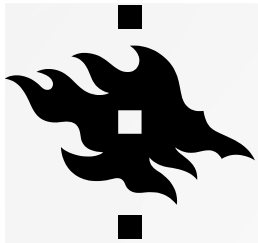
- Means that:
 - Intended learning outcomes
 - Learning activities
 - Assessment methods
- are aligned, support each other and support deep learning (Biggs & Tang, 2003)





Two basic ways to understand approaches to teaching



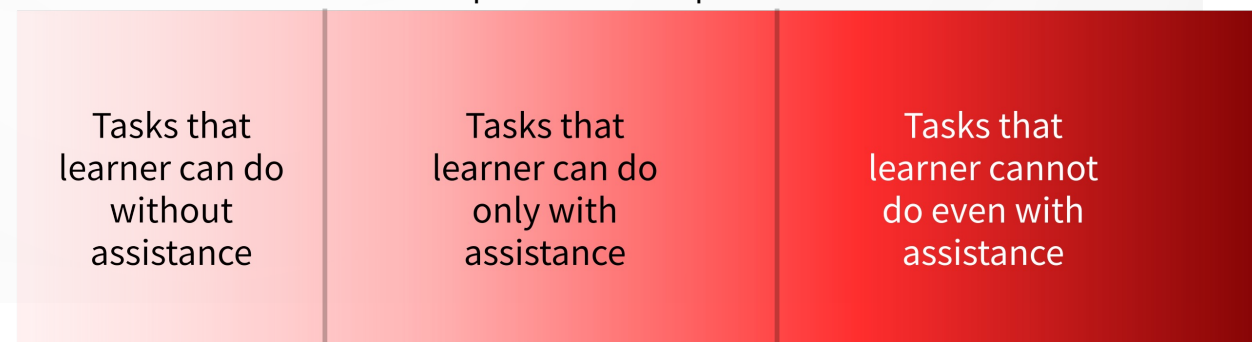


CREATING A SUPPORTIVE LEARNING ENVIRONMENT

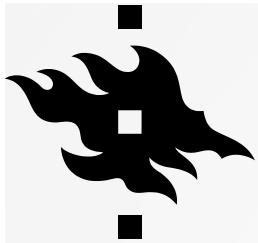


- **Zone of proximal development, ZPD** (Vygotsky, 1962)
 - Range where learners are capable only with support from someone with more knowledge or expertise.
- **Scaffolding** (Wood & Bruner & Ross 1976)
 - Support given to a student by a teacher throughout the learning process, gradually removed as students develop autonomous learning strategies.
 - e.g. (automated) support messages to those students who are stuck in some module in the Sustainability Course:
<https://moodle.helsinki.fi/mod/feedback/view.php?id=2947377>
Enrolment key: tfsasianelephant2022
- **Trust and open atmosphere**

<- Zone of proximal development ->



Increasing Task difficulty



SELF-DETERMINATION THEORY

(Deci & Ryan, 1985)

- **Intrinsic motivation:**

- makes learners to perform something for their personal interest
- learning something is rewarding or satisfying itself
- associated with curiosity, exploration, spontaneity and interest
- results in enjoyment of the process of increasing one's competency

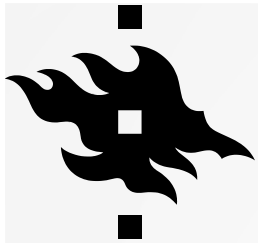
- **Extrinsic motivation:**

- makes learners to perform something to obtain a reward or avoid punishment.
- Extrinsic motivation can change to intrinsic motivation through interest and self-efficacy

- Intrinsic and extrinsic motivation can occur simultaneously!



- In a long run, **both are needed** in order to maintain motivation
- Extrinsic motivation might carry, if intrinsic motivation varies/decreases
- Extrinsic motivation is not enough in longer processes (e.g thesis process)
- Total lack of intrinsic motivation is detrimental for learning



HOW TO SUPPORT STUDENTS' INTRINSIC MOTIVATION?

Autonomy

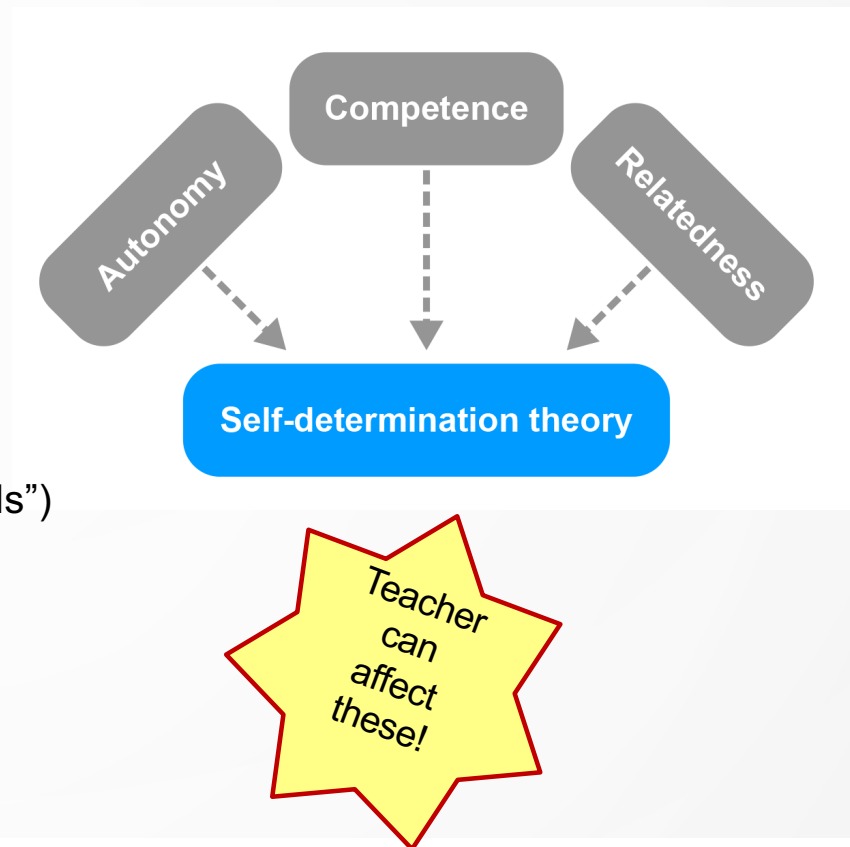
- sharing responsibilities and activities
- shared goals
- respecting the feelings and perceptions of others
- minimizing constant stress and control

Competence

- giving informative feedback and helpful advice
- positive challenges (appropriate level, "reachable goals")

Social support and relatedness

- feeling of being part of a group
- support from teacher and other students
- providing opportunities for interaction among students

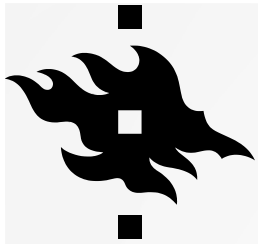




ACTIVATION IN DIFFERENT PHASES OF TEACHING SESSION

- **At the beginning:**
 - Questions which activate prior knowledge or orientate to the content
 - Students' own questions
 - Getting to know each other (or at least some other students)
- **In the middle:**
 - How the content has been understood?
 - Is the learning process going as planned?
- **At the end**
 - What did we learn?
 - What should we still learn?
 - How to apply the learnt knowledge?

**CONSTRUCTIVE
ALIGNMENT:** teaching
is not only about
delivering knowledge
but **supporting
students' active
construction of
knowledge**



THE BASIC PRINCIPLES OF ACTIVATING TEACHING

■ Activate and diagnose

- Ask what students think and know before teaching the theme
- Use questions
- Support and facilitate students' responsibility of their own learning since the beginning of the course

■ Support students' learning process

- Discuss the learning goals
- Construct instructional support – scaffolding
- Explicate thought processes and conceptions – open them for discussion

■ Give feedback and make peer feedback possible during the learning process and after it

- Give feedback about the strengths and areas of development
- Clarify the assessment criteria in the beginning of the course

(Lonka & Lonka, 1991; Hakkarainen et al., 2004)



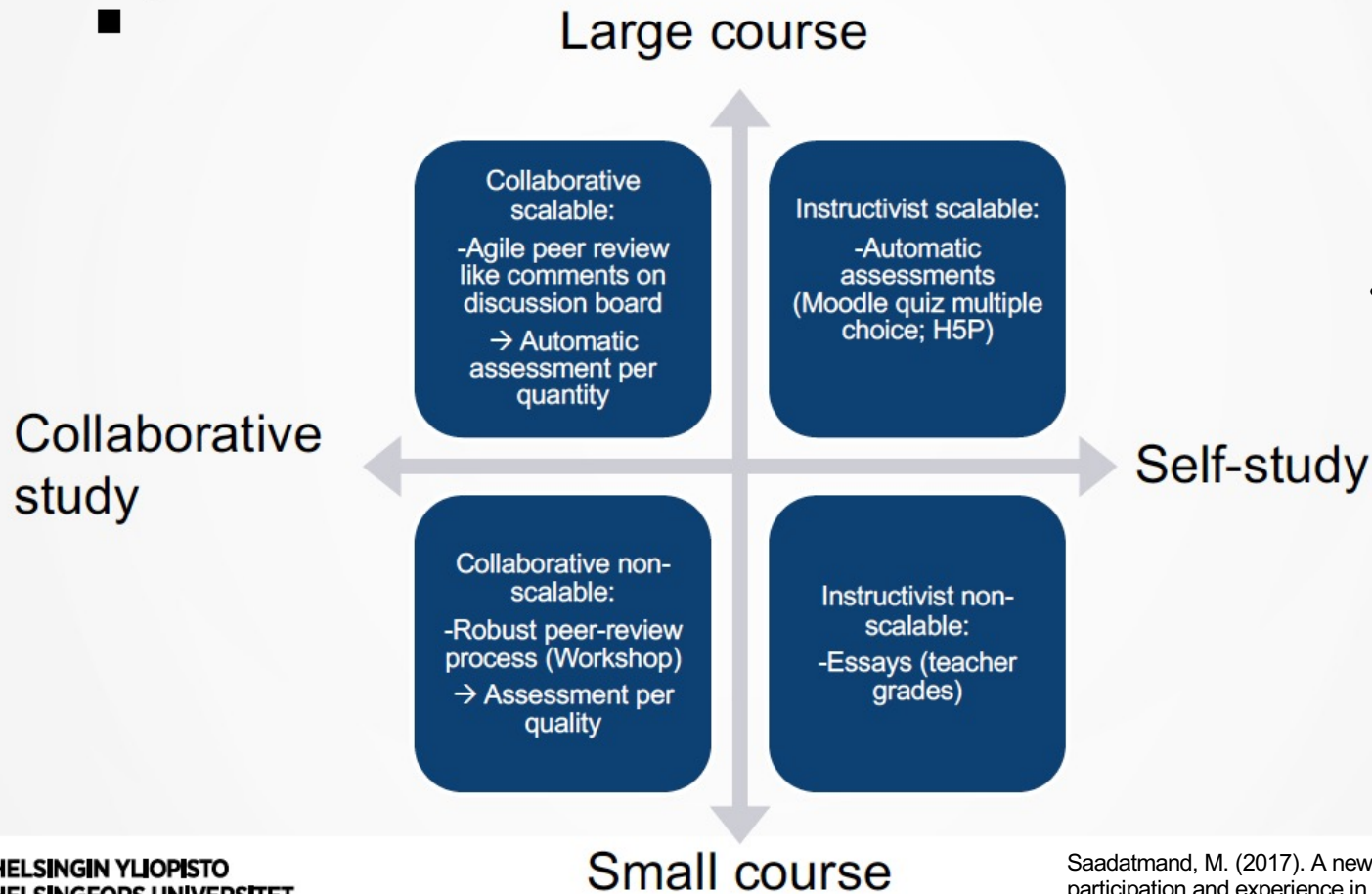
CMOOC OR XMOOC?

- MOOC environments can be divided into cMOOCs (connectivist MOOCs) emphasising student interaction and communication, and xMOOCs (instructivist MOOCs) focusing on teacher-centred knowledge transfer.
- In cMOOCs, learners use networked platforms (e.g., blogs, wikis, shared documents, social media or Moodle) to produce and share knowledge. In xMOOCs, knowledge is produced on a structured course platform with limited interaction.

