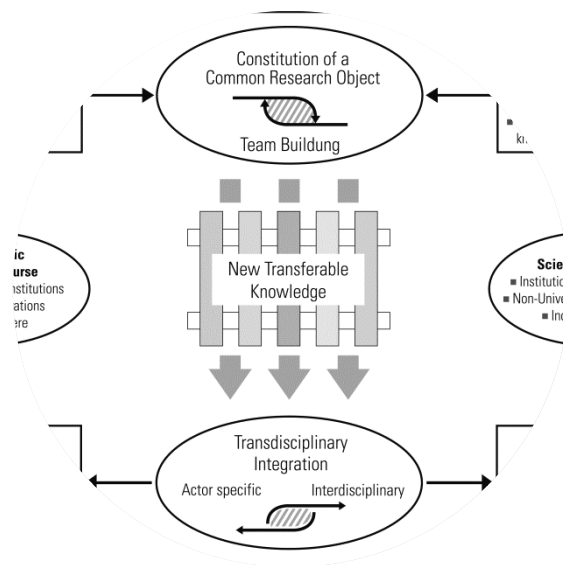


The value of a conceptual model of transdisciplinarity to enhance students' reflexive skills

Theory framework and experimental design

11 April 2013, Karen Fortuin & Kris van Koppen



Science faces challenges in addressing sustainability issues

Complexity challenge

How to combine expertise from various disciplines as well as from outside academia?

Impartially challenge

How to ensure that research serves the common interest, rather than the interests of some groups?

Salience challenge

How to produce knowledge that is useful for decision makers?



Changes are required

How can universities / science / scientists
respond more effectively
to the challenges of sustainability?



What about the role of the scientist?

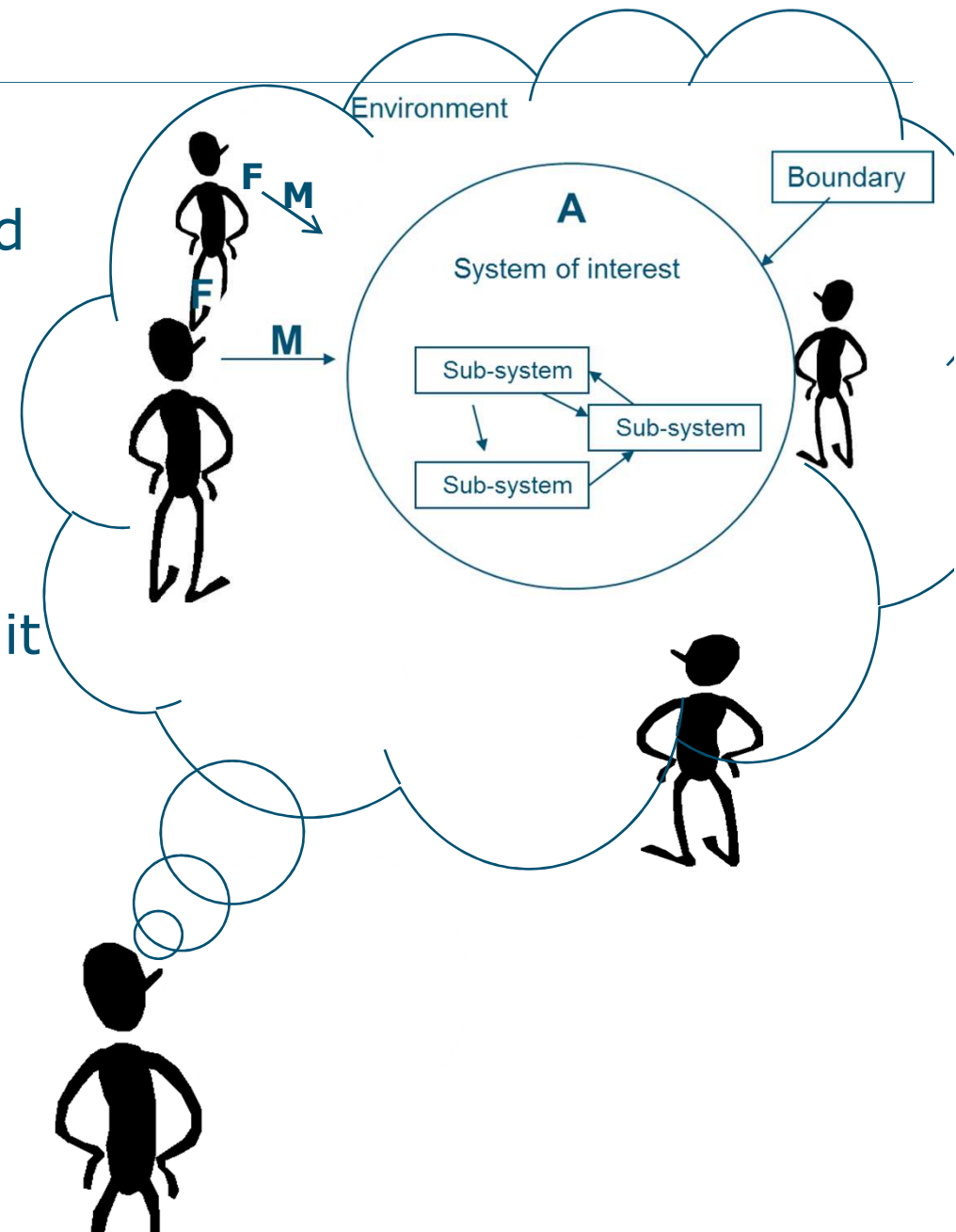
- Scientists are involved in transdisciplinary approaches and use (modeling) tools
- I argue that
 - These scientists need to change as well
 - This should start at academia
 - Academic education should enable *reflexive learning*

