TEACHERS AS DESIGNERS OF TECHNOLOGY ENHANCED LEARNING

ICLS PRE-CONFERENCE WORKSHOP

YAEL KALI

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ORNIT SAGY

WHY THIS WORKSHOP?

Research needed to understand:

- How teachers learn through design;
- How such activities may be supported; and
- How teacher involvement in design partnerships with researchers impacts:
    - The quality of the artefacts created;
    - Their implementation; and ultimately
    - Student learning

This workshop brings together researchers and practitioners interested in further exploring various TaD aspects.

ABOUT THE WORKSHOP

Four themes:

- How to support teacher-designers in their tasks
- Collaborative design as a form of professional development
- Participatory design
- Design cognitions

Workplan

- 9.00-10.00 Plenary sharing
- 10.00-10.30 Within theme discussions
    - 10.30-11.00 Break
- 11.00-11.30 Within theme synthesis & outlining joint work
- 11.30-12.30 Report back & plan next steps

Skype-IDs

Karen - kd.konings
Susan – susanmckenney
Yishay - yishaym

SUPPORTING TEACHER DESIGNERS

Supporting Practice, Integrating Research in Immersive Technologies nto Educational Designs

- Svihla, Kniss, Waldschmidt, Beining, Strawn & Hagerman

Teachers as Design Researchers

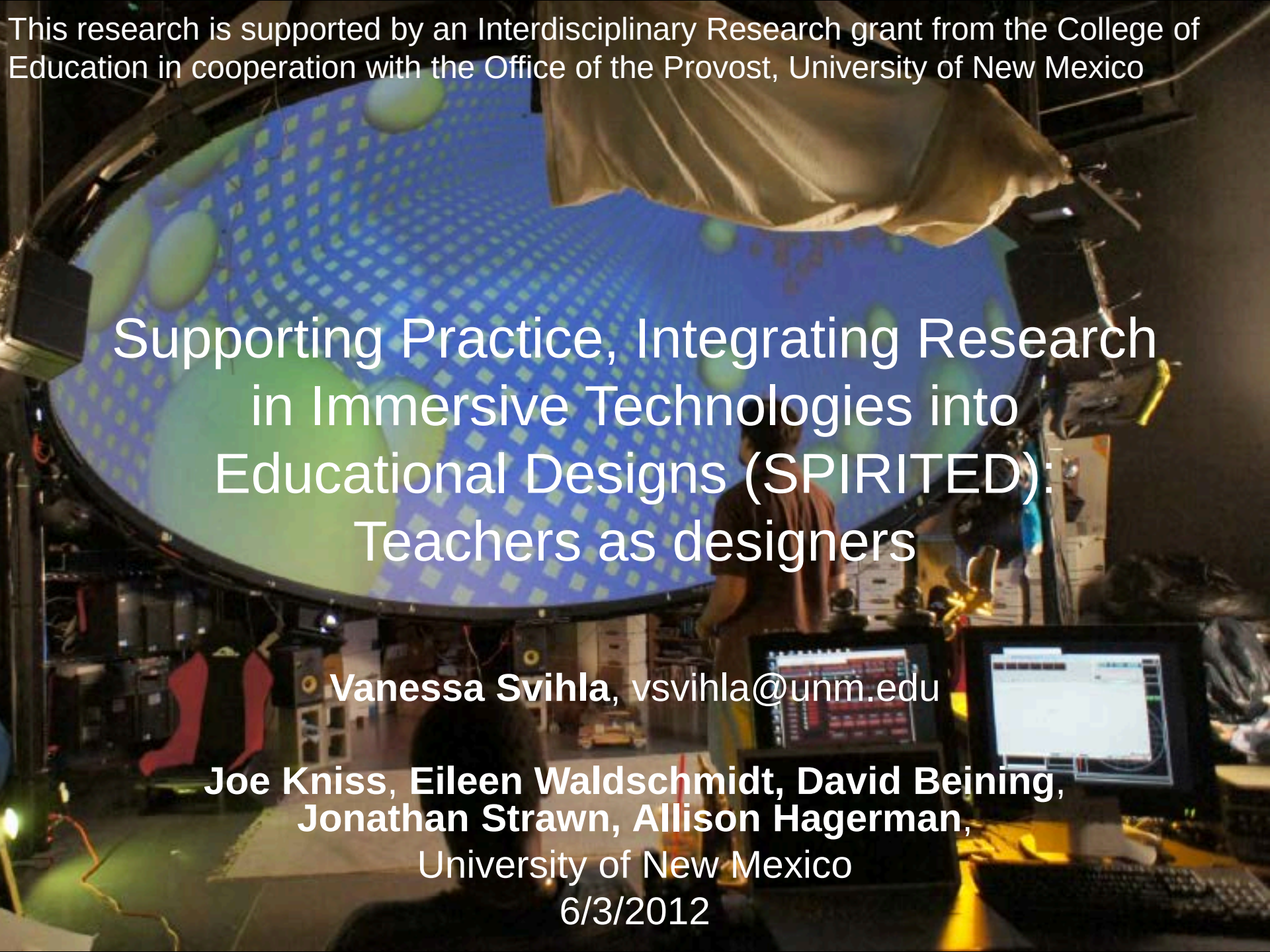
- Sagy & Kali

The Learning Design Studio: A Design Inquiry Approach to Teacher Training in TEL

- Mor

SVIHLA, KNISS, WALDSCHMIDT, BEINING, STRAWN & HAGERMAN