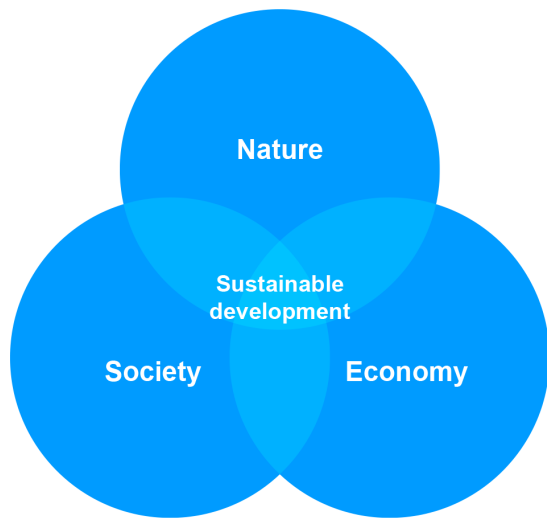
	cMOOC	xMOOC
Learner role	Active	Passive
Teacher role	Facilitator or co-learner	Knowledge sharer (on video) or supervisor
Learning theories	Connectivism or socio-constructivism	Behaviourism or cognitivism
Pedagogical premise	Building knowledge	Repeating knowledge
Platforms	Personal learning environments (PLE)	Learning management systems (LMS)
Assessment	Self-assessment or peer assessment	Automated (multiple-choice examinations) or teacher-led assessment
Certificate	Rarely	Often
Business model	Non-commercial	Commercial



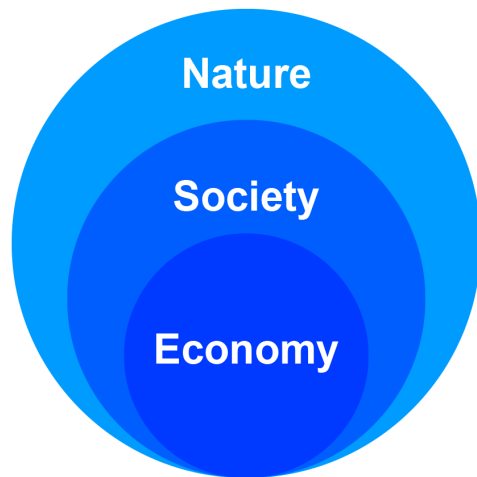
SCALABILITY AND INTERACTIVITY



- Online courses have been classified based on their scalability (large – small) and how they support collaborative and social learning activities (collaborative vs self study) (Saadatmand 2017)
- For the University of Helsinki Sustainability Course, we aimed to design collaborative ways to study and work in groups that could be scaled up for a large number of students, but there are also many automated learning activities that students can self-study (e.g. quick games and multiple-choice quizzes)



Weak sustainability



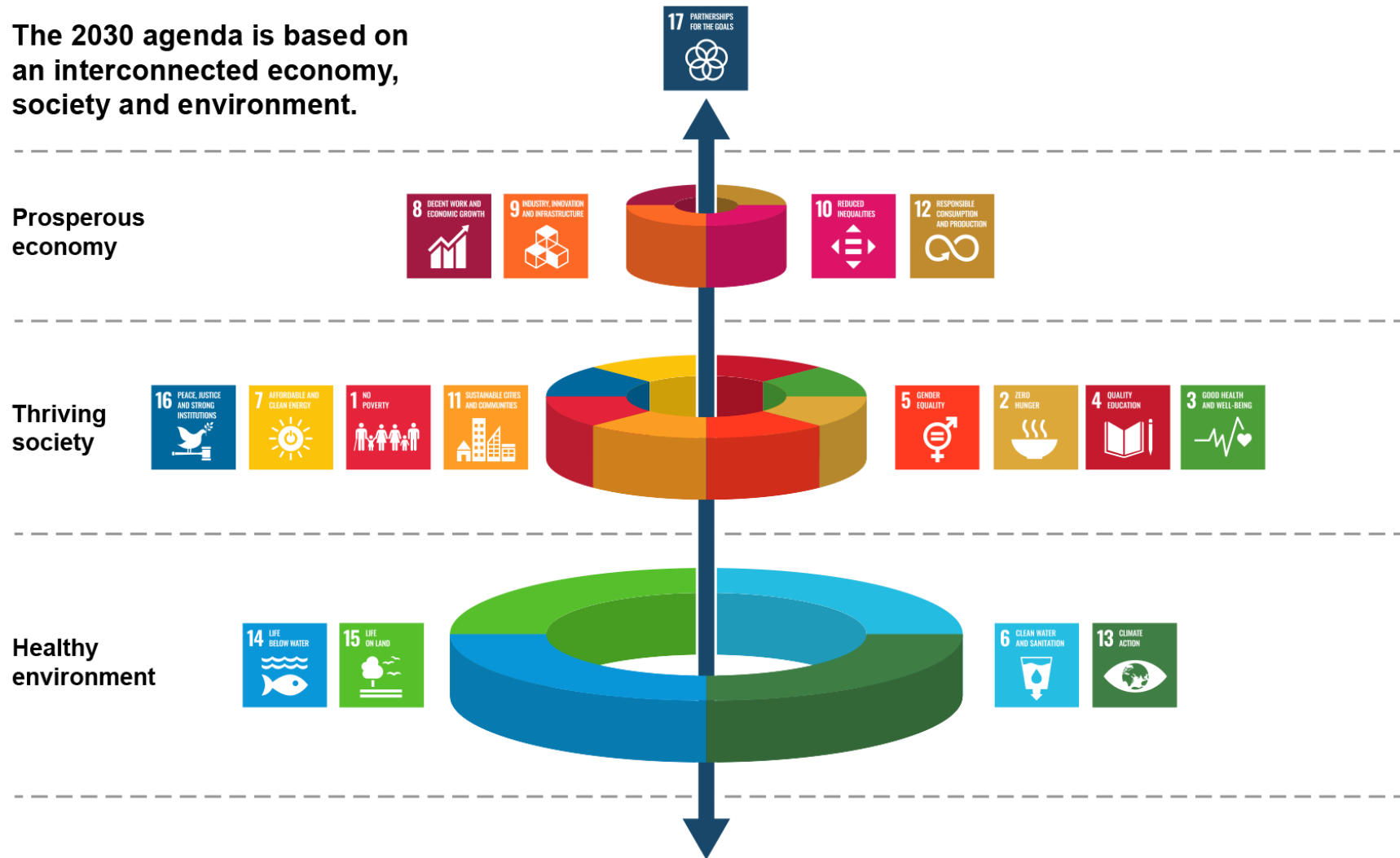
Strong sustainability

WEAK OR STRONG SUSTAINABILITY?

- Weak sustainability presents the environmental, social, and economic themes with equal weighting and seeks to balance them. “Human capital” can substitute “natural capital”.
 - *E.g. Sustainability is development that “meets the needs of the present without compromising the ability of future generations to meet their own needs (UN 1987)”*
- Strong sustainability, with focus on systems, presents the three themes as nested and confers different sizes and weighting to them. “Human capital” and “natural capital” are not interchangeable. Planetary boundaries set objective limiting factors for human flourishing.
 - *E.g. Sustainability refers to the wellbeing and existence of human communities and other species within the earth’s biosphere capacity (Folke et al, 2016)*

Weak sustainability: Brundtland 1987; Strong sustainability: Giddings 2002

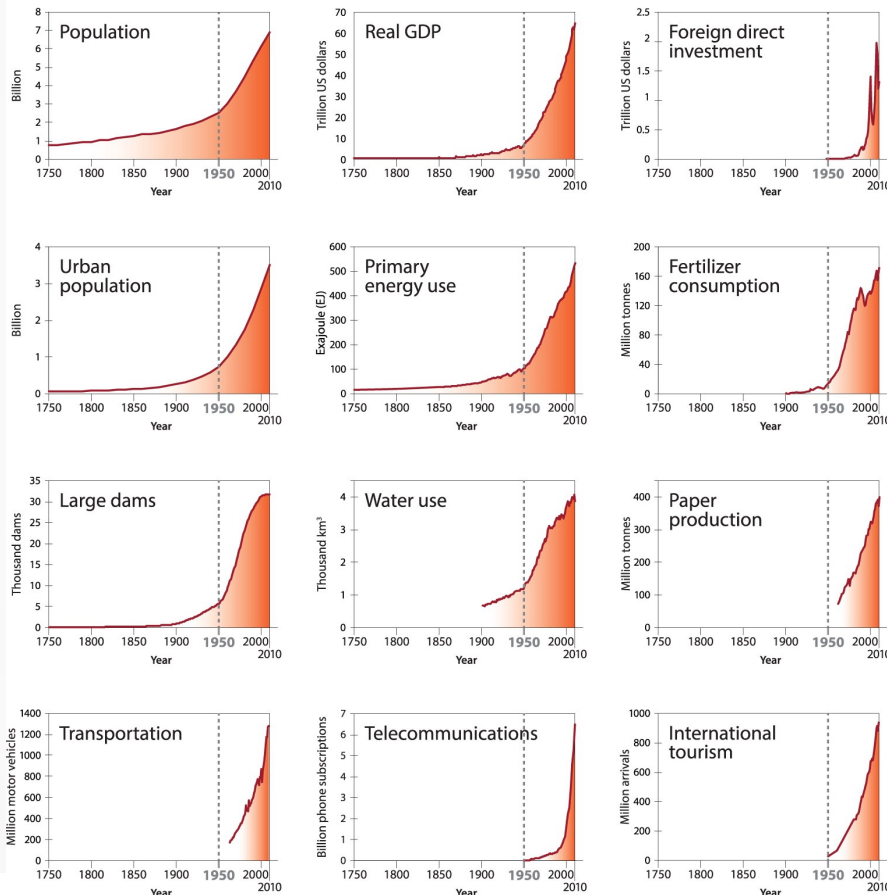
The 2030 agenda is based on an interconnected economy, society and environment.



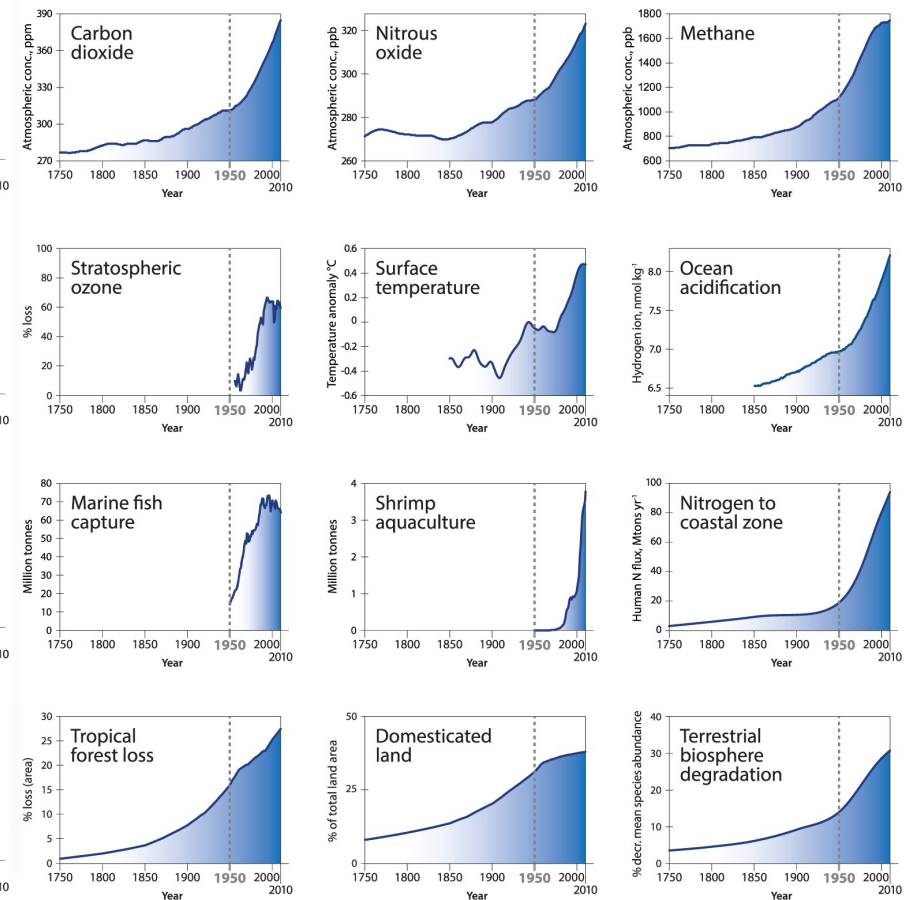
Sustainable development goals and strong sustainability approach. Redrawn from Rockstrom and Sukhdev (Azote Images for Stockholm Resilience Centre, 2016). Ecological sustainability is the foundation on which sustainability is built.

