

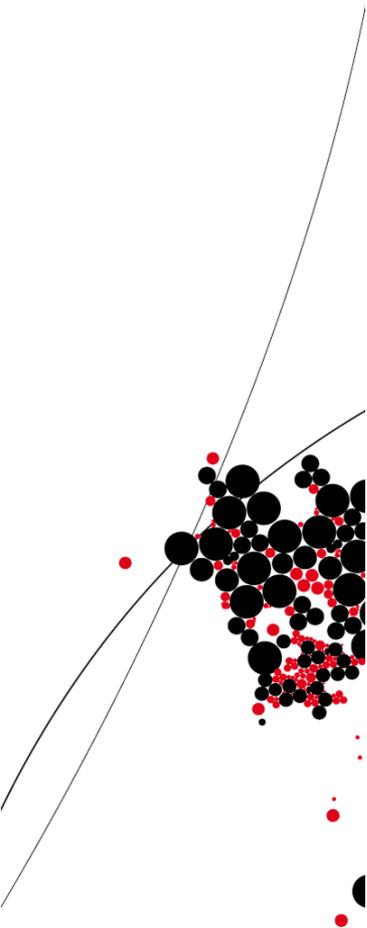
Building and studying innovations in learning: Educational Design Research:

*Keynote Address at SCIL, the
Swiss Centre for Innovations in Learning
Annual conference, June 6-7, 2013, St. Gallen, Switzerland*

Susan McKenney

Open University & Twente University

UNIVERSITY OF TWENTE.



Some background: Susan McKenney

- Former pre-school teacher
- Currently: researcher, teacher, developer & consultant
 - Curriculum development
 - Educator professional development
 - Technology integration
- In service of teaching and learning practice
- Often using a particular approach: Educational design research



Some background: Today's group

- Research is conducted to learn about the world, and/or phenomena in it
- Before we talk about this particular form of research, let's take a moment to think about key concepts that influence our views of research



Briefly ask yourself the following 3 questions...

What is reality?

One true reality?

- Researchers seek the truth
- Researchers seek consensus (e.g. inter-rater reliability)

Multiple realities?

- Researchers place high value on subjective impressions
- Researchers seek multiple interpretations (e.g. and try to describe them well)



What is knowledge?

Knowledge is objective

- Researcher, participant and topic are independent
- Values: Dualism, objectivism (e.g. reduce biases)

Knowledge is subjective

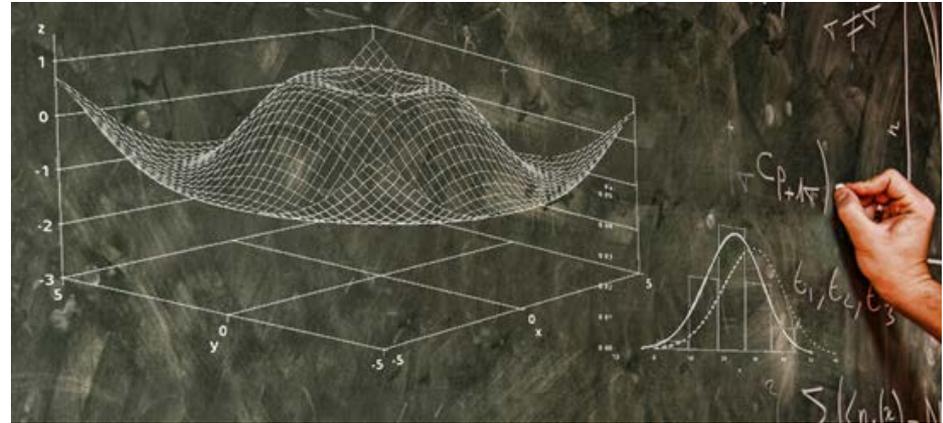
- Researcher, participant and topic are dependent
- Values: Depth, intense interaction (e.g. undercover agent)



How is research (ideally) conducted?