Reflection

Pensively looking at the world
and at oneself

Here:

–at the transdisciplinary
process and one's own role in it



Reflexivity is required in cross-disciplinary research

- Scientific disciplines have different “cognitive maps”
- Scientists need to be aware of fundamental differences between (disciplines) scientists
 - Societal context of research
 - Validation of evidence
 - Perceived nature of the word
 - Reductionistic versus holistic science

(Eigenbrode et al. 2007)

Reflexivity is crucial in transdisciplinarity

Scientists should

- acknowledge the validity and value of multiple ways of knowing (disciplinary, interdisciplinary and experiential)
- assert that integrating various epistemologies results in a more complete understanding of the complexity of a situation or problem
- accept that operationalizing these different approaches may require continual negotiations
- collaborate and find ways to accommodate the different approaches

(Miller et al. 2008)

Pitfalls in transdisciplinarity

- Lack of scientist engagement
- Lack of partner engagement
- Implicit normative bias of scientists
- Lack of normative responsibility of scientists

Reflexivity is needed in transdisciplinary approaches

- To improve the outcomes
- To enhance collective learning
- To avoid pitfalls

How to teach reflexive skills?



A framework for reflexive learning

Theory



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(Dyke, 2009)

A framework for reflexive learning



A framework for reflexive learning

Reflection



A framework for reflexive learning

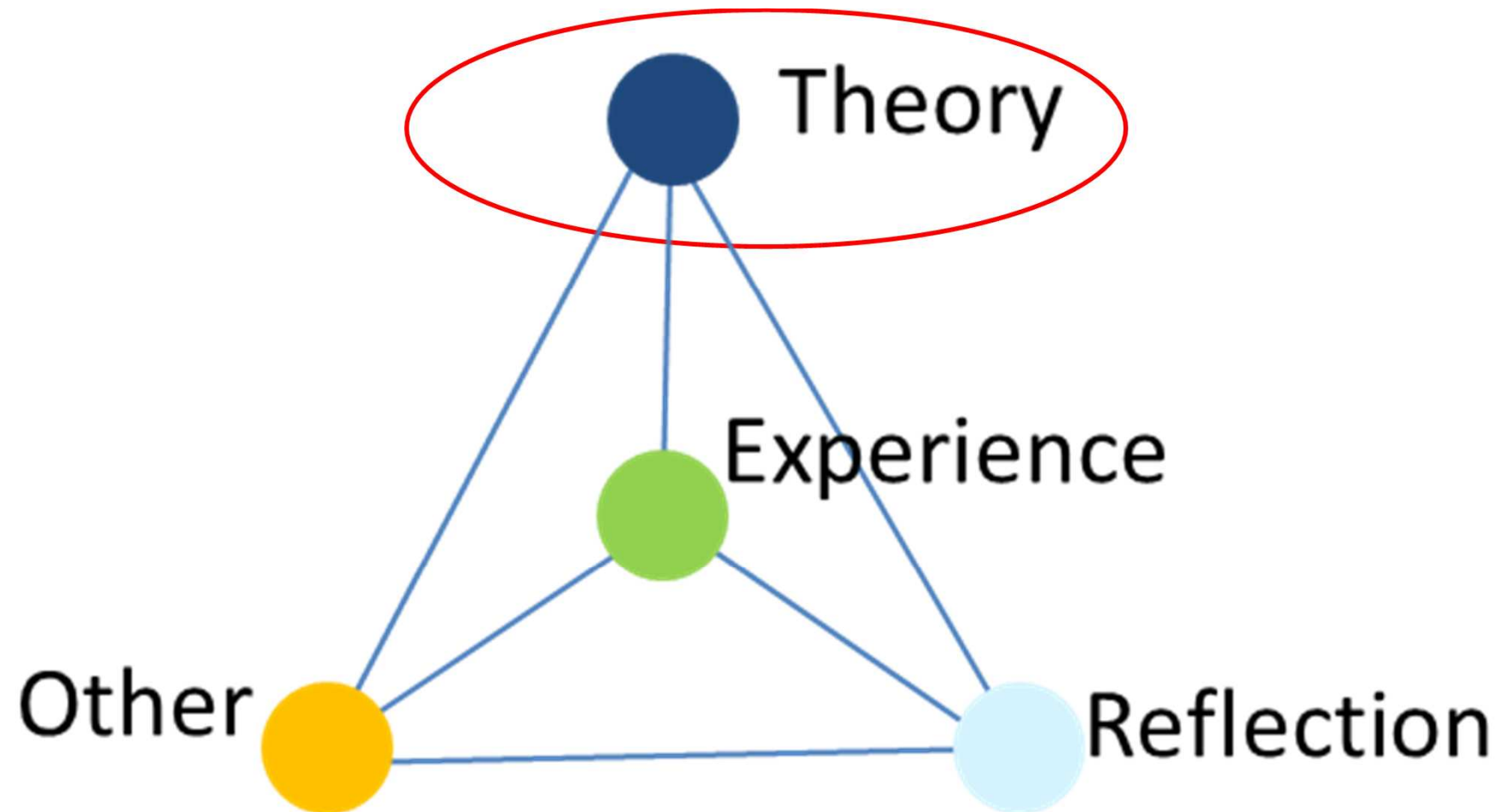


Others

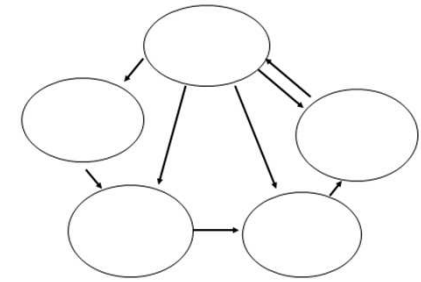


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Core elements of reflexive learning