THE GREAT ACCELERATION CHALLENGES ECOLOGICAL SUSTAINABILITY (STEFFEN ET AL. 2015)

Socio-economic trends



Earth system trends



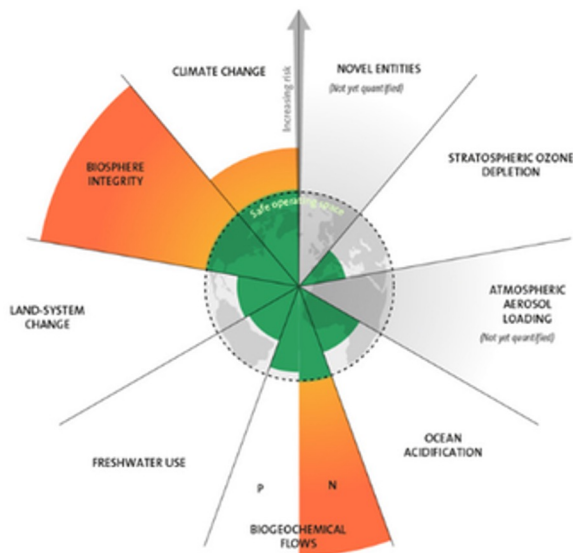
- Acceleration of human economic activities after 1950s.
- The economy was organized in a new way as the liberal market economy pursued by the winning states of 2nd world war spread wider and economic organizing models that emphasized self-sufficiency became rare.
- → Need for conceptual change in sustainability education

Steffen, W., Broadgate, W., Deutsch, L., Gaffney, O., & Ludwig, C. (2015). The trajectory of the Anthropocene: The Great Acceleration. *The Anthropocene Review*, 2(1), 81-98. <https://doi.org/10.1177/2053019614564785>

IN JUST OVER A DECADE, THE SITUATION HAS ONLY WORSENE

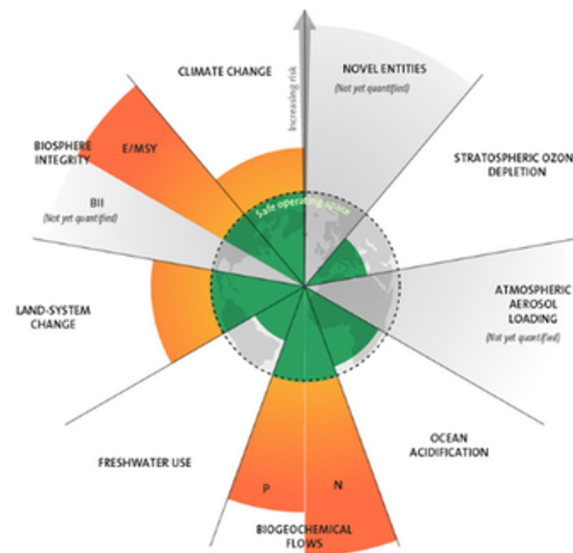


2009



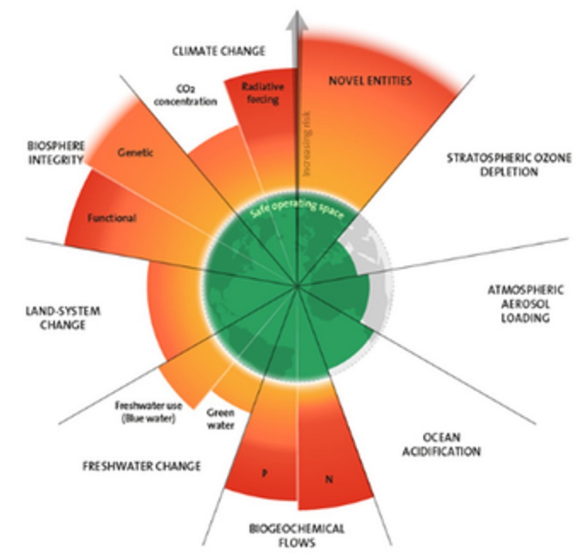
7 boundaries assessed,
3 crossed

2015



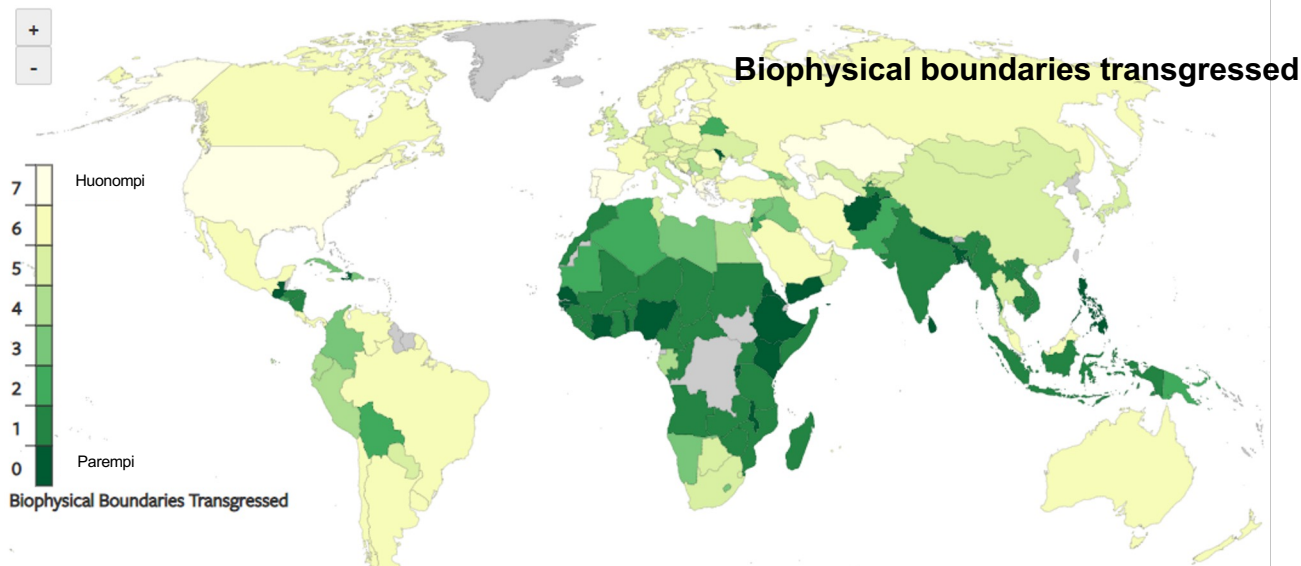
7 boundaries assessed,
4 crossed

2023



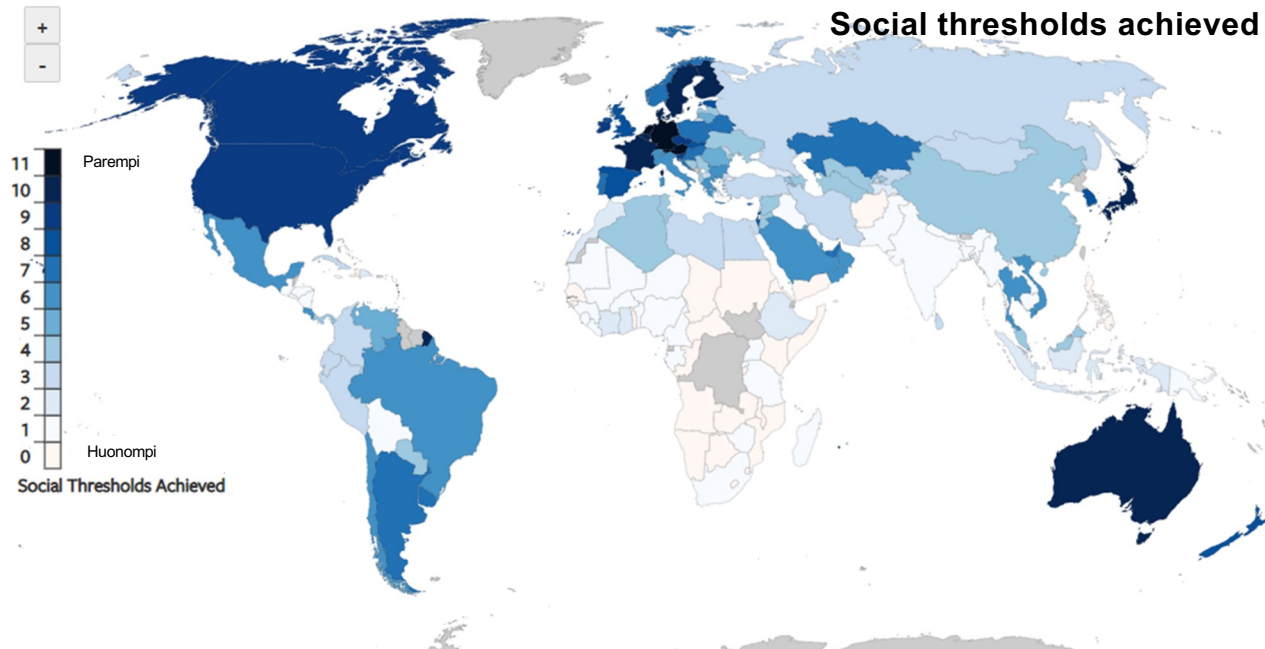
9 boundaries assessed,
6 crossed

The evolution of the planetary boundaries framework. Licenced under CC BY-NC-ND 3.0 (Credit: Azote for Stockholm Resilience Centre, Stockholm University. Based on Richardson et al. 2023, Steffen et al. 2015, and Rockström et al. 2009)



BIOPHYSICAL BOUNDARIES:
CO2 emissions
Phosphorus
Nitrogen
Blue water
eHANPP
Ecological footprint
Material footprint

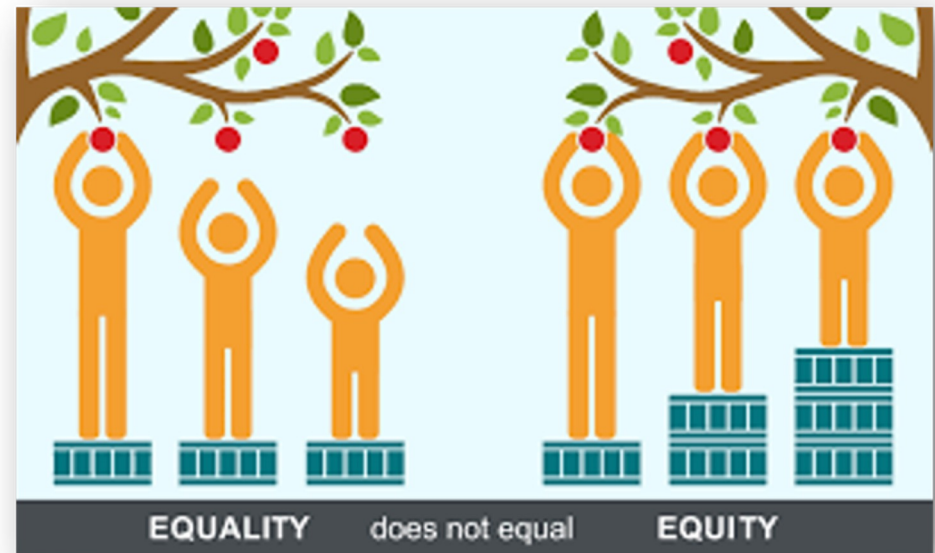
O'Neill et al. 2018
<https://goodlife.leeds.ac.uk>



SOCIAL THRESHOLDS
Life satisfaction
Healthy life expectancy
Nutrition
Sanitation
Income
Access to energy
Education
Social support
Democratic quality
Equality
Employment