This research is supported by an Interdisciplinary Research grant from the College of Education in cooperation with the Office of the Provost, University of New Mexico



Supporting Practice, Integrating Research in Immersive Technologies into Educational Designs (SPIRITED): Teachers as designers

Vanessa Svihla, vsvihla@unm.edu

Joe Kniss, **Eileen Waldschmidt, David Beining**, **Jonathan Strawn, Allison Hagerman**,
University of New Mexico

6/3/2012

how might teachers plan to incorporate immersive, interactive projection into their designs?

- teachers struggle to think like designers (Reiser et al., 2000)
- authenticity and iteration help (Koehler & Mishra, 2005a, 2005b; Koehler et al., 2004)
- design principles help (Bybee, 1997; Edelson, 2001; Schwarz & Gwekwerere, 2007)
- providing curricula to adapt + PD can help (Ball & Cohen, 1996; Connelly & Clandinin, 1988; Davis & Krajcik, 2005; Fishman, Marx, Best, & Tal, 2003; Schneider & Krajcik, 2002).

Design Dimension	*Components*
Design occurs under constraints.	Cost Regulations
Design involves form and function. A customer may select a design based on form, even if function is inferior.	Materials Style Ambiguity
Designs address diverse customer or client needs, some of which may be implicit.	**Roles** **Needs** **Implicit/False**
Design is an iterative process that requires evaluation and optimization across tradeoffs.	Tradeoffs Improvement Coevolution

interdisciplinary project-based learning course, in-service teachers (n=9)