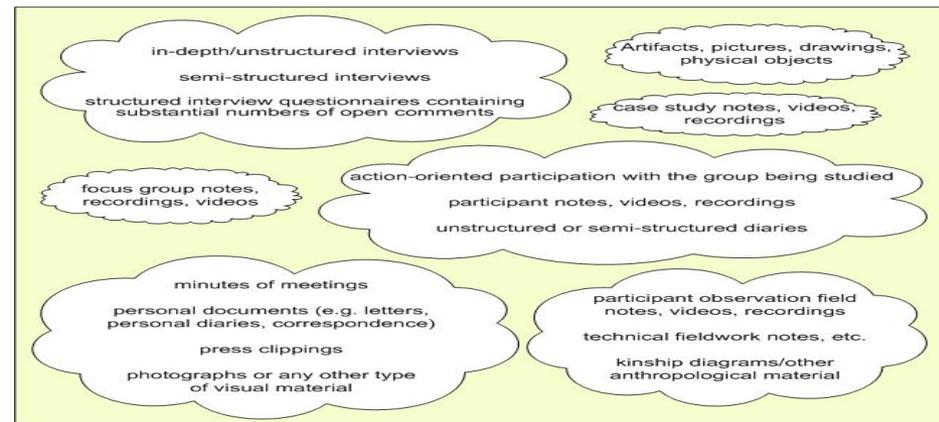
Quantitative methods

- Often preferred to *(dis-)prove presence of*:
- Cause, effect, other relationships (covariate, correlation, etc.)



Qualitative methods

- Often, preferred *to explore*
- How and why but not always, involves qualitative data



Educational design research can accommodate various...

Ontologies

(What is reality?)

- Objective
- Subjective

Epistemologies

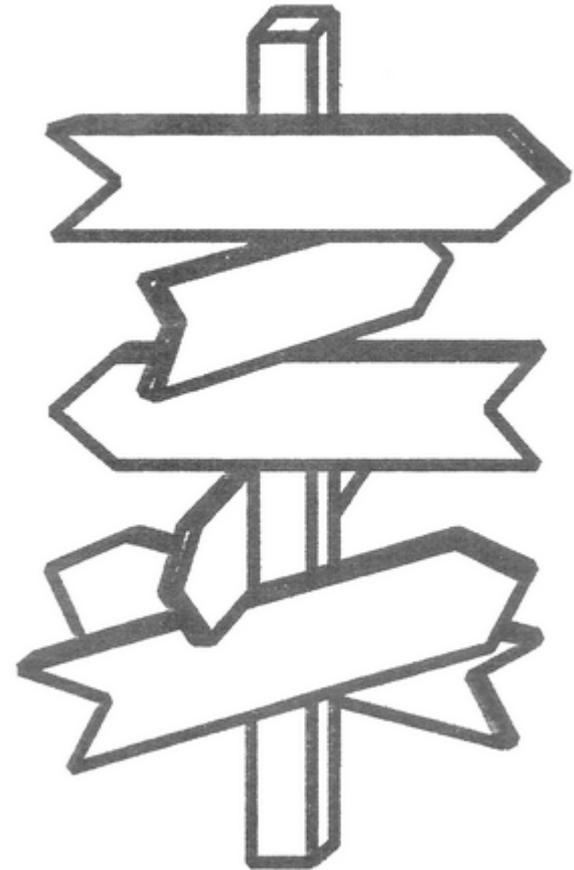
(What is knowledge?)

- Empirical observation
- Community-created insights

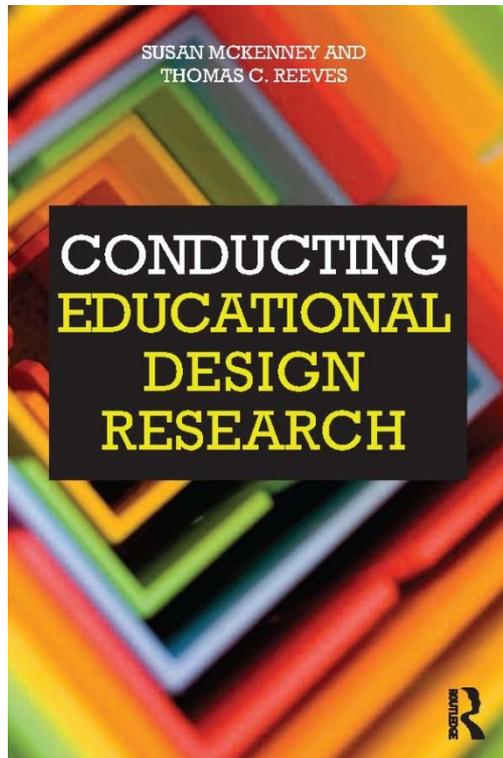
Methodologies

(How is research conducted?)