SOCIAL SUSTAINABILITY MEANS INCLUSIVE SOCIETY AND WELFARE FOR ALL

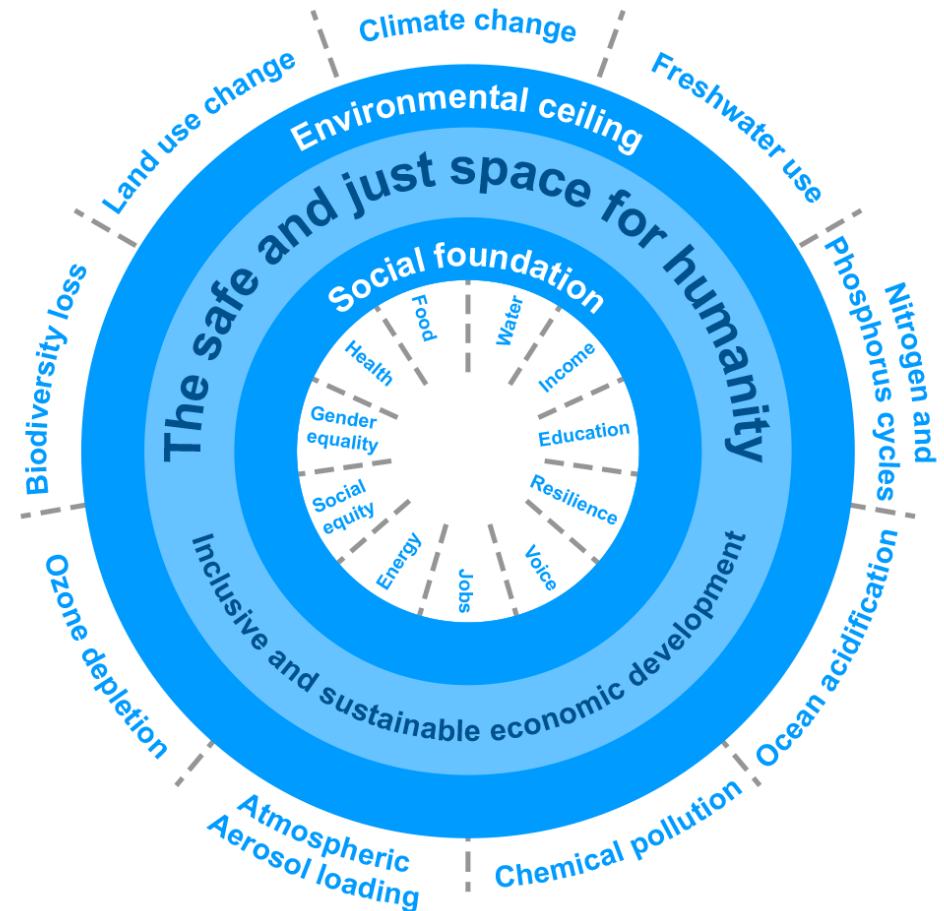
- Social sustainability is more difficult to define or measure than ecological sustainability. Definitions and priorities have changed over the last few decades.
- For example, there has been a shift from 'hard' (and often problematic) indicators of well-being, such as GDP, to 'soft' ones, such as the happiness index (Colantonio 2012)
- The debate on social sustainability, especially in the context of environmental philosophy and post-humanist research, has broadened from **human rights to the rights of animals, plants and various entities.**



ECONOMIC SUSTAINABILITY

- **Temporal** distribution: overgenerational justice
- **Spatial** distribution: the local, national and global distribution of justice and fairness.
- The global economic system, with its separation of production and consumption, has hidden many problems and inequalities from our view.
- **Economic sustainability is in conflict with ecological sustainability** if the overconsumption of the Global North is not reduced at the same time as basic rights are guaranteed to those who consume the least.
- Raworth 2012: Doughnut economics

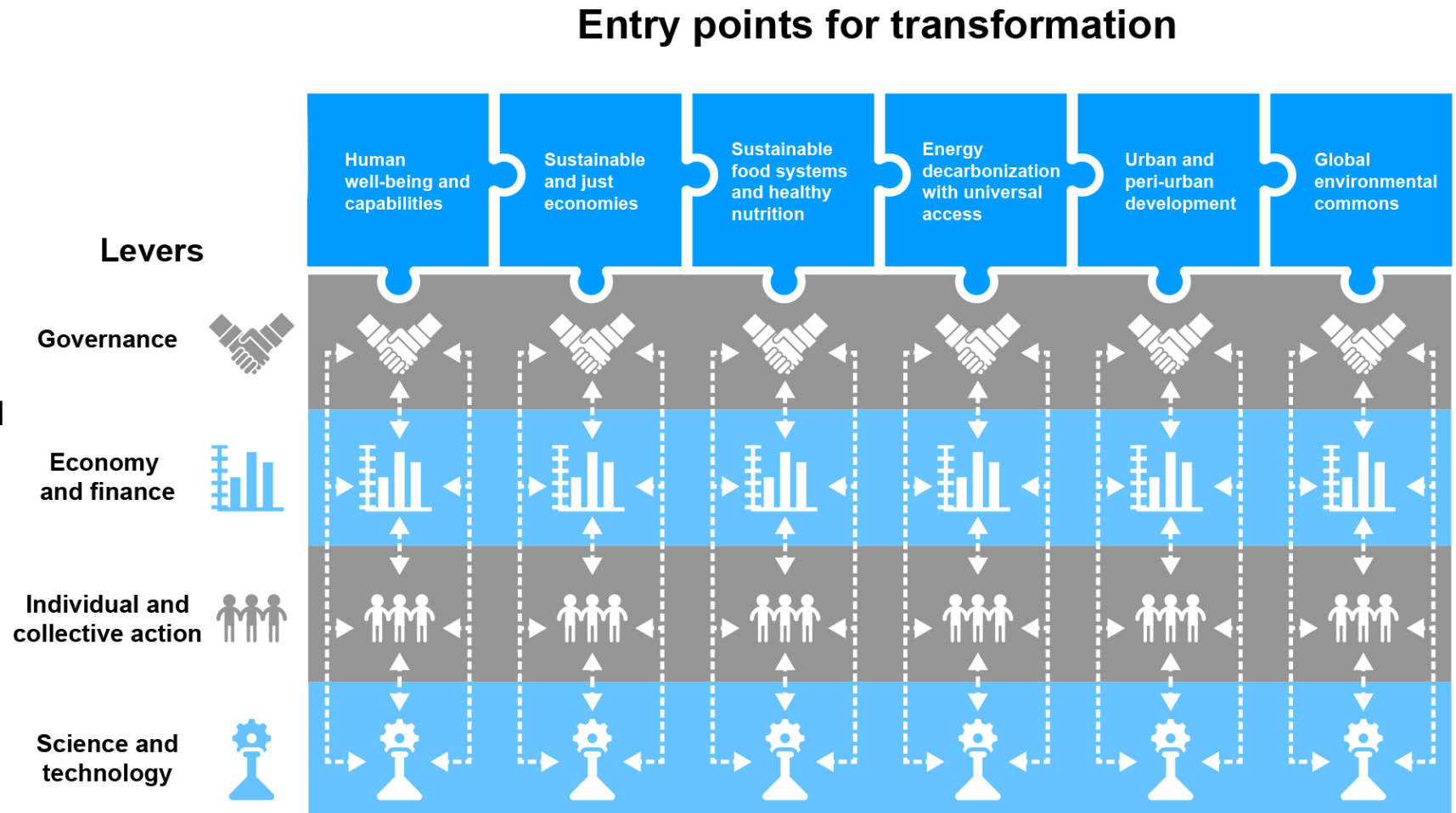
Can we live inside the doughnut?
Why we need planetary and social boundaries.



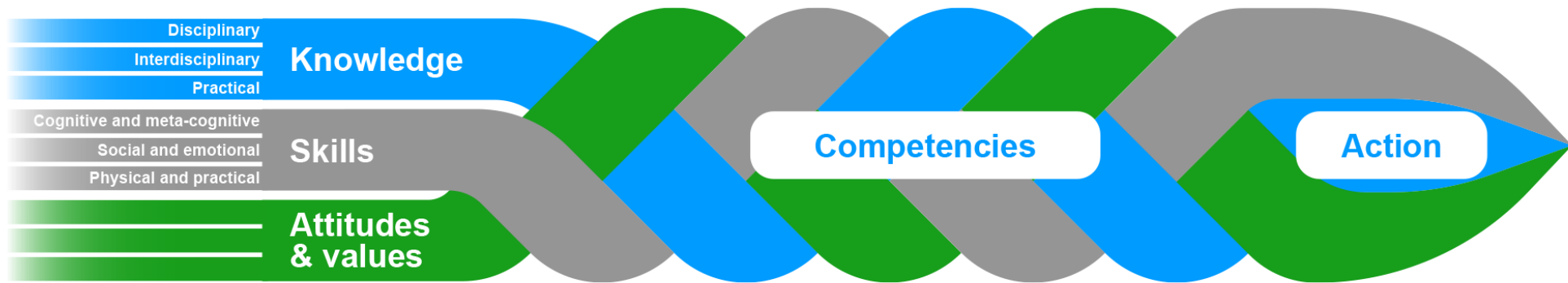
Doughnut economics model. Redrawn from Raworth, K. (2017) Doughnut economics: seven ways to think like a 21st-century economist.

According to United Nations (2019), we need changes in six entry points (systems) to advance sustainability transformation:

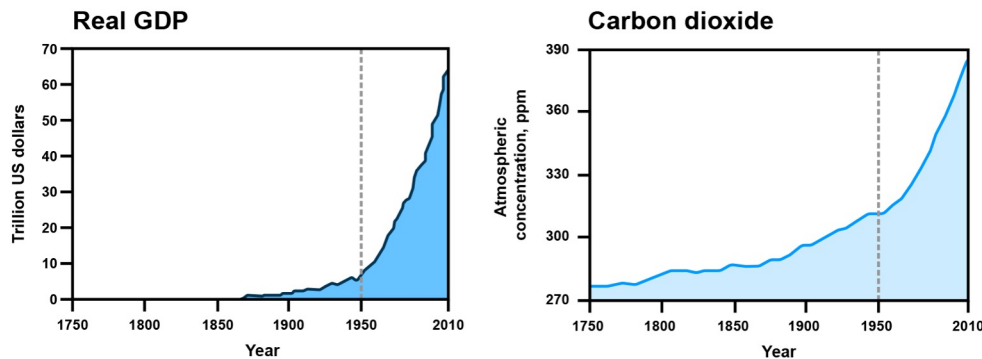
Human well-being and capabilities, Sustainable and just economies, Sustainable food systems and healthy nutrition, Energy decarbonization with universal access, Urban and peri-urban development and Global environmental commons



Entry points of transformation towards a more sustainable society, identified by the United Nations, Independent Group of Scientists appointed by the Secretary-General (2019). Global Sustainable Development Report 2019: The Future is Now – Science for Achieving Sustainable Development, United Nations, New York.
<https://sustainabledevelopment.un.org/gsdr2019>



Education 2030 Framework by OECD. Redrawn from [Auld & Morris 2019](#).



E.g. No empirical evidence on decoupling accelerating economic growth from resource consumption or greenhouse gas emissions fast enough (e.g. Saito 2024, Vogel & Hickel 2023, Vaden et al. 2020, Vaden et al. 2019).

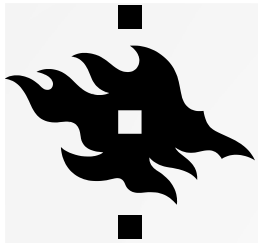
What are the intended learning outcomes?

- Sustainability knowledge
- Sustainability skills
- How can teaching strengthen students' capabilities to reflect old conceptions of sustainability, construct new understanding and have the courage to challenge dominant unsustainable discourses, lifestyles, and values?

