ICT as a driver and as a barrier to sustainable development - a pedagogical perspective

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Outline

- The wicked nature of sustainability
- Learning our way out of unsustainability?
- From biophilia to videophilia and back – entering ICT
- The Big Five in Sustainability-oriented learning

BREAK-OUT SESSION – SMALL GROUP DISCUSSION

- Reporting Back Key Messages
- Wrap-up and concluding remarks
Doubt over climate science is a product with an industry behind it

With its roots in the tobacco industry, climate science denial talking points can be seen as manufactured doubt.

Image: The manufacturing of doubt on climate change science, backed by the fossil fuel industry, has its roots with the tobacco industry’s assault on climate science in the 1960s. Photograph: Richard Hamilton Smith/Richard Hamilton Smith/Corbis

Source: The Guardian
plantbottle™
up to 30% plant-based
100% recyclable bottle
redesigned plastic, recyclable as ever.
“While we marvel at Nasa’s discoveries, we destroy our irreplaceable natural resources – so we can buy pre-peeled bananas and smartphones for dogs”

No simple questions, no simple answers

- Are GMO-foods inevitable to feed the world?
- Is human-caused climate change a fact?
- Are biofuels sustainable?
- Are solar panels sustainable? Wind-turbines?
- Is ‘organic’ sustainable?
- Is local food more sustainable than imported food?
- Are vegetables grown in cities healthy?
- Are energy-saving light bulbs more sustainable than conventional ones?
Wicked problems in unusual times...

- Complexity and uncertainty
- Confusion, ambiguity, extinction of ‘truth,’ lack of ‘trust’ in science and in government
- Hyper-connectivity – erosion of meaning, short attention spans – loss of ‘place’ – ‘viral nonsense’
- Dominant neo-liberal economic forces accelerate inequity and material values that normalize and breathe unsustainability
- Need for continuous learning in a ‘reflexive’ society
The Doughnut of social foundations and planetary boundaries (Raworth 2017)
We are the students of today attending the schools of yesterday being taught by the teachers of the past— with methods from the Middle Ages to solve the problems of the future!
Given today’s global challenges, can ICT-supported learning disrupt hegemonic mind-sets, routines and values and pave the way for alternative ones that lead to a more sustainable way of living?
“Biophilia” is “the innate tendency to focus on life and lifelike processes” (Wilson, 1984)

“Videophilia” is defined as “the new human tendency to focus on sedentary activities involving electronic media” as watching TV/movie, home or theatre, surfing on internet or playing video games.
‘Nomophobia’ and ICT-addiction
ICT-driven Psychic Numbing
"The sad part is they're talking to each other."
‘We are drowning in information while starving for wisdom.’

E.O. Wilson, 1998, p. 300)
A clear problem with a clear solution

Predictable
Straightforward
Obvious

The problem and the solution are not clear but can be understood with time

Many familiar elements
Hidden root courses
Non-linear
Inter-operating parts affect each other

Problem and solution not understood and keep shifting when we try to define them

Ambiguous, chaotic
Many stakeholders with conflicting perspectives
Many elements are hidden and unknown
No right/wrong solution
Not-quantifiable
No precedents

Source: Rob Gibson, 2013
Five interrelated key area’s for sustainability science & education

Area 1: Understanding change, complexity and transitions
Area 2: Dealing with values, ethics and moral dilemmas
Area 3: Building agency and transformative capacity
Area 4: Utilizing diversity, uncertainty and dissonance
Area 5: Boundary crossing, systems thinking and connectivism
Area 1: Understanding Change, Complexity & Transitions
Doing what we do better vs doing better things...

