

# Integrating sustainability into basic science classrooms

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# Guess the gap – Why integrated sustainability in education?

- “3% of people attend university but they take up 80% of the leadership positions” – Chuck Hopkins, UNESCO Chair
- The destruction of the planet is not the work of ignorant people. Rather it is largely the result of work by highly educated people. (Orr, 2004).

*“At present most of our universities are still leading the way in advancing the kind of thinking, teaching and research that...accelerates un-sustainability” (Wals, 2008)*

# Guess the gap - Why integrated sustainability in education?

EPFL Alumni about environmental responsibility: (Alumni survey 2022, graduates 2014-2018)

- 30% : “sustainability is missing in the EPFL curriculum”
- 60% : “my environmental and sustainability skills are weak”

*“We should prepare students for the work of the world not only for the world of work” (Johnaton Porritt)*

# Definition of sustainability



# Q1 - Why integrating sustainability in basic science teaching?

- What is our legitimacy? (We are not experts)
- Shall we do it without an ideological position and how?

Some leads :

- No one is an expert (and it's ok!)
- A problem for everyone...
- Something is better than nothing
- “sustainability isn't a skill that you can learn, more a tool that you can use”

## Q2 - Why and how integrating sustainability in basic science teaching?

- What are the objectives/ learning outcomes?
- What students would benefit from learning sustainability in an *algebra* course?

# Q3 - How to integrate sustainability in basic science teaching?

- What is a good approach/ method?  
(time management, changing study plans, exercises, invite external speakers, etc.)
- How would you deal with emotional reactions/ political debates that might arise in your classroom?

# Our workshop's goal

Develop a ***guideline*** to support basic science teachers who would like to integrate sustainability in their course:

- Which arguments could be used to justify/ support their decision (to integrate sustainability in their course)?
- What strategies fits the best the basic science curriculum and how to implement them?

What you will get:

- ready-to-use slide deck
- *Why* and *how* manifesto



# ICEBREAKER

(division in groups)



# Activity's agenda

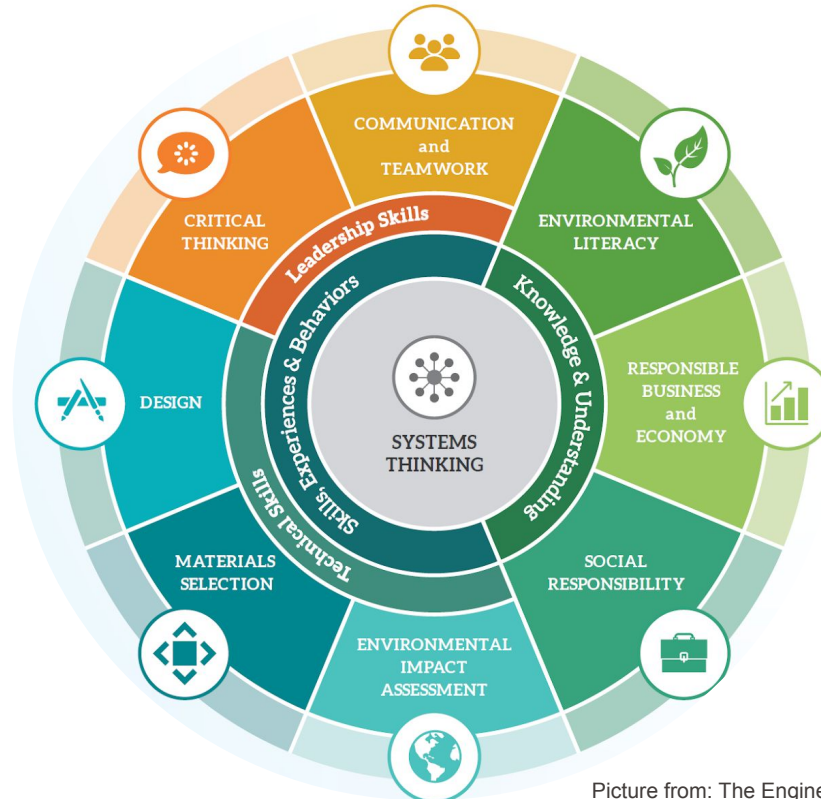
- 15min **discussion** in groups
- Approx. 2min **debrief**

## SWAP QUESTION

- 15min **discussion** in groups
- Final debrief



# DISCUSSION: Sustainable competences



# Wrapping Up !

An insight from your table which would be particularly helpful for future work?  
(1' per table)



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## Let's keep in touch!

# Resources in English

- [Faculty for a Future](#): a searchable database of open-access educational resources
- [Sustainicum Collection](#): a database of teaching units and teaching methods
- [SDG academy](#): a platform with courses searchable per SDG
- [The MIT Sustainability and Climate Change Across Learning Environments platform](#): a platform with a) Climate and Sustainability Explainers, b) a Lesson & Activity Database, c) Pedagogical Practice Explainers
- [GeorgiaTech's serve-learn-sustain teaching toolkit](#): a toolkit searchable by tool category, type and length
- [Sowing seeds -How to make your modules a bit more sustainability oriented](#): A guide developed by the University of Plymouth's
- [En-Roads](#): An MIT Climate scenario simulator
- [Vanderbilt University's Tips for Teaching Sustainability](#): a guide for teaching sustainability
- [SDG Impact Assessment Tool](#): a free, online, learning tool that visualises the results from a self-assessment of how an activity, organisation or innovation affect the SDG
- [Engineering for one planet](#): a framework co-developed with experts from academia and industry that outlines essential sustainability-focused learning outcomes for engineering education

# Resources in French

- [Enseigner le climat](#): a database of climate educational resources
- [Université virtuellement environnement et développement durable](#): a virtual university with MOOCs, podcasts and educational resources
- [Guide pour l'intégration de la durabilité dans les enseignements](#): a guide developed by HES-SO in the framework of the programme “former pour transformer”
- [Flashlearn HES-SO](#): mini MOOCs on sustainability developed by the HES-SO for teachers et students

# Other references

<https://archive.univ-irem.fr/spip.php?rubrique290>

<https://carboneetsens.fr/conversations-carbone-en-france/>

<https://www.cnrs.fr/fr/personne/climatictac>

<https://wid.world/>

<https://ourworldindata.org/>

<https://fr.wikipedia.org/wiki/Daisyworld>

<http://dataphys.org/list/>



## WRAP UP Discussions:

- Regarding "why"
  - Instead of asking "Why dealing with sustainability in basic science?" , ask "Why dealing with basic science in sustainability?", or put differently "How can basic science-related knowledge/skills be leveraged for sustainability knowledge/skills?"
- Regarding "how"
  - Foster the use of interactive/participative formats when possible, such as inverse class, case studies, etc.
  - Bridge disciplines, and look for examples at the interface between disciplines.
  - Change the teacher posture, to give more space to emotions, and discussions on values
- Most students at EPFL/ETH will end up with management positions, but we train them for calculations. The world is bigger than calculation.
- Need to redefine basic sciences: Management could be one. Maths/physics/etc can be "history"
- Basic science teach students how to reduce complexity of a problem, but if teachers reduce the complexity too much, then they only learn to solve (too) simple problems. They need to learn about how to reduce complexity without reducing too much so they learn about real life problems.
- Science ignore emotional aspects but they are a part of this world.