Key competencies in Sustainability in Higher Education	Lozano et al. 2017	Brundiers et al. 2020	Wiek et al. 2011
Systems thinking / Systems-thinking competency	X	X	X
Futures thinking competency / Anticipatory thinking	X	X	X
Values-thinking competency / Justice, responsibility, ethics / Normative competency	X	X	X
Interpersonal relations and collaboration / Interpersonal competency	X	X	X
Strategic action / Strategic-thinking competency / Strategic Competency	X	X	X
Interdisciplinary work	X		
Critical thinking and analysis	X		
Empathy and change of perspective	X		
Communication and use of media	X		
Personal involvement	X		
Assessment and evaluation	X		
Tolerance for ambiguity and uncertainty	X		
Integrated Problem-Solving competency		X	
Implementation Competency		X	
Intrapersonal Competency / Mindset		X	

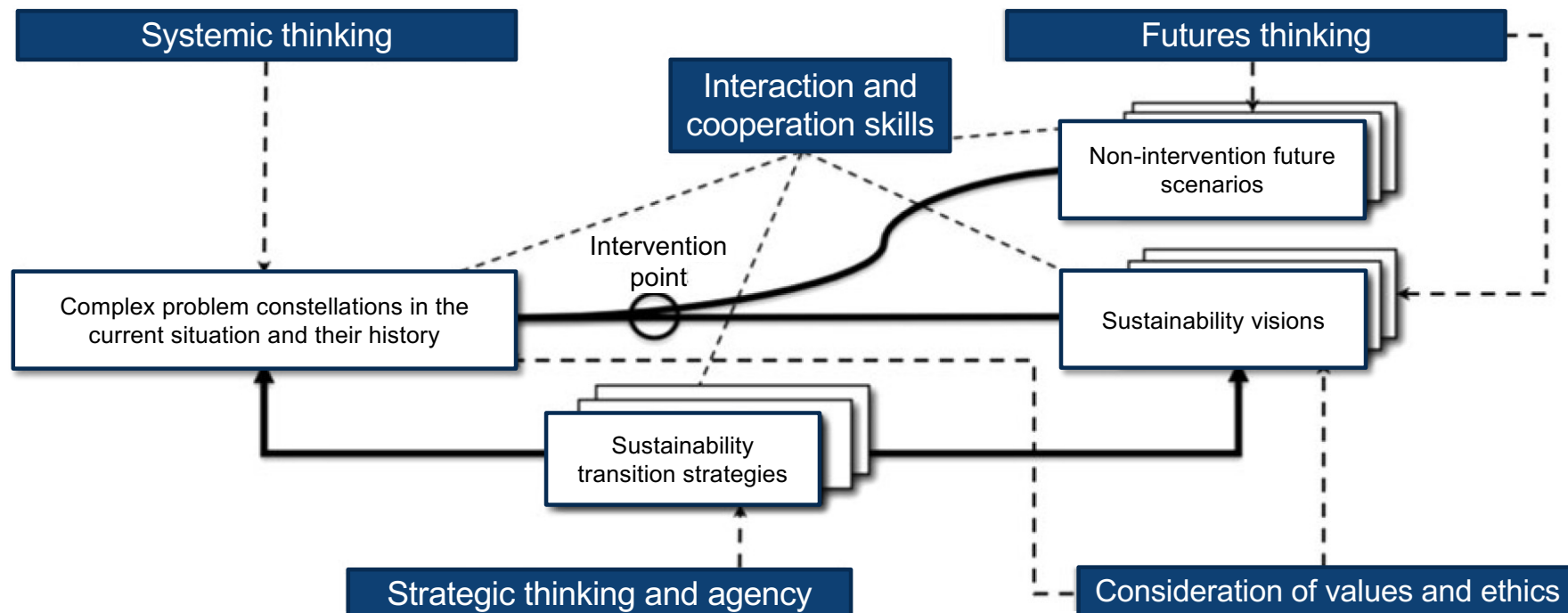
STRENGTHENING SUSTAINABILITY COMPETENCIES IN HIGHER EDUCATION

- Different frameworks for the key sustainability competencies have been presented in the literature. The most commonly identified key competencies are:
 - Systems thinking
 - Futures thinking
 - Values thinking
 - Interaction and cooperation
 - Strategic thinking and agency
- Other generic academic skills (e.g. critical thinking, identification and direction of personal expertise, communication and scholarly thinking) are also important in addressing sustainability issues and support sustainability competences



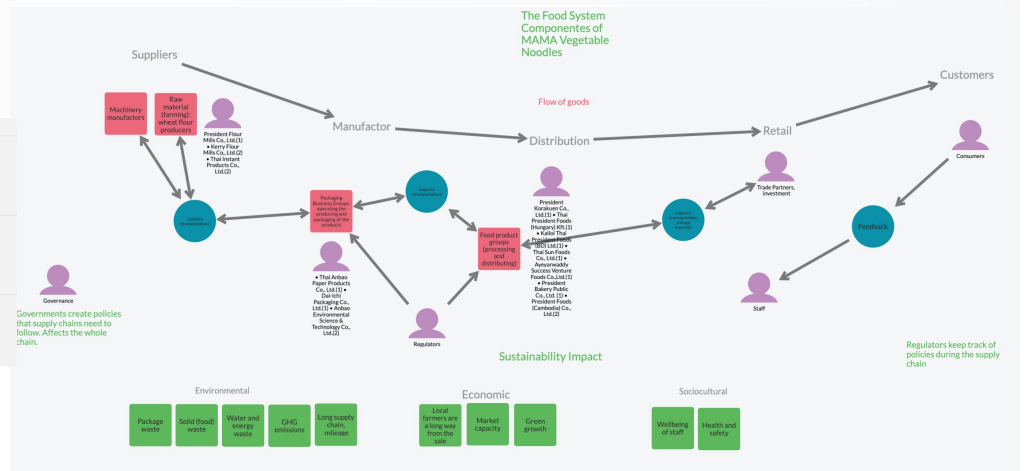
HOW SUSTAINABILITY SKILLS ARE LINKED TO SOLVING SUSTAINABILITY CHALLENGES, SUCH AS BIODIVERSITY CRISIS, CLIMATE CHANGE OR GLOBAL INEQUALITY?

Example of a problem-solving framework for the sustainability challenges (Wiek et al. 2011)



Skill or competence (Wiek et al. 2011; Lozano et al. 2017; Brundiers et al. 2020)	Examples of key concepts and methods (Wiek et al. 2011)	Examples of learning outcomes (Wiek et al. 2016)	Examples of teaching methods (Lozano et al. 2017)
Systemic thinking Understanding and analysing the structures and dynamics of complex systems (e.g., natural, societal, economic and cultural systems)	Variables/indicators, sub-systems, structures, feedback loops, causalities, tipping points, scales (e.g., local and global), dimensions of sustainability, systems and their interconnections (e.g., natural, societal, economic, cultural and technological systems), human and societal activity (e.g., values, attitudes, preferences, action, power, politics, laws and institutions), qualitative and quantitative models, analysis of social systems, combination of different dataset types and methods, simulations	<ul style="list-style-type: none"> - Ability to describe the sustainability problem from a range of perspectives and on different scales - Ability to analyse the structure, dynamics and other features of complex systems to solve a problem - Ability to identify various mechanisms of action to solve a (sustainability) problem - Ability to simulate and assess various alternative developments 	Case-based teaching (case studies), mind and concept maps, project-based learning, problem-based learning, life cycle analysis, analysis of supply or value chains, projects with local operators, field instruction, place-based learning

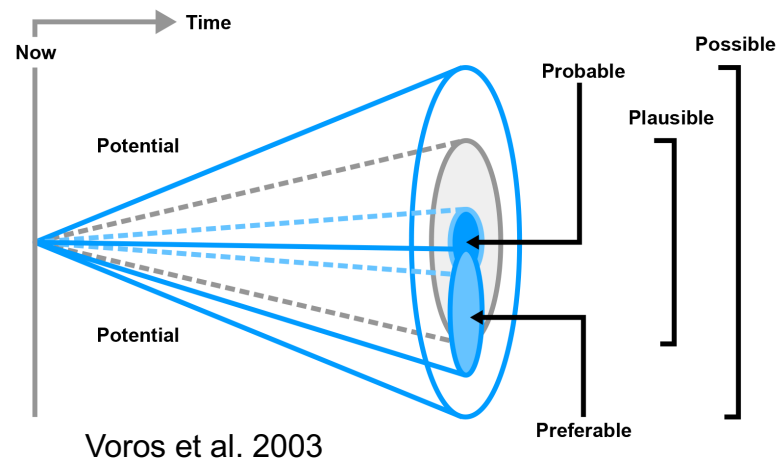
Example (Sustainability Course): The students draw an actorsmap of one food product as part of food system



Skill or competence (Wiek et al. 2011; Lozano et al. 2017; Brundiers et al. 2020)	Examples of key concepts and methods (Wiek et al. 2011)	Examples of learning outcomes (Wiek et al. 2016)	Examples of teaching methods (Lozano et al. 2017)
Futures thinking Assessing, analysing and constructing future images and scenarios to identify challenges and solutions	Temporal concepts (past, present, future), periods of time (short, long), dynamics, path dependence, uncertainty and probability, developments, inertia, risk analyses, the precautionary principle, anticipation, scenarios, visions, modelling, assessment of scenarios, the Delphi method	<ul style="list-style-type: none"> - Ability to describe and examine various future scenarios and visions for a desirable future - Ability to apply futures thinking to anticipate the potential effects of measures and to compare them with alternative future scenarios - Ability to describe and examine future scenarios relevant to the student's discipline 	Case-based teaching (case studies), project-based learning, problem-based learning, participatory action research, life cycle analysis, analysis of supply or value chains, practical projects with local communities

Example (Sustainability Course): Students develop scenarios for possible, plausible, probable and preferable futures using future cone framework.

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Voros et al. 2003

Future cone question a) What are the POSSIBLE effects of climate change on human activities?

36 responses

Päättäjien ilmastomuutokseen, ympäristöön ja kiertotalouteen vaikuttavien asioiden preferointi päätöksenteossa.

No policies are achieved to mitigate climate change. Large areas of the planet turn uninhabitable for humans, and society as we know it starts to collapse.

New conflicts related to inequality between some countries/groups will still exist, which might lead to more wars.

As a result of climate change, coastal areas may experience erosion and damage. Migration and urban development could be impacted as well.

Production of food crops can be disturbed due to climate change (because of droughts, floods etc.). In poor countries, this can lead to an increased hunger problem.

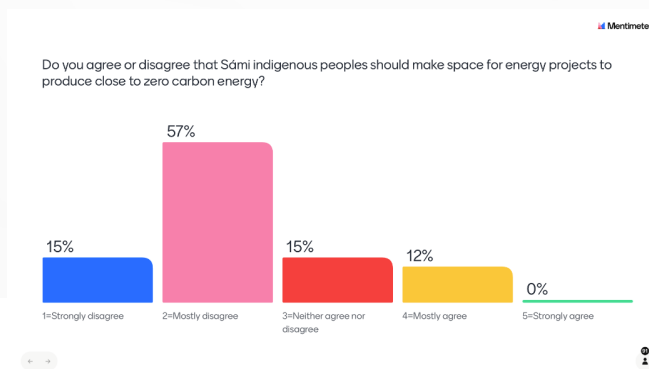
More and more animals will be placed to live, and more and more restriction will be imposed to protect the environment.

ecological destruction that threatens

Voi vaikuttaa maanviljelyyn äärisäillä

Skill or competence (Wiek et al. 2011; Lozano et al. 2017; Brundiers et al. 2020)	Examples of key concepts and methods (Wiek et al. 2011)	Examples of learning outcomes (Wiek et al. 2016)	Examples of teaching methods (Lozano et al. 2017)
Consideration of values and ethics / Values thinking <ul style="list-style-type: none"> Defining and negotiating sustainable and responsible values, principles, objectives and goals together with others. 	Principles and goals of sustainable development, tipping points, global and intergenerational justice, responsibility, fairness, security, happiness, planetary boundaries, risks, ethics, the responsibility of individuals for their actions as well as the ethics and sustainability of personal and professional activities, risk analysis, participatory planning, traditional ecological knowledge	<ul style="list-style-type: none"> - Ability to consider values, principles and goals associated with sustainability and responsibility in assessing actions and envisioning the future - Ability to consider values, principles and goals associated with sustainability and responsibility in solving complex sustainability problems and to identify related differences in the actions of different parties 	Practical projects with local communities, participatory methods, case-based teaching (case studies), project-based learning, problem-based learning, collaborative learning, field instruction

Example (Sustainability Course): Students reflect on building wind power on sacred indigenous land (case study assignment, including a video, case study description text, poll, open ended question)



Please justify your choice briefly

54 responses

The windmills should be built somewhere where they don't disrupt the local way of life as much, and in every case financial side should be transparent to locals

Perhaps not as many windmills should be built in the north. Compromises are inevitable in energy questions, but if possible, the mills should be located elsewhere.