design tools: VOC, ideation, evaluation, prototyping

data: reflections, artifacts, pre/post tests

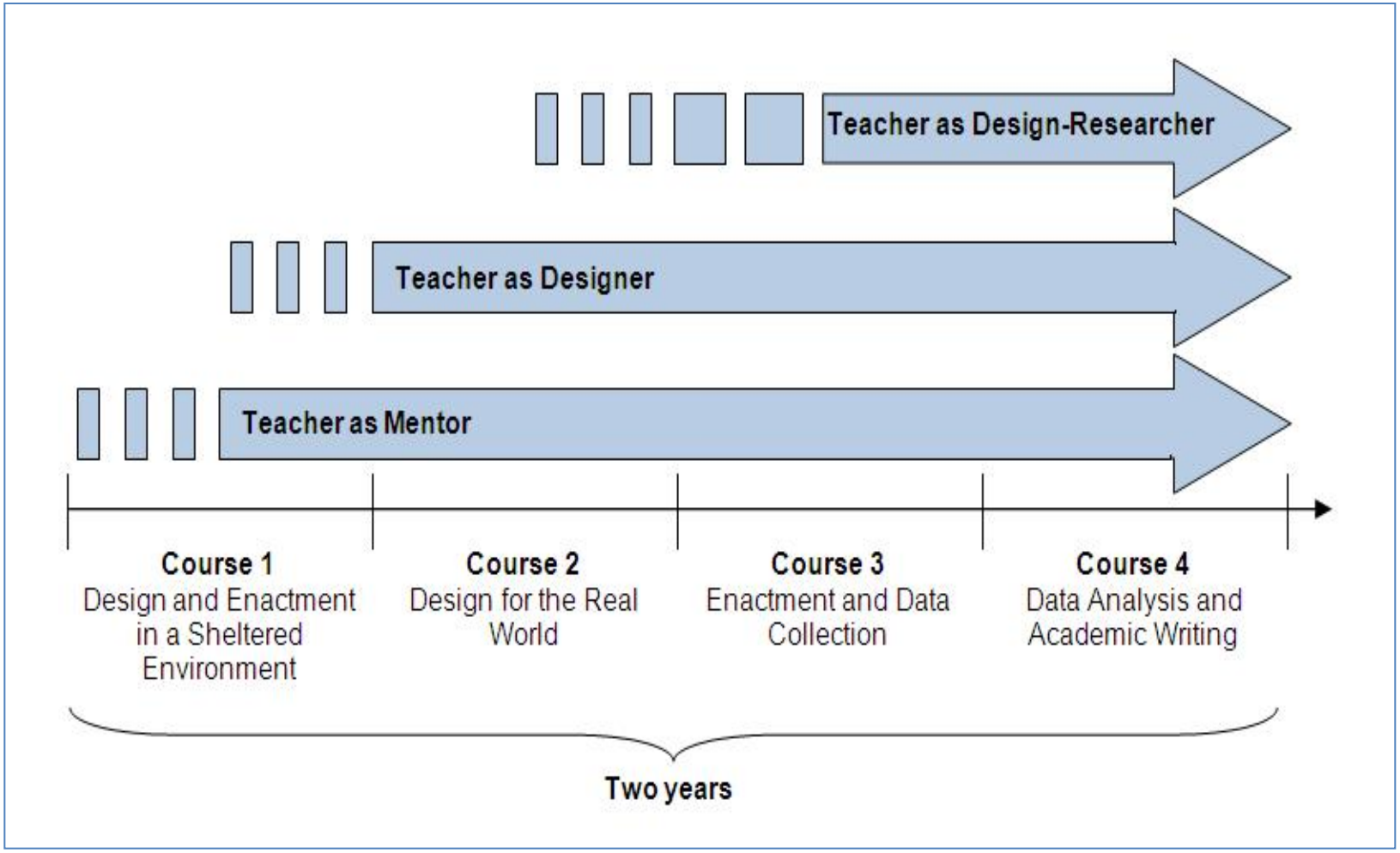
SAGY & KALI

Teachers as Design Researchers

Ornit Sagy and Yael Kali

Technologies in Education Graduate Program
University of Haifa

Experiencing three roles throughout the TaDR courses



Preliminary findings

- **Quality.**
  - Projects' quality rank high based on Shamir-Inbal et al.'s (2009) rubric
  - Evidence for a dramatic epistemological shift
- **Sustainability.**
  - Evidence for developing characteristics of a learning community (Bielaczyc and Collins ,1999)
- **Scalability.**
  - Advocators of innovative use of technology in education
  - Seven of the projects involve other teachers – either as teacher training (4) or coaching other teachers (3) who enacted the projects
  - Five teachers from the group were chosen by the ministry of education to serve as guides for other teachers in the "Adapting the Education System to the 21st Century" national program.

MOR

COLLABORATIVE DESIGN AS A FORM OF PROFESSIONAL DEVELOPMENT

Collaborative Design (CODE) as a Teacher Professional Development Model in Francophone and Anglophone Quebec

- Laferrière & Breuleux

A Framework for Studying Teacher Learning by Design

- Voogt, McKenney, Janssen, Berry, Kicken & Coenders

LAFERRIÈRE & BREULEUX

Collaborative Design and Teacher Professional Development (TPD-CODE)