- Qualitative methods
- Quantitative methods



What is educational design research?



“...a **genre of research** in which the **iterative development of solutions** to practical and complex educational problems also provides the context for empirical investigation, which yields **theoretical understanding** that can inform the work of others.”

- *McKenney & Reeves, 2012*

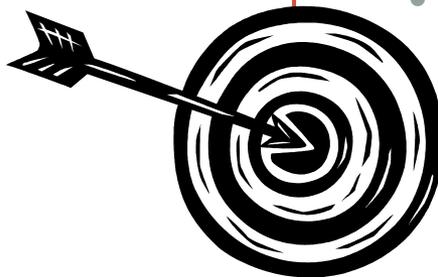
Goals of EDR

Solutions to real and complex problems (e.g.)

- Programs
 - Trainer development
- Processes
 - Learning model
- Products
 - Learning resources
- Policies
 - New organizational structures

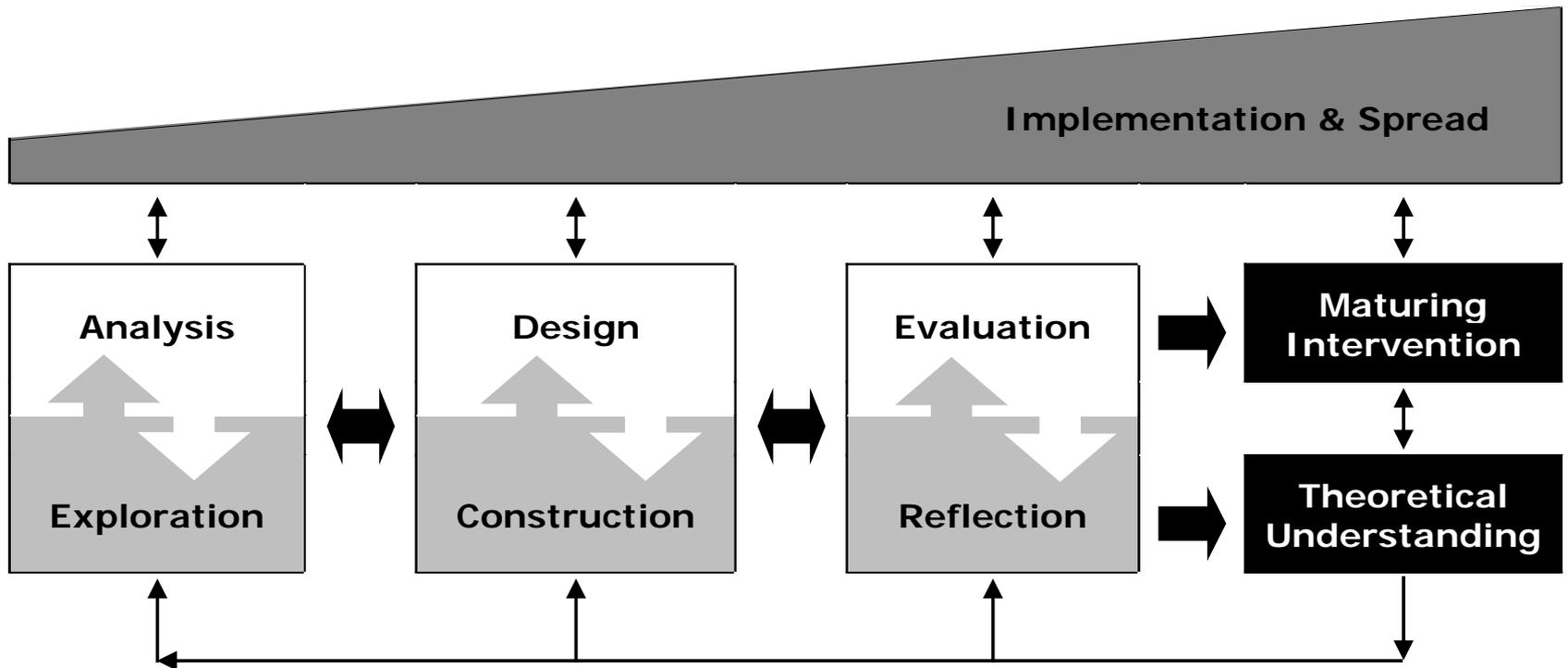
Scientific understanding (e.g.)