Abandon the colonialist thinking that we could build our power plants on someone else's land. Build the wind mills into the city skyline. Invest in solar energy and use it on roof tops.

The conceptualization of the Swedish (or whichever national government) being responsible for decisions on Sami land is wrong to begin with. The decisions on that land do not belong to anyone else

Mielestäni pitäisi ottaa huomioon myös alueen ihmisten mielipiteet ja heidän elämänsä. Olisi hyvä etsiä tuulimyllyille joku muu paikka.

Secure enough space for reindeers without harming them. I consider that Indigenous people have a right to decide, so most suitable measures for them should be taken.

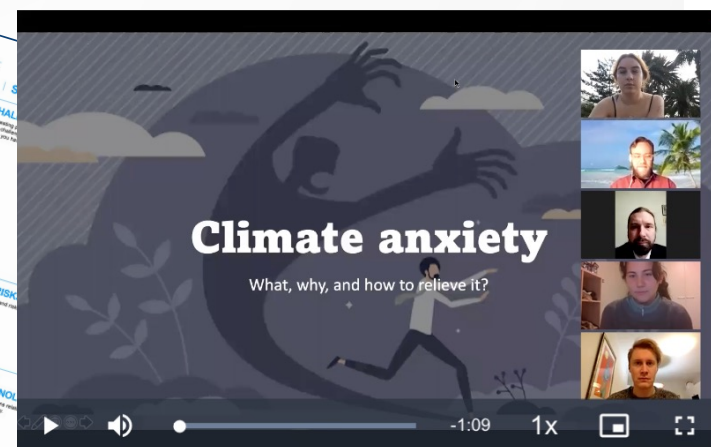
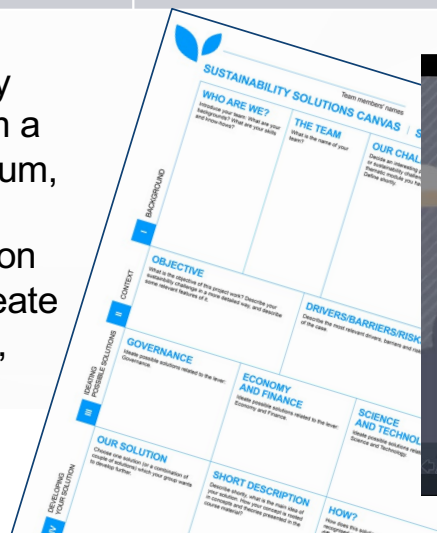
Mietin, että mihin perustasi tuo sijainti?

Skill or competence (Wiek et al. 2011; Lozano et al. 2017; Brundiers et al. 2020)	Examples of key concepts and methods (Wiek et al. 2011)	Examples of learning outcomes (Wiek et al. 2016)	Examples of teaching methods (Lozano et al. 2017)
Strategic thinking and agency/action Planning and implementing experiments, interventions, transitions or change that supports sustainability	Sustainability transitions, the sustainability transformation, strategies, action plans, interventions, cooperative governance, success factors, feasibility, impact, adaptation to and prevention of global problems, obstacles to and drivers of action, societal movements and activism, planning of management, policy recommendations, information support for decision-making, teaching and learning, management and planning of change	<ul style="list-style-type: none"> - Ability to plan, assess and carry out interventions, transitions and change that support sustainability - Ability to apply a range of methods related to project management as well as plan, carry out and manage project-based work - Ability to work with different stakeholders 	Challenge-based learning, project-based learning, problem-based learning, collaborative learning, interdisciplinary group instruction, participatory action research

Typical prerequisites for teaching (Aalto 2018):

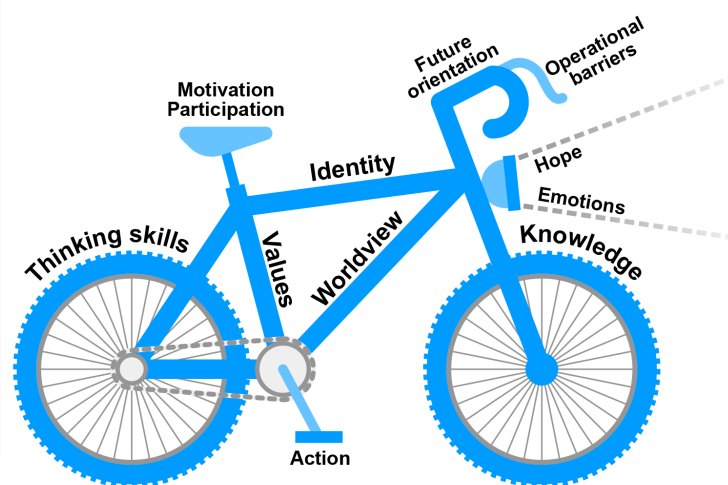
- Action and solution-centredness
- Concrete, visible impacts
- Collaboration and collective action
- Inclusion
- Strengthening critical thinking
- Emotional education

Example (Sustainability Course): Students form a group in discussion forum, create a sustainability transformation project on powerpoint canvas, create an elevator pitch video, submit the project on discussion forum and give peer feedback



Skill or competence (Wiek et al. 2011; Lozano et al. 2017; Brundiers et al. 2020)	Examples of key concepts and methods (Wiek et al. 2011)	Examples of learning outcomes (Wiek et al. 2016)	Examples of teaching methods (Lozano et al. 2017)
Interaction and cooperation skills <ul style="list-style-type: none"> Understanding, assessing and reconciling different opinions, viewpoints and starting points 	Forms, methods and dynamics of collaboration (interdisciplinarity, transdisciplinarity), management and leadership, working in a group, cooperative development of knowledge, switching viewpoints, participatory methods, negotiation, mediation, discussion, constructive conflict resolution	<ul style="list-style-type: none"> - Ability to work and collaborate with people from different fields and with various stakeholders - Ability to apply a range of interactive and participatory methods in the group's planning activities - Ability to work empathically and compassionately with a range of individuals 	Collaborative learning, problem-based learning, project-based learning, interdisciplinary group instruction, group discussion (e.g., supervising a dialogue based on the Timeout method)

Example (Sustainability Course): analyzing your own strenghts and weaknesses, practicing empathic interaction in online discussion in a discussion forum.



Bicycle model for climate change education (Cantell et al. 2019)

Dashboard / My courses / SUST001spring25 / 2. SOLUTIONS to sustainability challenges / MODULE 2, MANDATORY ASSIGNMENT 2: Your sustainability expertise

FORUM
MODULE 2, MANDATORY ASSIGNMENT 2: Your sustainability expertise

Forum Don't track unread posts

Back to course

To do: Start discussions: 1 To do: Post replies: 1 To do: Make forum posts: 2

Please begin the assignment by reading the "Book 1: My own role as an individual and expert" in the Module "Solutions to sustainability challenges".

In this Assignment you will write two posts. First you will add a new discussion, and after that answer to other student's discussion. Let's start!

1. After reading this book, what do you think about your own expertise regarding the solving of sustainability challenges:

- What are your own strenghts?
- What are your own weaknesses?

Utilize this bicycle-metaphor (see image below) by Cantell et al. (2019) to aid in constructing your comment.

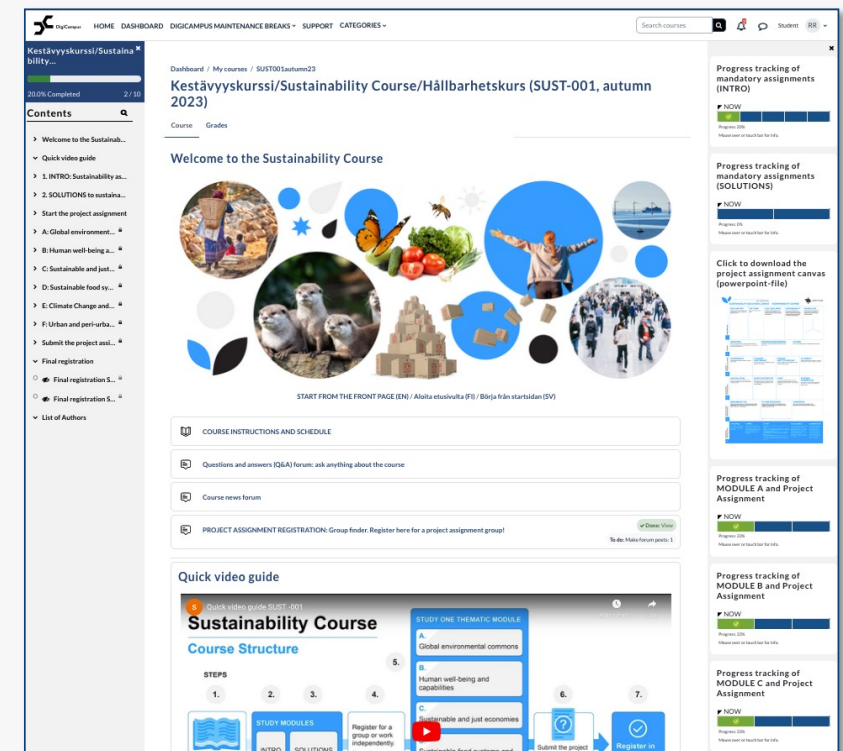
2. After writing your own comment, write an encouraging comment to at least one other student who has not received a comment yet. Remember to express empathy in your response!

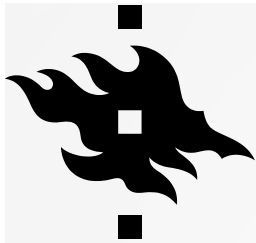


SUSTAINABILITY COURSE (SUST-001) AT THE UNIVERSITY OF HELSINKI, FINLAND

BACKGROUND

- New strategic plan: The theme of sustainability is to run through all of the University's educational offerings. This means making sustainability expertise part of discipline-specific knowledge and skills as well as generic expert skills
- A new multidisciplinary Sustainability Course for all students of the University of Helsinki (and everyone via Open University)
- Co-developed with 160+ members of the university community (students, teachers, researchers & other staff) from all faculties in semester 2020–2021
- Online-course, 3 ECTS common part (open now) + 2 ECTS discipline-specific parts (in development), bachelor level course
- Asynchronous, Moodle-based course
- Multilingual, currently in English, Finnish and Swedish
- ~500 students / academic period → ~2000 students / year





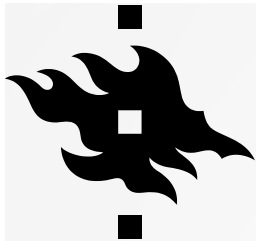
RESEARCH-BASED DEVELOPMENT OF THE COURSE

	Humanities (<i>n</i> = 153) Mean (SD)	Social sciences (<i>n</i> = 267) Mean (SD)	Science (<i>n</i> = 193) Mean (SD)	Agriculture (<i>n</i> = 108) Mean (SD)	Health and welfare (<i>n</i> = 60) Mean (SD)	<i>F</i>
<i>Sustainability competencies</i>						
Critical thinking	6.12 (0.82)	6.10 (0.78)	6.03 (0.73)	6.07 (0.85)	5.90 (0.91)	1.00
Values thinking	5.72 (1.13)	5.70 (1.19)	5.63 (1.28)	5.79 (1.23)	4.77 (1.57)	7.90***
Interpersonal competence	5.21 (1.07)	5.35 (1.10)	5.09 (1.18)	5.29 (1.13)	5.08 (1.32)	1.76
Self-regulation	5.56 (1.13)	5.57 (1.08)	5.37 (1.12)	5.47 (1.20)	5.47 (1.06)	0.96
Collaborative use of digital technology	4.46 (1.37)	4.81 (1.39)	5.06 (1.39)	5.06 (1.38)	4.77 (1.29)	4.83**
<i>Pro-ecological worldview</i>						
Pro-ecological worldview	5.38 (0.62)	5.34 (0.56)	5.26 (0.63)	5.22 (0.66)	4.98 (0.79)	5.22***

Notes: ***p* < 0.01; ****p* < 0.001

Table 3. ANOVA table of differences between study fields in perceived interest of learning of sustainability competencies and the endorsement of pro-ecological worldview (Hyytinen et al. 2023)

- A student survey to study students' interest to learn sustainability knowledge and skills (2020)
- Students' interest in learning sustainability competencies and their pro-ecological worldview differed across fields of study (Hyytinen et al. 2023)
- Based on course pre- and post tests, there were indications of students' conceptual change about sustainability (Kettunen 2023)



SUSTAINABILITY COURSE (3 ECTS) LEARNING OBJECTIVES

AFTER COMPLETING THE SUSTAINABILITY COURSE YOU...