Thérèse Laferrière, Laval University, Quebec, Canada
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Alain Breuleux, McGill University, Quebec, Canada
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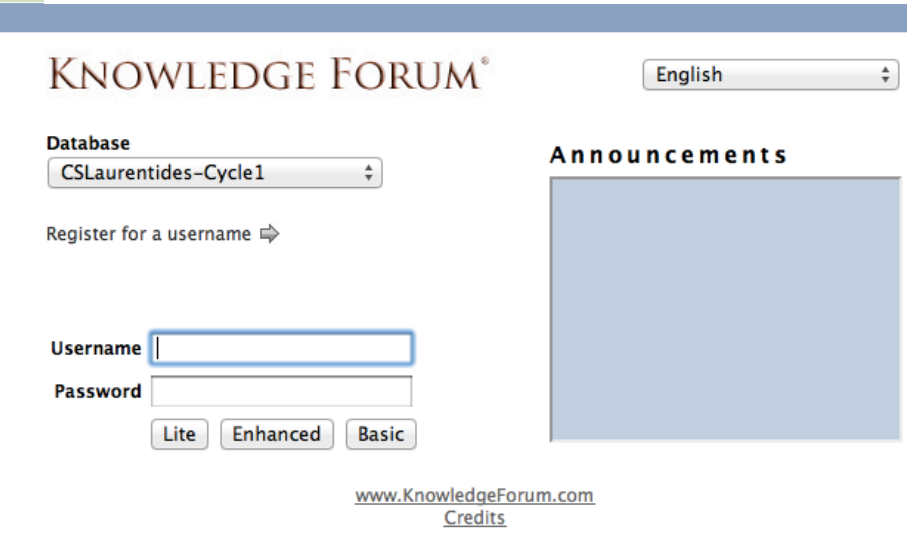
The case/concept

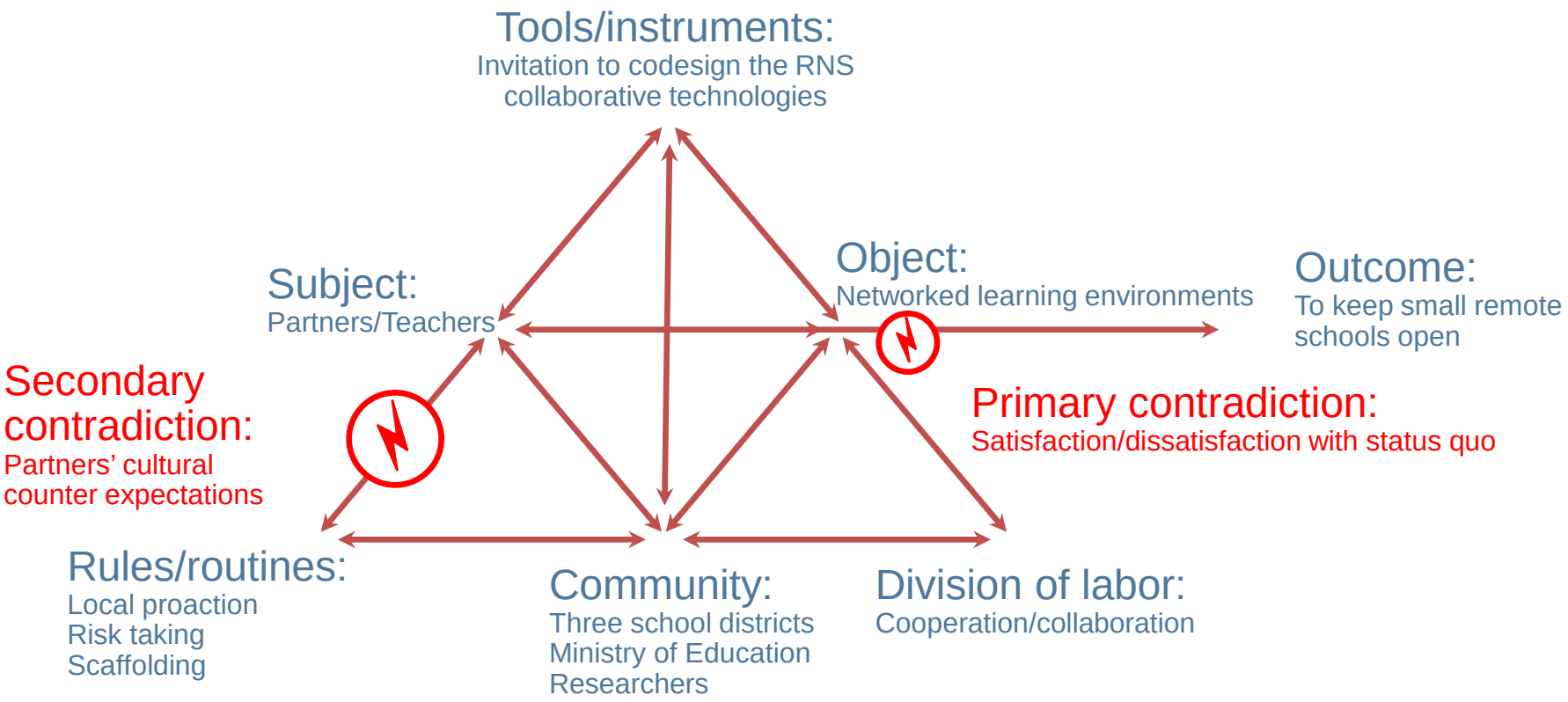
École éloignée en réseau (ÉÉR)