- Describe
 - What is present or happening
- Explain
 - Why things are such
- Predict
 - Cause and effect
- Prescribe
 - How to manipulate phenomena



Design research processes

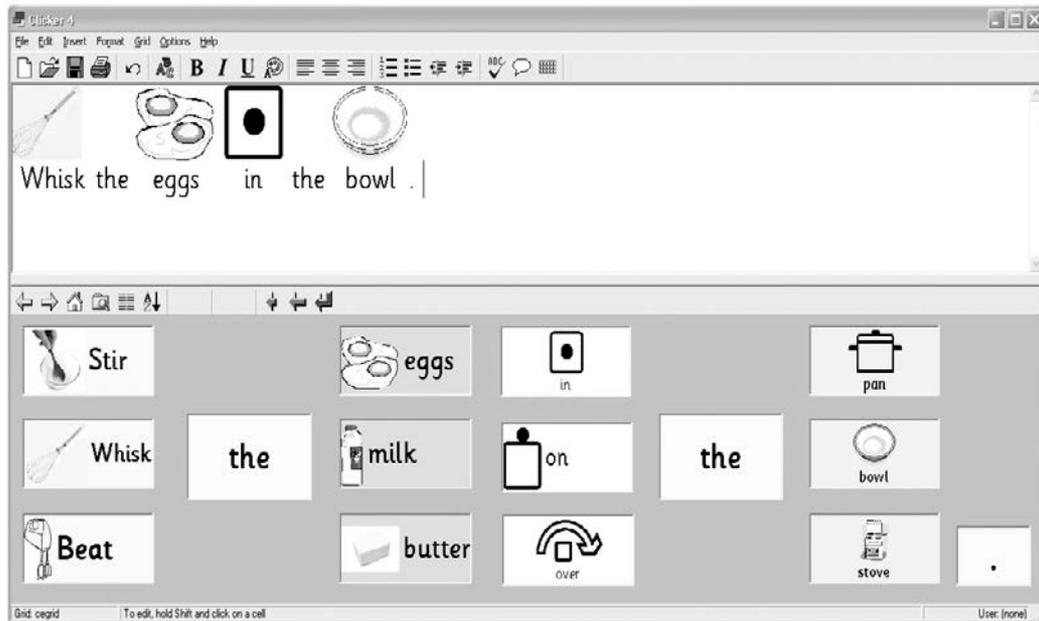
(McKenney & Reeves, 2012)



Learning innovation 1: Technology for early literacy



Learning innovation 1: Technology for early literacy



	Level	Local theory e.g. applicable to a few teachers, using multiple iterations of the same ICT-rich curriculum	Middle-range theory e.g. builds on local theories, applies to multiple schools using varied but similar ICT-rich curricula	High-level theory e.g. builds on middle-range theories, applies to many contexts using the same class of curricula
Purpose				
Describe e.g. how teachers implement ICT-rich curricula		Teachers integrate on-computer activities with off-computer activities to varying degrees	Higher degrees of integration are found in schools where teachers co-design the activities	Curricular ownership is positively related to the level of technology integration
Explain e.g. why teachers behave as they do in implementing ICT-rich curricula		Teachers integrate on-computer activities with off-computer activities to varying degrees not only due to differences in knowledge, skills and attitudes about early literacy, but also because of their perceived role as nurturers first, and educators second	Teachers value and prioritize certain aspects of early literacy (e.g. vocabulary and comprehension; technical (pre-) reading and writing; communicative functions of language) in different ways, often because of different pre-service education and/or school cultures	Kindergarten teachers tend to limit new initiatives in the classroom (even if they support them) until a safe, trusting, routine and predictable classroom climate has been firmly established
Predict e.g. which level of involvement in ICT-rich curriculum design is needed to sufficiently improve enactment and thus pupil learning		Teachers designing curriculum materials will be more likely to implement them, but may not be up to the task (due to lack of time, expertise, interest)	Personal interest (not time, remuneration, expertise or authority) most powerfully determines which teachers will prefer higher levels of design involvement	If well-structured, even modest degrees of design involvement will foster curricular ownership, which facilitates implementation
Prescribe e.g. how to facilitate collaborative design of ICT-rich curriculum for optimum integration and thus learning		Scaffolding teacher planning of the design process helps participants focus more creative effort on the design task, without stifling ownership of the product	Provide teachers in different contexts need-based variation in expertise and support; together with teachers, identify and define areas of freedom	Provide tailored support to build teacher understanding and endorsement of core ideas; encourage freedom and creativity to develop different manifestations of those core