- Have become acquainted with the complexity and multidisciplinary of sustainability issues and the ethical and philosophical dimensions of sustainability.
- Understand the changes, and the related processes, phenomena and potential solutions to sustainability challenges related to course themes. You have become acquainted with the themes and in more depth with one of six themes: **a)** Global environmental commons, **b)** Human well-being and capabilities, **c)** Sustainable and just economies, **d)** Sustainable food systems and healthy nutrition, **e)** Climate change and just energy transitions **f)** Urban and peri-urban development.
- Have considered your roles as experts, actors and members of society in solving sustainability issues and have been given tools for solutions.
- Are able to discuss sustainability-related questions in an empathetic and constructive manner and understand other people's viewpoints and be able to take them into account.
- Can apply knowledge and skills related to sustainability in multidisciplinary project work and as experts in your field.



SUST-001 SUSTAINABILITY COURSE (3 ECTS) COURSE STRUCTURE

1. INTRO: Sustainability as a concept, the complexity of sustainability challenges and systemic approach

2. SOLUTIONS to sustainability challenges

Ongoing changes and new perspectives	THEMATIC MODULE A.	THEMATIC MODULE B.	THEMATIC MODULE C.	THEMATIC MODULE D.	THEMATIC MODULE E.	THEMATIC MODULE F.
Causes of change: underlying processes and phenomena	Global environ- mental commons	Human well-being and capabilities	Sustain- able and just economies	Sustain- able food systems and healthy nutrition	Climate change and just energy transitions	Urban and peri-urban develop- ment
Solutions to theme-specific sustainability challenges						

PROJECT WORK: Completing, presenting and evaluating the Sustainability solutions project assignment



SUST-001 SUSTAINABILITY COURSE (3 ECTS) COURSE STRUCTURE

1. INTRO: Sustainability as a concept, the complexity of sustainability challenges and economic approach

Mandatory module

2. SOLUTIONS to sustainability challenges

Mandatory module

Ongoing changes and new perspectives

THEMATIC
MODULE
A.

THEMATIC
MODULE
B.

THEMATIC
MODULE
C.

THEMATIC
MODULE
D.

THEMATIC
MODULE
E.

THEMATIC
MODULE
F.

Study one of the thematic modules

Causes of change:
underlying processes and phenomena

Global environmental commons

Human well-being and capabilities

Sustainable and just economies

Sustainable food systems and healthy nutrition

Climate change and just energy transitions

Urban and peri-urban development

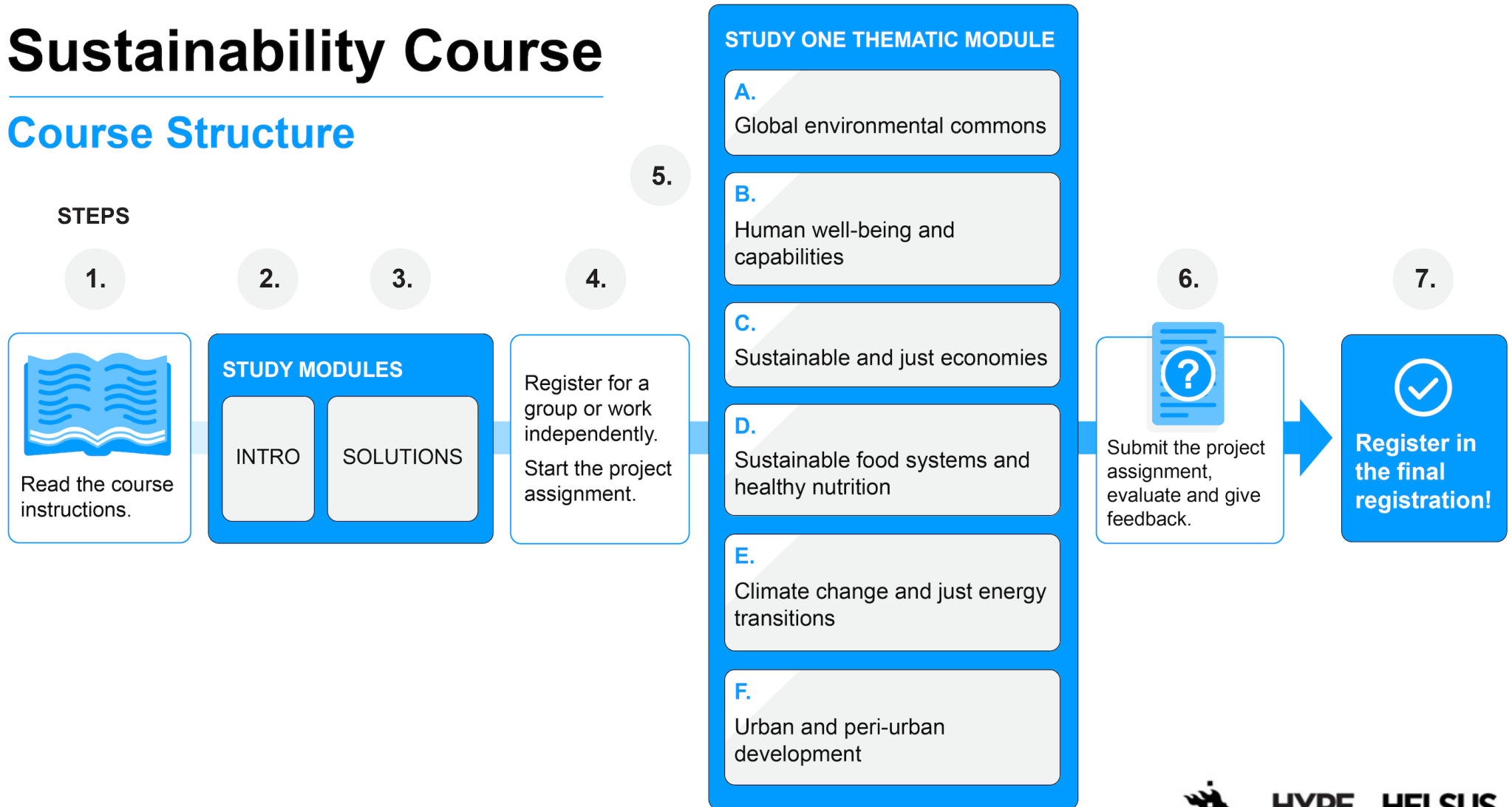
Solutions to theme-specific sustainability challenges

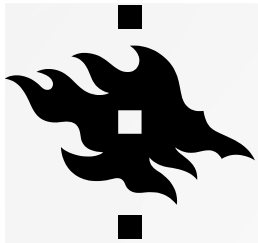
PROJECT WORK: Completing, presenting and evaluating the Sustainability solutions project assignment

Mandatory project work

Sustainability Course

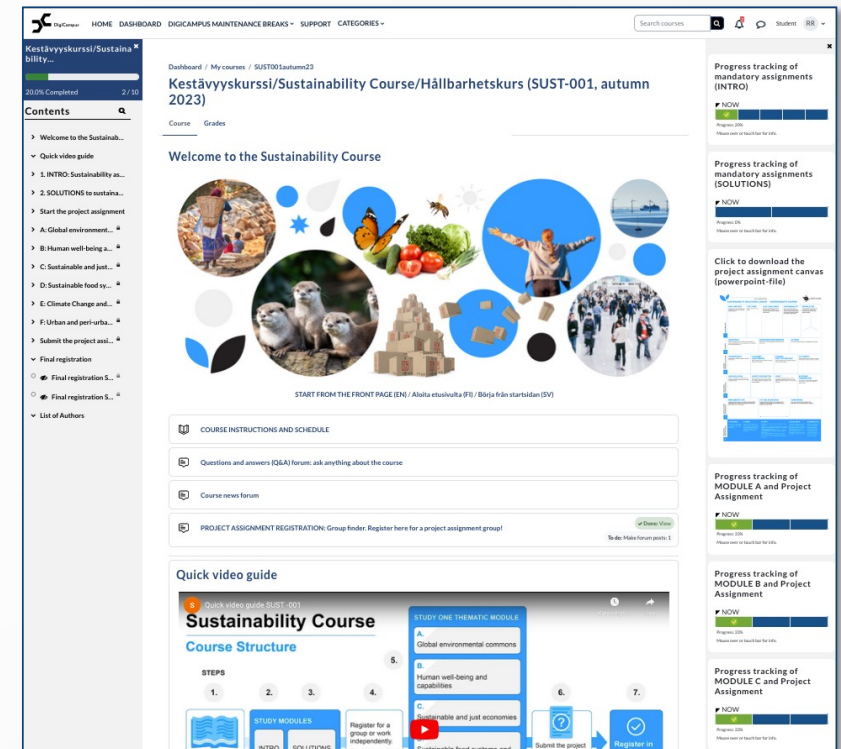
Course Structure





EXAMPLES OF LEARNING-DESIGN CHOICES MADE FOR THE COURSE

- To build a connectivist mooc (cMOOC), supporting students' autonomy, open activities, diversity and encouraging communication, cooperative learning and emergent knowledge.
- To support students' co-regulation and self-regulation, different (group) learning activities are used.
- To support external regulation, Moodle sends automated support messages based on the study progress, teacher's video messages have been pre-recorded
- To support students' motivation there is a variety of thematic modules to select from.
- Multilingual assignments and group work to promote linguistic competence



Connections of Sustainability - Michiru Nagatsu | University of Helsinki



























SUSTAINABILITY COURSE

CONCEPTS OF SUSTAINABILITY

MICHIRU NAGATSU

Katso: YouTube

[illegible]

Keskustelu ↓	Aloittanut:	Viimeisin viesti	Vastaukset	
			✓	Tilaa
☆ Phosphorus cycle	 Meri Mäk... 4 maalis 2021	 Meri Mäkelä 4 maalis 2021	0	 
☆ Particle pollution of the atmosphere	 Meri Mäk... 4 maalis 2021	 Meri Mäkelä 4 maalis 2021	0	 
☆ Ozone depletion	 Meri Mäk... 4 maalis 2021	 Meri Mäkelä 4 maalis 2021	0	 
☆ Ocean acidification	 Meri Mäk... 4 maalis 2021	 Sini Laakso 21 maalis 2021	2 	 
☆ Nitrogen cycle	 Meri Mäk... 4 maalis 2021	 Meri Mäkelä 4 maalis 2021	0	 
☆ Freshwater use	 Meri Mäk... 4 maalis 2021	 Carita Aapro... 20 maalis 2021	3 	 

Näen kolmiossa sen vääristyneen

A horizontal timeline illustrating the progression of human evolution and migration. The timeline is marked with vertical lines and labels above them. From left to right, the events are:

- First migration of fully modern humans out of Africa**: Indicated by a line starting at approximately 34 million years ago and extending to the right.
- Aborigines arrive in Australia**: Indicated by a line starting at approximately 34 million years ago and extending to the right.
- Migrations of fully modern humans from South Asia to Europe**: Indicated by a line starting at approximately 34 million years ago and extending to the right.
- Beginning of agriculture**: Indicated by a line starting at approximately 34 million years ago and extending to the right.
- Great European civilisations: Greek, Roman**: Indicated by a line starting at approximately 34 million years ago and extending to the right.

The timeline is marked with a vertical dashed line at 34 million years ago and a horizontal dashed line at 0. The word "Aborigines" is written in blue text below the timeline, and "Holocene" is written in blue text to the right of the timeline.