Remote Networked School (RNS)

24 school districts
Over 100 schools

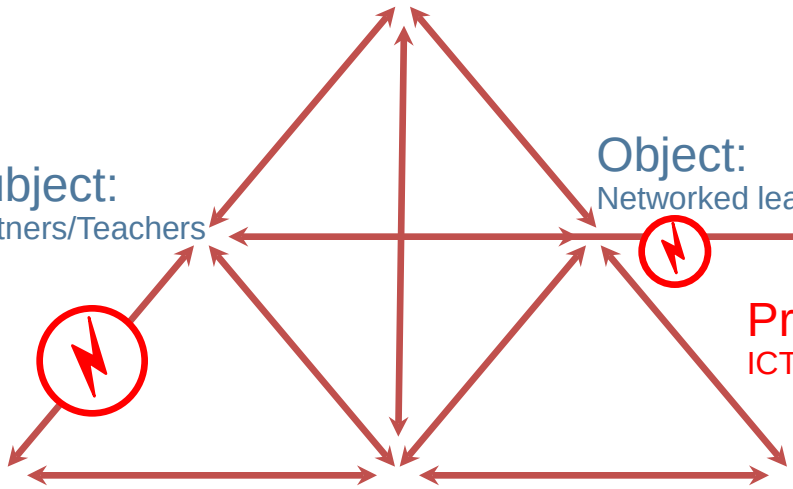


CODE of networked learning environments activity system (2002)



Source: Engeström, Y. (1987). Learning by expanding: An activity-theoretical approach to developmental research. Helsinki: Orienta-Konsultit. (available online at: http://lchc.ucsd.edu/MCA/Paper/Engestrom/expanding/toc.htm)

CODE of networked learning environments activity system (2012)



Tools/instruments:
Concepts, collaborative technologies, artifacts, baseline data

Subject:
Partners/Teachers

Object:
Networked learning environments

Outcome:
Sustainability/scalability of the RNS innovation

Secondary contradiction:
Partners' cultural counter expectations

Primary contradiction:
ICT integration/RNS concept

Rules/routines:
Multi-tasking and rotation
Cooperative learning practices
Networked learning activities
Collaborative inquiry
Accumulation and display of artifacts
Boundary spanning (e.g., KBIP)

Community:
Quebec Education Systems

Division of labor:
Cooperation/collaboration between schools and classrooms

Source: Engeström, Y. (1987). Learning by expanding: An activity-theoretical approach to developmental research. Helsinki: Orienta-Konsultit. (available online at: http://lchc.ucsd.edu/MCA/Paper/Engestrom/expanding/toc.htm)

VOOGT, MCKENNEY, JANSSEN, BERRY, KICKEN & COENDERS

A Framework for Studying Teacher Learning by Design

Teacher learning by design

- Teacher learning needs to be:
  - Meaningful to one's own practice
  - Social, distributed – not always formalized
  - Content-oriented
  - Connected to real-world examples
  - Collaborative
  - Stretched over the long term, including follow-up support
  - Aligned with teachers' own goals
- Teacher design team work can address such needs