Learning innovation 2: Para-educator professional development

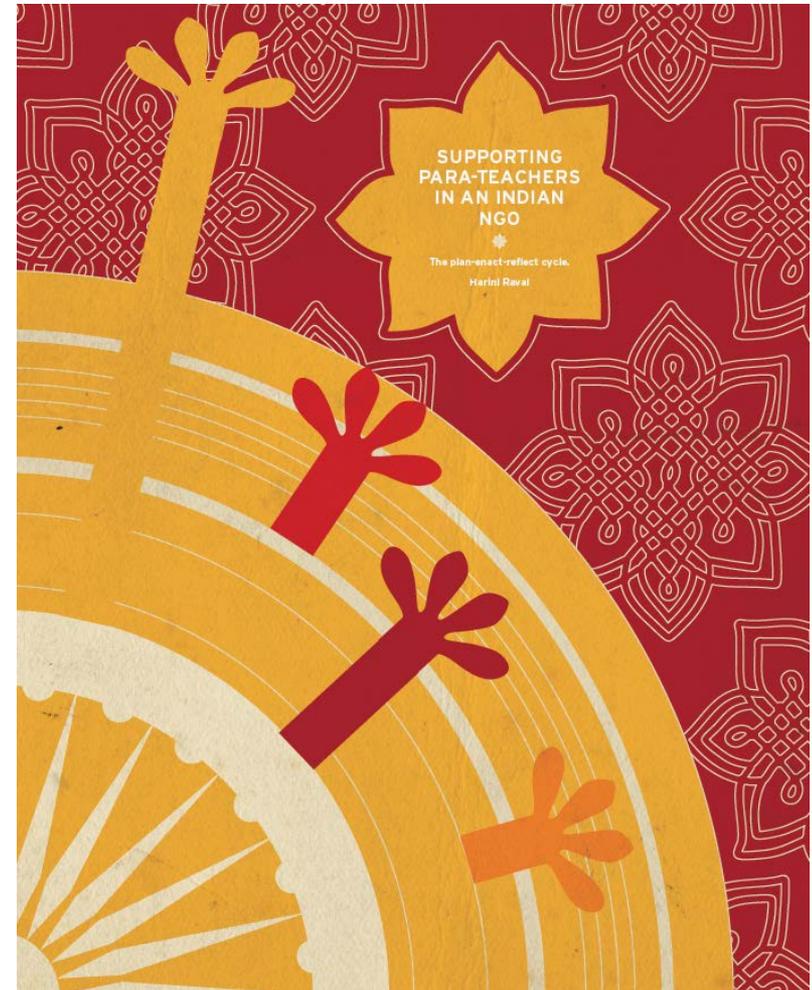
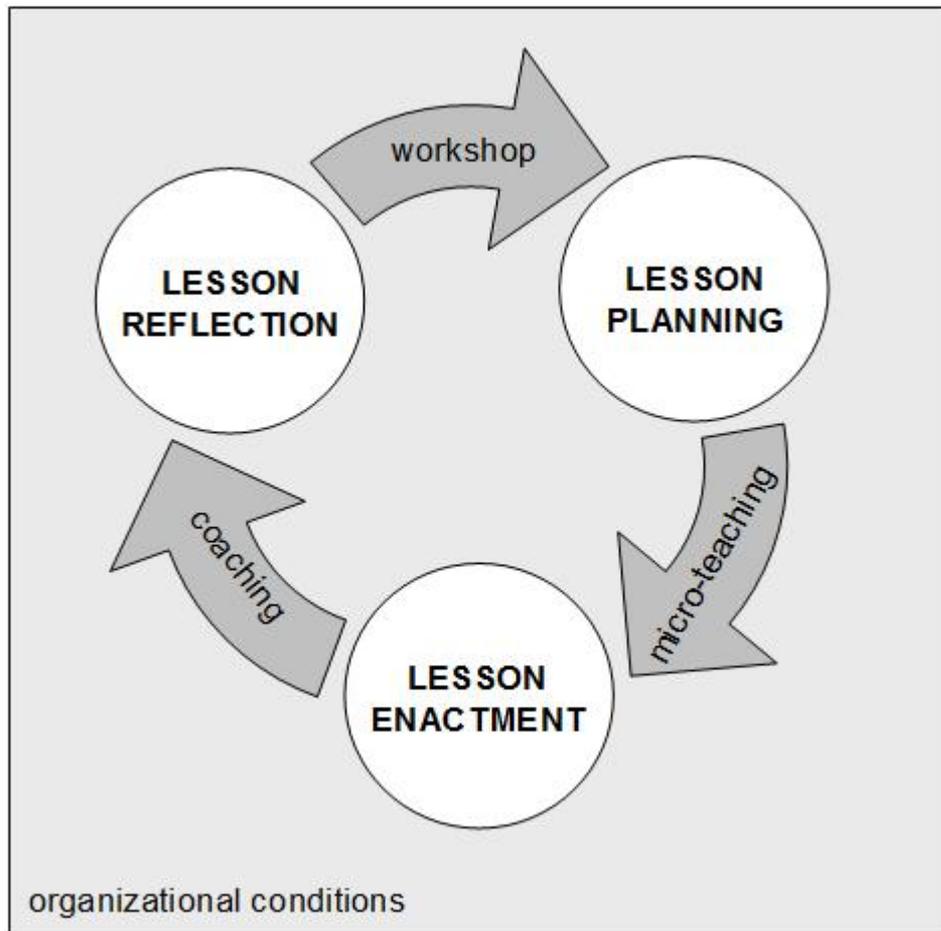