Theory: Conceptual models

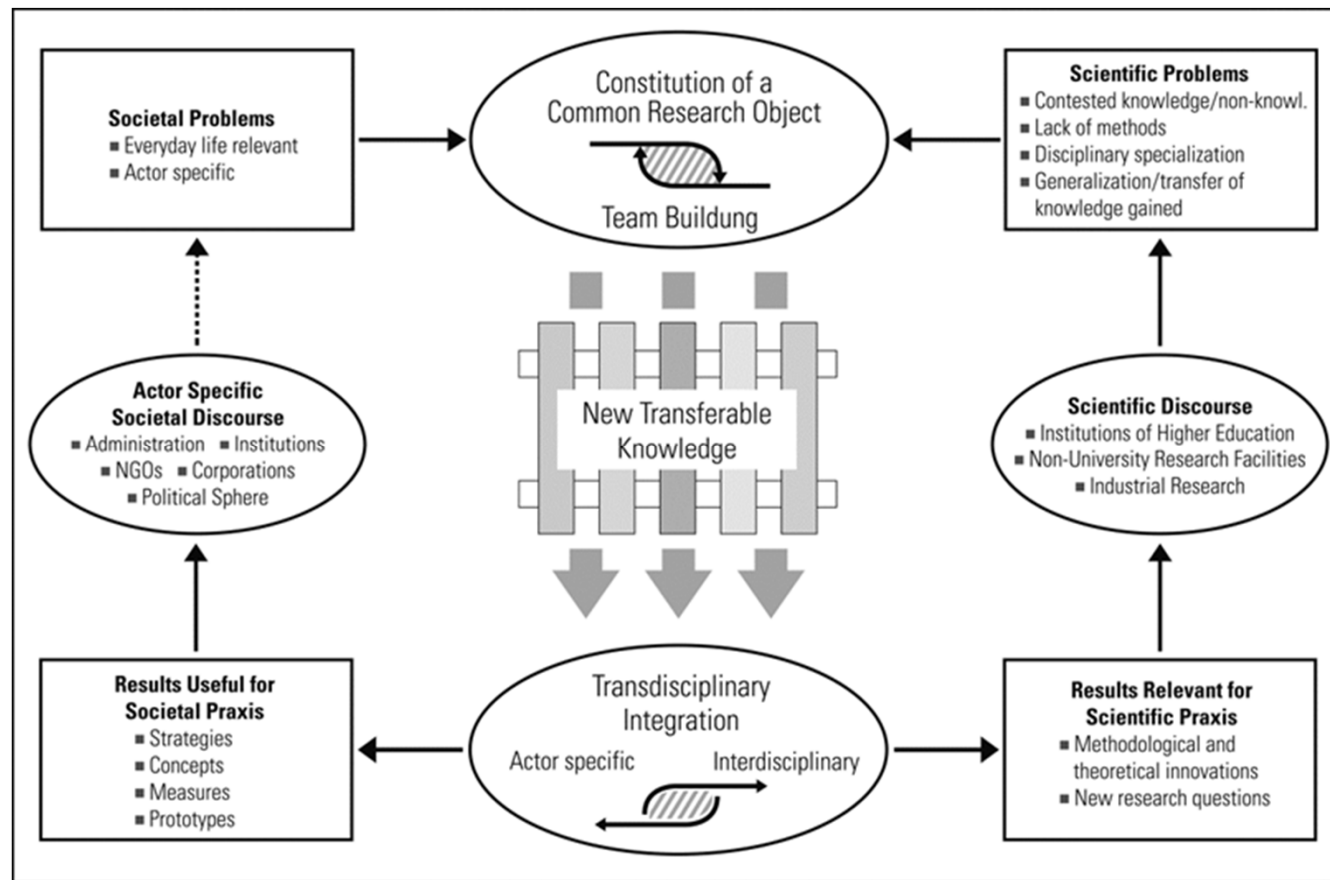


- Visualizations and simplifications of reality

Value in inter- and transdisciplinary education

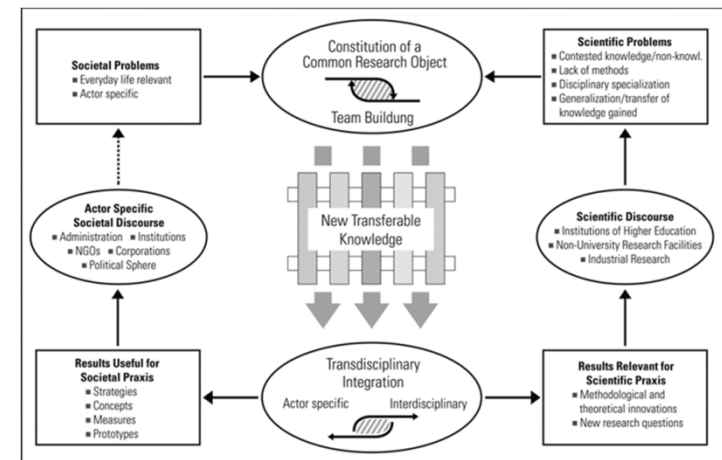
- Can provide a common framework to analyze and describe complex systems, and to integrate knowledge from different disciplines
- Can be a tool to communicate across disciplines
- Can be a heuristic tool in a collaborative research project
- ...