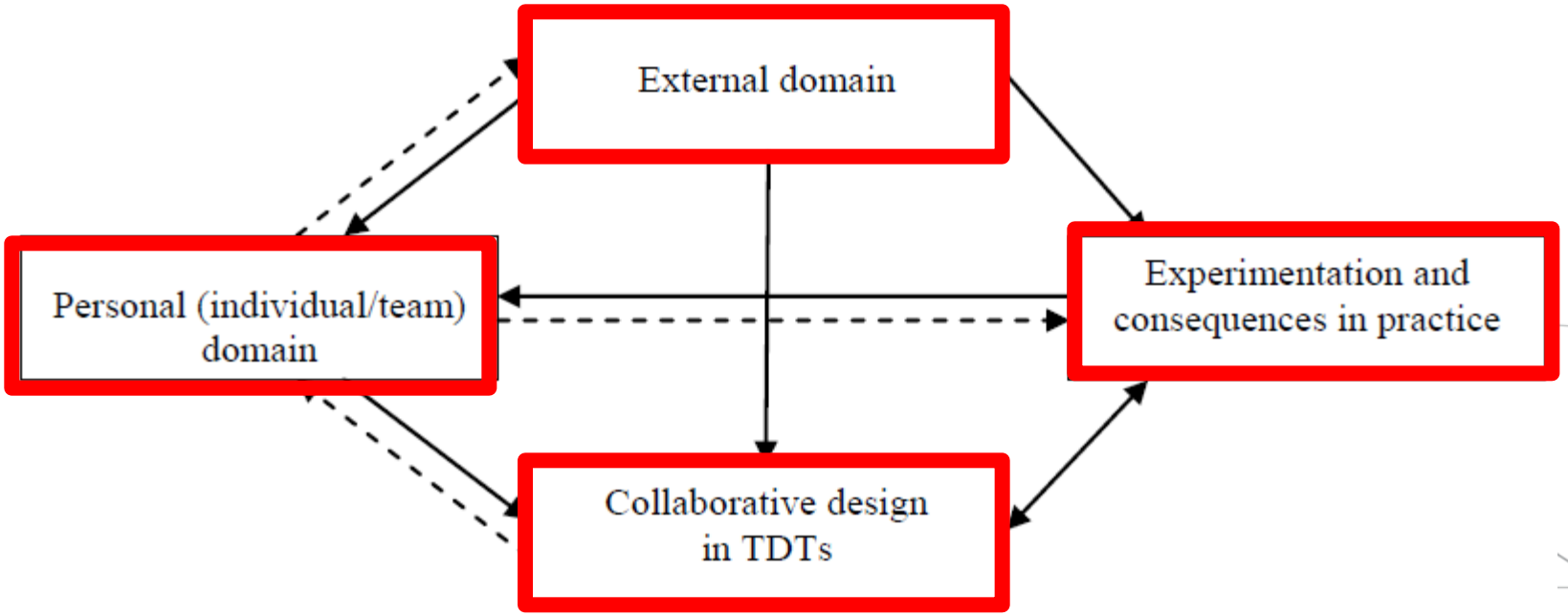
How to measure teacher learning by design?

- Study teacher design teams
  - Process indicators (e.g. teacher attitudes)
  - Outcome indicators (e.g. pupil learning)
  - Complex relationships between indicators, different for individuals

- Clarke & Hollingsworth (2002) Interconnected Model of Professional Growth: 4 domains
  - The personal domain: teacher knowledge, skills, attitudes and beliefs
  - The domain of practice: professional experimentation, inside and outside the classroom
  - The domain of consequences: outcomes of new practices
  - The external domain: offers sources of information, stimuli and/or support

Interconnected Model of Professional Growth *through design teams*

Adapted from Clarke & Hollingsworth (2002) for learning by design



PARTICIPATORY DESIGN

Workshop ICLS: Teachers as designers of technology-enhanced learning materials

- Konings

A Participatory Approach in the Design of Mobile Learning Trail and Resources

- Tan & So

Designing Smart Classroom Technologies with Teachers: Creating Opportunities for Collaboration and Innovation