Learning innovation 2: Para-educator professional development

Analysis & Exploration	Design & Construction	Evaluation & Reflection
Learning needs and context analysis;	Design 1 evaluation (pilot)	Impact evaluation 24 months support subsided
Design framework underpinning professional development program	Design 2 evaluation (institutionalization) Design 3 evaluation (summative)	Systematic reflection to distill design heuristics
<ul style="list-style-type: none">- Management interviews- Teacher interviews- Classroom observations- Literature review	<ul style="list-style-type: none">- Document review- Self-reporting- Teacher interviews- Management interviews- Pupil pre/post tests	<ul style="list-style-type: none">- Structured self-report- Classroom observation- Pupil pre/posts tests- Teacher interviews- Management interviews

- 7 sub-studies (white boxes)
- Research methods per phase (grey boxes)

Learning innovation 2: Para-educator professional development



Learning innovation 3: Corporate and higher education cooperation

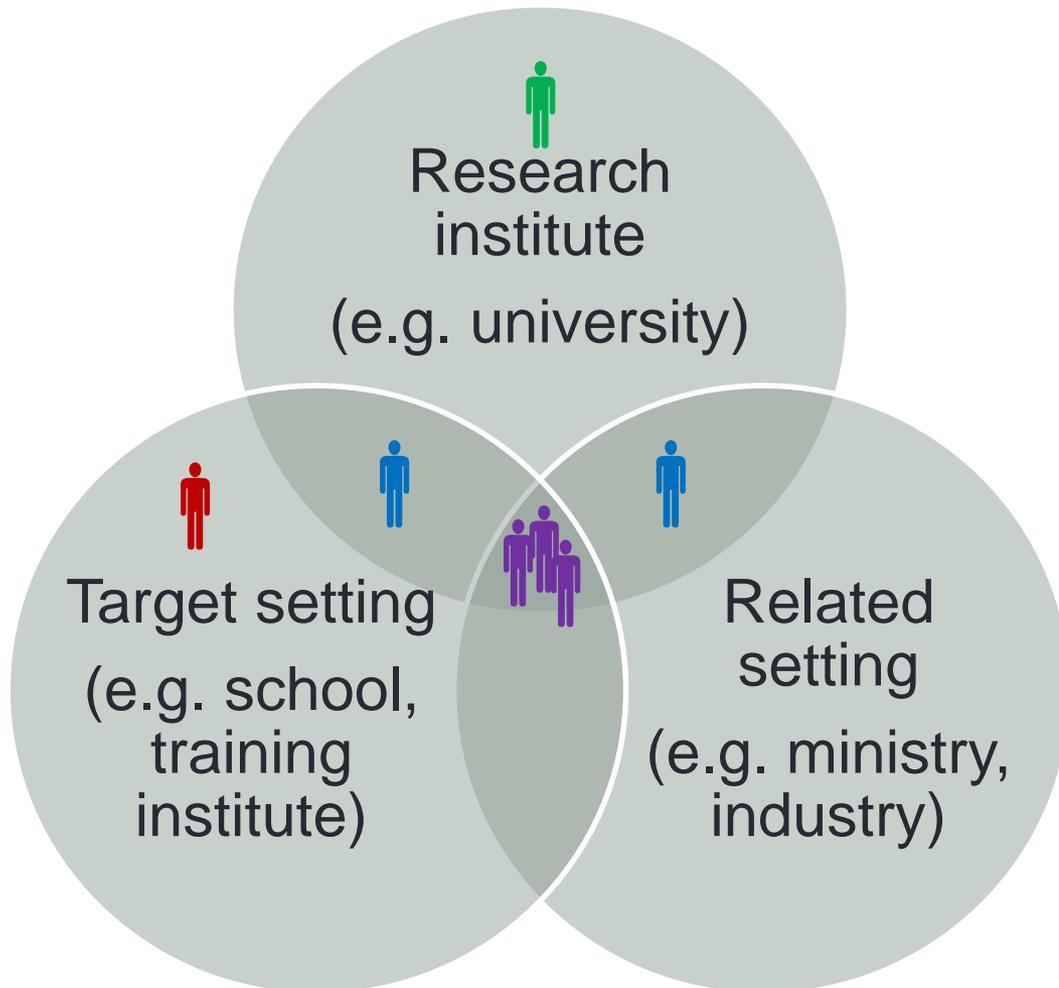


Learning innovation 3:

Corporate and higher education cooperation

- Teams of workplace learning (intern) mentors from the field together with higher education teachers
 - Their focus: improving the quality of workplace learning
 - Analyze needs, design interventions, evaluate effects
- Our study: examines how such teams function and how to support them
 - Team phases: forming, storming, norming, performing
 - Team focus: mutual engagement, joint enterprise, shared repertoire
- Our data collected through:
 - Questionnaires, interviews, focus groups, discourse analysis

Modalities for engaging in design research cooperation