- GMO
- closed-cycle design
- blue revolution
- metropolitan agriculture
- cradle-to-cradle
- > food literacy
- > resource efficiency
- < food waste
- circular economy
- protein alternatives
- food justice
- food waste

Adapted from Wageningen UR
A mix of approaches?

technological developments
incremental
transition

societal developments
incremental
transition

flipped classroom
MOOCS
digi-boards
curriculum
greening
add-on
denial

learning
ecologies
build-in
whole system
re-design
whole institution
approach
alternative pedagogies

whole institutional
approach

WAGENINGEN UR
For quality of life

UNIVERSITY OF GOTHENBURG
Area 2: Considering ethics and normativity
Area 3: Building Agency and Transformative Capacity
Area 4: Creating Vital Coalitions Utilising Diversity
Area 5: Boundary crossing & seeing connections

Source: creative commons
THE INDUSTRIAL CUP OF TEA

Source: CDI, MSP-Guide, Wageningen
UR 2015
Break-out session

- We will split in groups of 4-5 people. Every group will start with short introductions (who you are and why you are here). Two questions to be discussed. First one is the same for all groups: *How can ICT be used to connect students meaningfully to wicked sustainability issues?*

The second one focusses on one of the 5 learning areas described. How can ICT help students:

1. understand change, complexity and transitions
2. deal with values, ethics and moral dilemmas
3. build agency and transformative capacity
4. utilize diversity, uncertainty and dissonance
5. cross-boundaries, think holistically/relationally

[Logos for Wageningen UR and University of Gothenburg]
# Sustain“abilities”

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<tr>
<th>Sustainability competence</th>
<th>Examples of sustain’abilities’</th>
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| **Dynamics and content of sustainability**                      | Sustainability literacy  
Systems thinking  
Adopting an integral view  
*Learning to know*                                                                 |
| **Critical dimension of sustainability**                        | Questioning hegemony and routines,  
Analysing normativity  
Disruptiveness, transgression  
*Learning to critique*                                                                 |
| **Change and innovation dimension of sustainability**           | Leadership and entrepreneurship  
Unlocking creativity, utilizing diversity  
Appreciating chaos & complexity  
Adaptation, resilience  
Empowerment and collective change  
*Learning to make change*                                                                 |
| **Existential and normative dimension of sustainability**       | Connecting with people, places and other species  
Passion, values and meaning-making  
Moral positioning, considering ethics, boundaries and limits  
*Learning to be, learning to care*                                                                 |
Responsible Research and Inquiry

Future-studies abilities
Future-oriented ethical abilities
Pro-activity & well-timed engagement

Self-awareness
Situational awareness
Social awareness & empathy
Ethical thinking
Disruptive thinking

Navigating Complexity or Wickedness
Adaptability
Agency

Multi-perspective & inter-cultural communication
Participatory ability
(Trans-disciplinary) collaboration
Openness & Transparency

Source: Tassone et al. *in press*
Adapted from Siemens, G. (2005)
Strands of Citizen Science

- Science driven citizen science
- Policy driven citizen science
- Expert-driven
- Civilian driven
- Closed
- Open
- Curiosity driven citizen science
- Transition civic science

Why Citizen Science?

1. Civilians can become more meaningfully engaged when they are empowered and equipped to monitor data about their own environment.

2. Civilians come to understand the nature of scientific knowledge, the meaning of data (validity & reliability) better when actively engaged in scientific inquiry.

3. Civilians discover how easy and quickly one can become an expert in a specific issue in their own local environment.

4. Access to cheap ICT with enormous monitoring and storing capacity makes ‘doing science’ easier and more affordable.

5. By self-monitoring the impact of one’s own actions, one can become more reflexive and effective in bringing about change.
Sustainability is not just something to learn, it's something to live!

- Students should learn about sustainable development and global citizenship to help them understand the world they live in.
- School garden programmes can teach healthy eating and help build an emotional connection with the natural world.
- Education is the best tool for climate change awareness.
- Schools should build relationships and engage with community issues.
- Students, parents, teachers, principals, school management and the community should be involved in school decisions.
- The whole school approach to sustainability brings together what is taught, how it's taught, extracurricular activities, teacher training, decision making processes, the physical buildings, the environment, and the wider community.

Source: UNESCO - GEM2016
Closing questions

- Should all education engage with sustainability or should there be designated spaces for such engagement?
- How can the five key learning areas identified become a bigger part of higher education?
- How can ICT-assist the development of sustain"abilities”?
- What does this imply for teacher’s professional development university’s? What’s there already? What may need more attention?