A model of the transdisciplinary research process

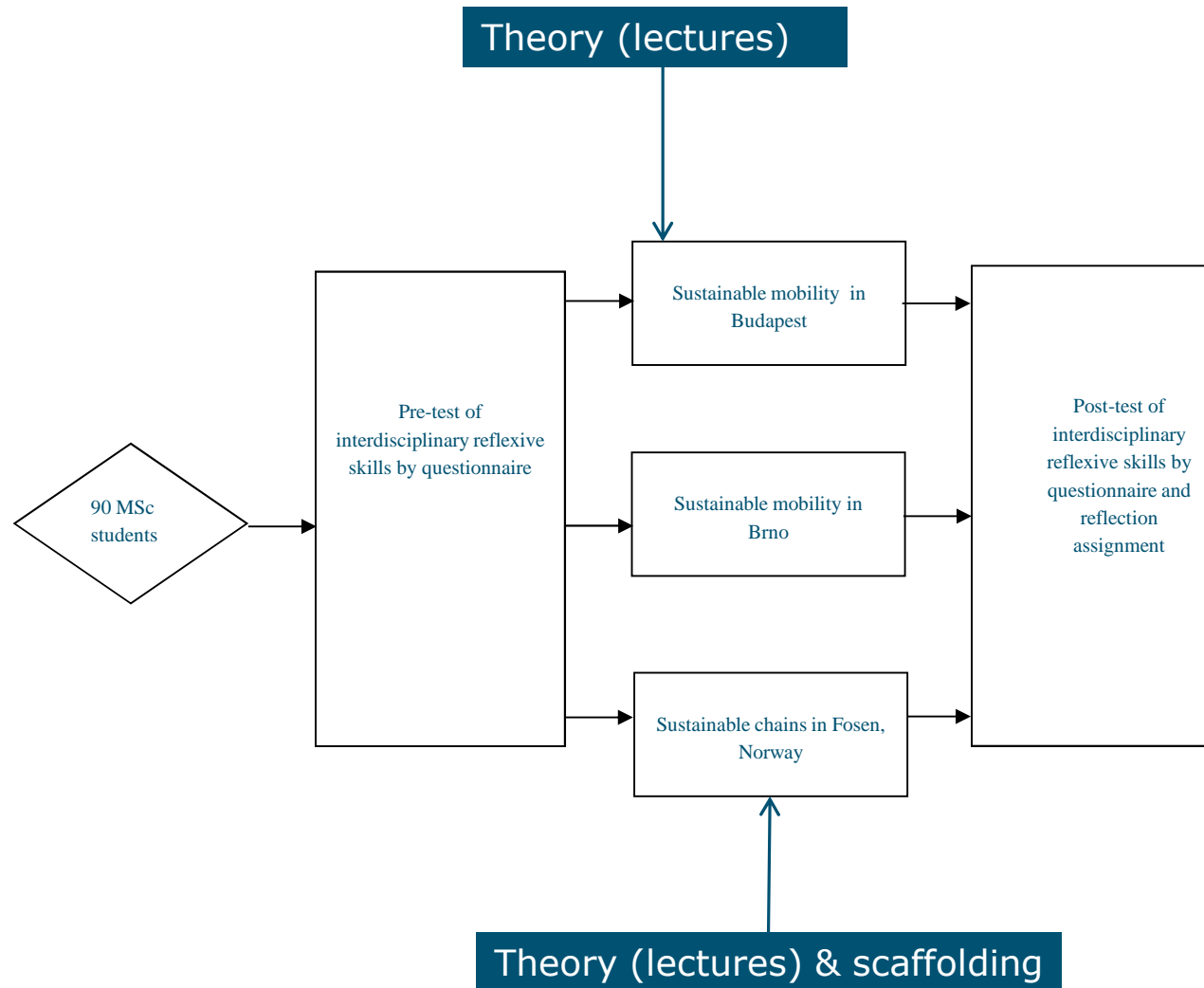


Value of the Jahn model

- to explain the difference between societal problem solving and doing scientific research
- to explain and analyse characteristic stages of the transdisciplinary research process and to discuss basic methodological implications (e.g. problem framing, producing knowledge, integrating and applying knowledge)
- to identify and explain knowledge aspects in the transdisciplinary research process
- to identify and explain normative aspects in the transdisciplinary research process



A pseudo-experimental design



Teaching reflexivity: educate students who are able to:

- critically assess the contribution of major relevant scientific disciplines as well as non-academic knowledge to address a societal problem
- critically assess the entering of norms, values and interests into a research process that addresses a societal problem as well as into the design of strategies, technologies or scenarios that address this problem
- critically assess one's own position and contribution (in terms of scientific and other knowledge, interests, norms, and values) in addressing the problem



Thank you!

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