Common formal affiliations for design researchers

- Research institute external researcher(s) (e.g. MSc/PhD/PostDoc)
- Research institute internal researcher(s) (e.g. MSc/PhD/PostDoc)
- Teams & consortia
- Target setting in-house researcher(s) (is extremely rare given the goal of producing scientific understanding)

EDR & SCIL conference themes

- **Being:** Role models for design research?
 - *Dieter Euler*, Swiss Center for Innovations in Learning
 - *Jan van den Akker*, Institute for Curriculum Development, UTwente
 - *Chris Dede*, Harvard University
- **Knowing:** Key issues and solutions?
 - Research-practice collaboration is a strength and a challenge
 - Understanding the expectations and values of others and self is key
- **Doing:** Practices that have proven viable?
 - Visualizing, planning and discussing sub-studies within larger studies
 - Be(com)ing: organized, systematic, creative, empathetic, flexible

Ideas to take home?

Design research is a genre of scientific inquiry for

- Solving problems in practice, while simultaneously
- Generating scientific understanding that is (also) of value to others

Design research is

- **Theoretically-oriented:** existing scientific understanding as input; new scientific understanding as output
- **Interventionist:** solutions aim to transform practice
- **Collaborative:** researchers, teaching/learning practitioners
- **Responsively grounded:** emergent insights steer process
- **Iterative:** multiple cycles of analysis, development, investigation



Thank you!
For discussion beyond today...

Susan McKenney

www.EducationalDesignResearch.org

susan.mckenney@ou.nl

susan.mckenney@utwente.nl

UNIVERSITY OF TWENTE.

