Science as community: Sustainability-oriented transdisciplinary research

Arjen E.J. Wals
Outline

1. Unsustainability, change & confusion
2. Hybrid learning in post-normal times
3. Science as community - phronesis
PLASTIC AFVAL KUN JE BETER SCHEIDEN
afval is voedsel

Gemeente Amsterdam

Afval Energie Bedrijf
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100% recyclable bottle
redesigned plastic, recyclable as ever.
THE MAGIC OF MARKETING

GREEN SKYSCRAPERS
GREEN AIRCRAFT
GREEN POWER
GREEN WASTE DISPOSAL
GREEN CARS
GREEN PACKAGING

It's too much... but is it enough?
Erosion of trust in science?

- Deepwater horizon
- Runaway (?) climate change
- Calcium supplements for women
- Should men >50 be tested for prostate cancer?
- Is organic sustainable and locally grown better?
- Are vegetables grown in cities healthy?

‘We are drowning in information while starving for wisdom’ E.O. Wilson, 1998, p. 300)
Post-normalism

- Complexity
- Uncertainty and indeterminacy
- Contestation and controversy – extinction of ‘truth’ & erosion of ‘trust’ (fact free science, fact free politics, science as opinion)
- Shallowness and hyper-connectivity – erosion of meaning
- Emergence - reflexivity
“The conventional wisdom holds that all education [and research] is good, and the more of it one has, the better…. The truth is that without significant precautions, [it] can equip people merely to be more effective vandals of the Earth” (D. Orr).
Trends and counter-trends in higher education

**trend**  **counter-trend**

1. Science for impact factors – science for society
2. Increasing efficiency– promoting authentic learning
3. Science as ‘commodity’ – science as ‘community’
Science for impact factors – trend

Time to read/review

What’s your h-factor?

n-scientists

n-publications

1990  2000  2010
Science for society – counter trend
Increasing efficiency - trend

- Diplomas factory
- Increasing efficiency - trend

Top Ten OECD Countries by College Teaching Staff to Student Ratio

©2010 David Bleier for "Ranking America" (http://rankingamerica.wordpress.com)

Data from OECD

http://www.oecd.org/document/62/0,3343,en_2649_39263238_43586328_1_1_1_37455,00.html
Authentic learning – counter trend
Science as commodity - trend

- More private funding
- Billable hours
- Accountability
Science as community – counter trend
<table>
<thead>
<tr>
<th>Research orientation</th>
<th><strong>Science as commodity</strong></th>
<th><strong>Science as community</strong></th>
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<tbody>
<tr>
<td><em>Science for Impact Factors</em></td>
<td><em>Science for Impact</em></td>
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<td><strong>Educational orientation</strong></td>
<td><strong>Efficiency</strong></td>
<td><strong>Authenticity</strong></td>
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<td>Students as clients, input, throughput and output</td>
<td>Students as citizens who want to engage in meaningful learning around authentic issues</td>
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<td><em>Instrumental</em> – transfer of predetermined and relatively fixed outcomes</td>
<td><em>Emancipatory</em> – high degrees of self-determination, space for transformation and co-created and emergent outcomes</td>
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<td><strong>Business orientation</strong></td>
<td><strong>Focus on continuous growth</strong></td>
<td><strong>Focus on dynamic quality</strong></td>
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<td><strong>Epistemological orientation</strong></td>
<td><strong>Empirical rationalism</strong></td>
<td><strong>Socio constructivism</strong></td>
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<td><strong>Type of knowledge generated</strong></td>
<td><strong>Scientific and technical knowledge</strong> that can (allegedly) be generalized across contexts.</td>
<td><strong>Phronesis</strong>: <em>ethically practical knowledge</em> that is indispensible for the work of making context specific value judgments about ends and means.</td>
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Source: Peters & Wals, *in press*
Rethinking science
Goals have been set in advance

Expert driven

Goals are jointly set

Democracy driven

Transition Network.org
Authoritative Hierarchical Training

Closed
Predetermined
Prescribed

Instructors
Passive receivers
Knowledge transfer
Universal

Open
Self-determined
Co-created

Coaches
Active receivers
Knowledge circulation

Participatory Democratic Social Learning

Facilitators & co-learners
Active-empowered
Knowledge co-creation
Contextual

Universal
Active.empowered
Knowledge co-creation
Contextual
Practical Theory Building

WHAT IS
Sharing, analyzing, interpreting, critiquing... the way things are and came and remain to be

PRAXIS
Transformative processes of reflection & action

WHAT SHOULD BE
In light of what we know, value, wish to advance and strive for: imagining and determining

HOW TO DO IT
Determining how to keep and/or make things the way should be considering what is and what should be

- Dealing with difference, tensions, dilemmas, tensions, conflicts & contradictions
- Building and exercising power
- Constructing and utilizing different kinds of knowledge
- Posing and setting problems
- Considering theories of change, action and learning

- Race, gender, etc.
- Religion, faith, spirituality
- External, internal power, agency, money, interests
- Short term vs long term
- Means – ends
- Political theory
- Specific skills, tools and methods

Source: Peters & Wals, in press
Contemplating
Space for participation & ownership, whose learning?

Orientating
- Exploring issue at stake
- Assessing the playing-field
- Determining instrument mix
- Establishing core organisation

Evaluating
- Is the solution adequate?
- Was the process used adequate?

Environment
- Communication with stakeholders not represented in the core group
- Communication with peripheral actors

Formal decision-making

Activating
- Selecting key actors
- Expanding core organisation
- Exploration of available relevant perceptions, imaginable futures & knowledge
- Utilizing dissonance

Selecting
- Exploring possible solutions
- Creating a shared vision
- Choosing options/solutions
- Designing plan of action

Divergence

Convergence

Implementation
of selected plan of action
Hybrid Learning Configuration

- A vital coalition of multiple stakeholders engaged in a common challenge using a blend of learning processes in a rich context (sum>parts)
Connectivism: Process of creating network

Source: George Siemens, 2008
Thank you!