- 

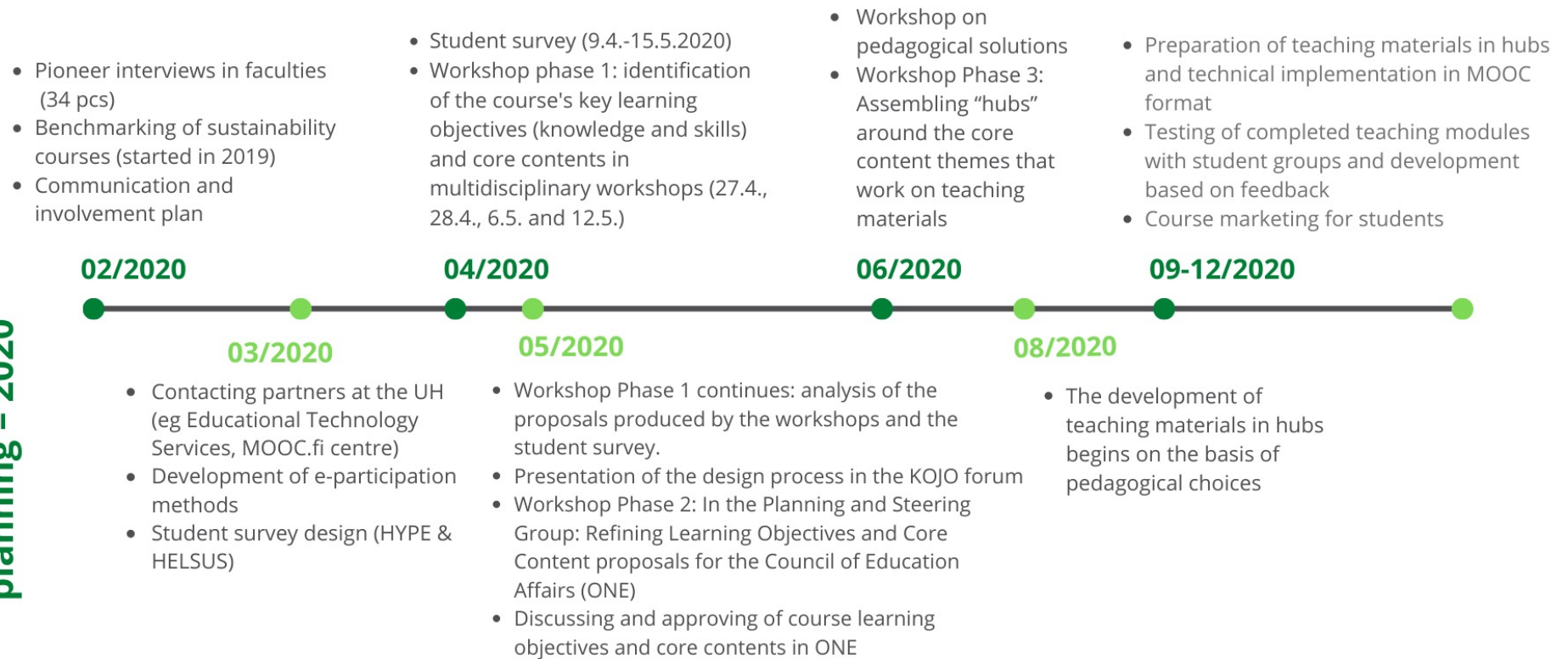


MANDATORY ASSIGNMENTS



PROJECT SCHEDULE AND COURSE PLANNING AND PRODUCTION IN MULTIDISCIPLINARY WORKING GROUPS IN 2020

Sustainability course planning – 2020





PROJECT SCHEDULE AND COURSE PLANNING AND PRODUCTION IN MULTIDISCIPLINARY WORKING GROUPS IN 2021–2022

Sustainability course planning – 2021–2022

- Recruitment of undergraduate teaching assistants
- 3 cr introductory MOOC as an open elective pilot course starts
- Course development based on feedback
- Translation of finished materials into Swedish and English, subtitling of videos



SPRING SEMESTER 2021



AUTUMN SEMESTER 2021

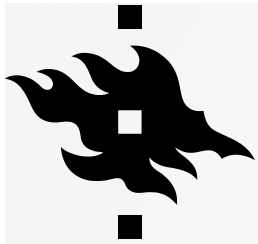
- Second test phase of the pilot course and collection of feedback
- Course development based on feedback

- Own development work of faculties and degree programs to build discipline-specific sustainability courses (2 erts)
- The faculties and degree programs themselves decide on the possible integration of the sustainability course (3 erts + 2 erts) into their curricula.



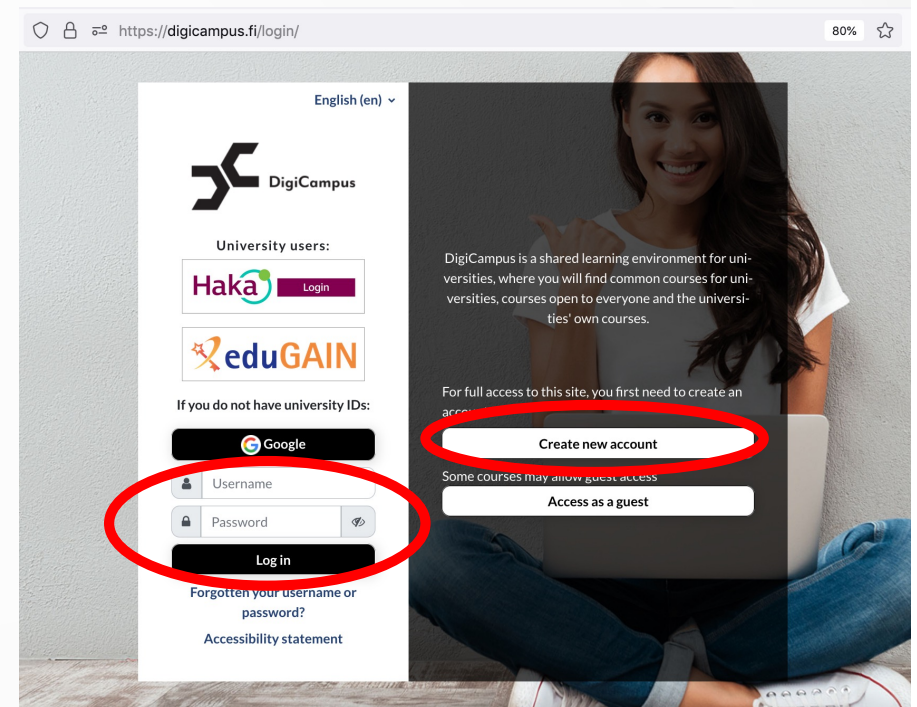
SPRING SEMESTER 2022

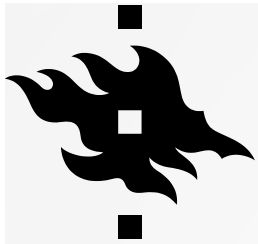




TRY OUT THE SUSTAINABILITY COURSE AT HOME

- Create a new DigiCampus account (or use Google-login if you have Google-account) in <https://digicampus.fi/login/>
- Please note, that you have to agree to the DigiCampus Terms of use and login to your email to activate your DigiCampus –account.
- When you have created your personal DigiCampus-account and activated the account in your email, please login to Sustainability Course Preview version in:
 - <https://digicampus.fi/course/view.php?id=3615>
 - Enrolment key: SustPreview23
- Familiarize yourself with the learning activities in the course area





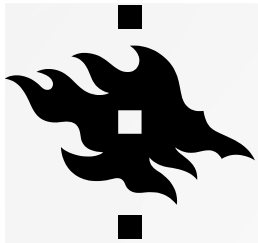
TRY OUT THE SUSTAINABILITY COURSE AT HOME

Analyze the Sustainability Course learning activities:

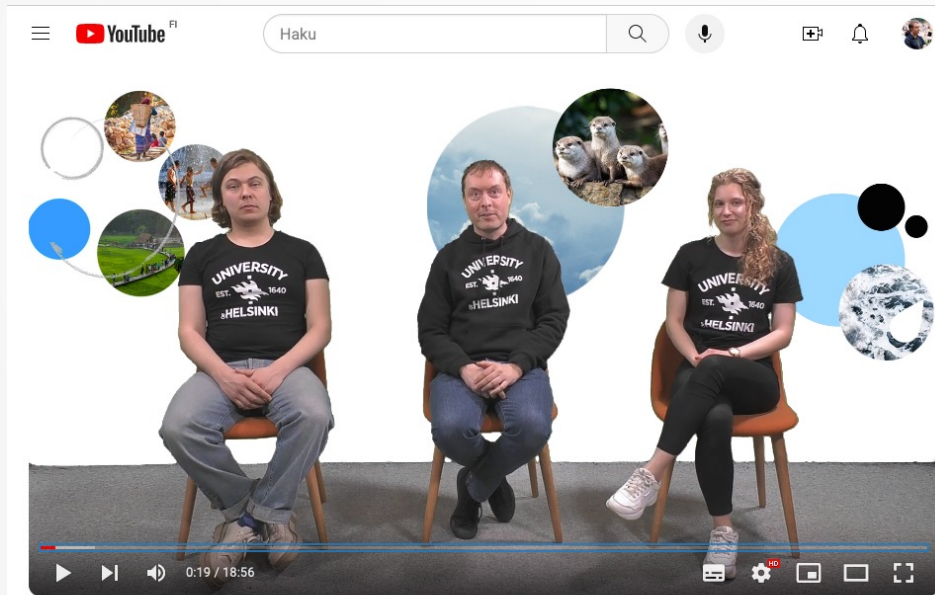
Can you find learning activities or design choices, that may

- ...support students' autonomy? ...encourage communication, cooperative learning and emergent knowledge?
- ...support students' co-regulation and self-regulation?
- ...support external regulation?
- ...support students' motivation?
- ...support multilingual co-operation and group work to promote linguistic competence?

The screenshot displays the user interface of the Sustainability Course (SUST-001, autumn 2023). The top navigation bar includes links for HOME, DASHBOARD, DIGICAMPUS MAINTENANCE BREAKS, SUPPORT, and CATEGORIES. The main content area is titled 'Welcome to the Sustainability Course' and features a central collage of images related to sustainability, such as people working together, a globe, and various natural elements. Below the collage, there is a section for 'COURSE INSTRUCTIONS AND SCHEDULE' with links to 'Questions and answers (Q&A) forum', 'Course news forum', and 'PROJECT ASSIGNMENT REGISTRATION'. A 'Quick video guide' section is also present, showing a video player and a 'Sustainability Course Course Structure' diagram. The right sidebar contains progress tracking for mandatory assignments (INTRO, SOLUTIONS), project assignment canvas, and modules A, B, and C.



A QUICK VIDEO GUIDE OF THE SUSTAINABILITY COURSE



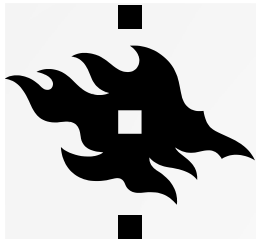
Quick video guide SUST -001

- If you like to learn more, please take a look at the course quick video guide (~19 minutes):
<https://youtu.be/vOxfzdBDppY>
- Or read more in our blog:
<https://blogs.helsinki.fi/uhsustained/>
- Or login to the Sustainability Course Preview version:
<https://blogs.helsinki.fi/uhsustained/2023/11/12/previewversion2023/>



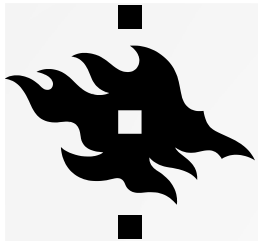
RESOURCES FOR SUSTAINABILITY IN HIGHER EDUCATION

- University pedagogical training (online learning materials by Finnish Universities): <https://unips.fi/modules/>
- Sustainability in Curriculum Design: Examples from the University of Helsinki, Finland: <https://blogs.helsinki.fi/uhsustained/>
- Climate University: online courses on sustainability (organized by the University of Helsinki): <https://climateuniversity.fi>
- MOOC courses (incl. sustainability themes) at the University of Helsinki <https://www.mooc.fi/en/#courses>



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THANK YOU!
ANY QUESTIONS OR COMMENTS?