- Cober, Madeira, Fong & Slotta

KONINGS

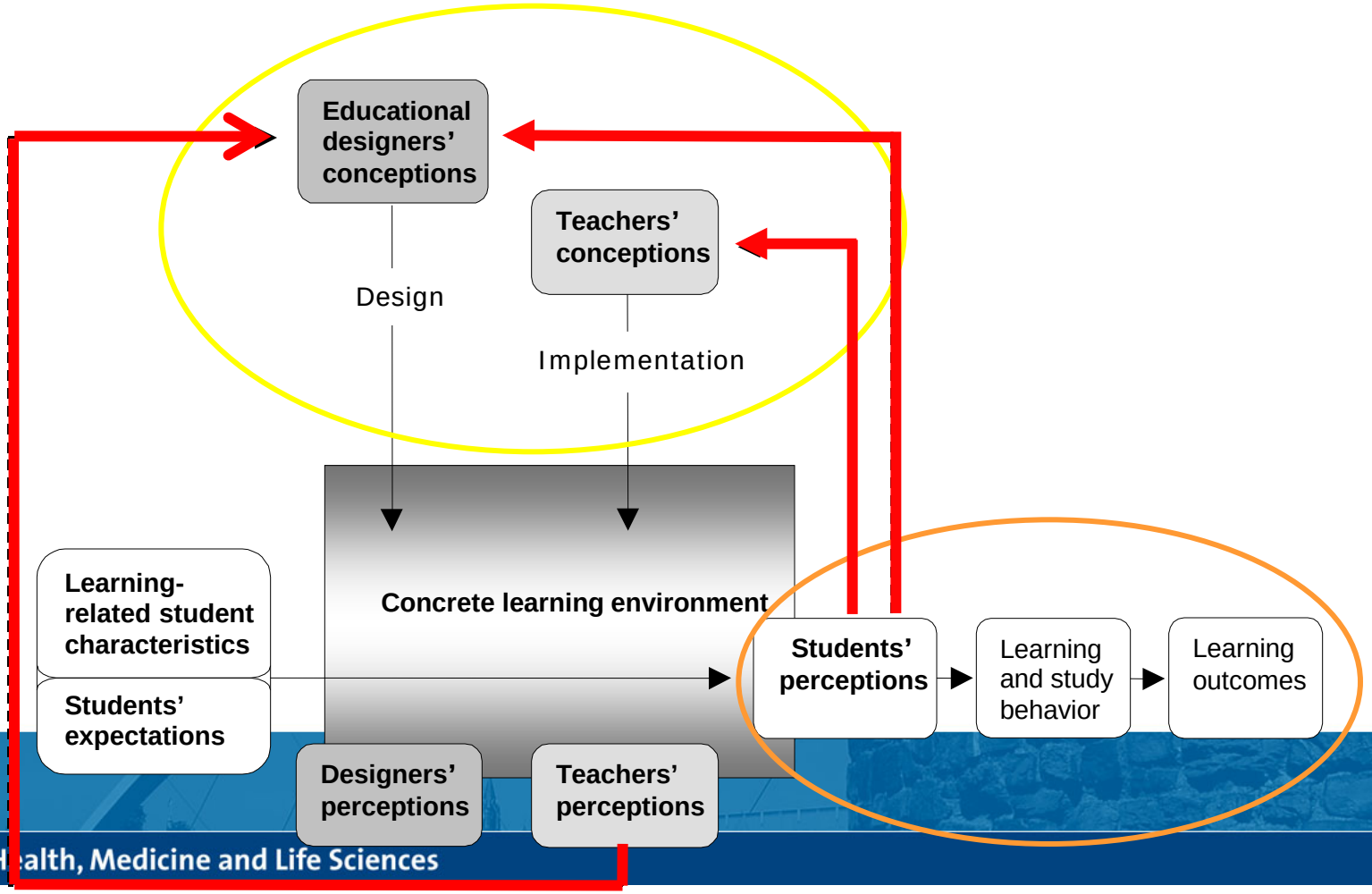
Participatory Design as a tool for combining perspectives of different stakeholders in instructional design

Dr. Karen D. Könings
Dept. Educational Development & Research

Faculty of Health, Medicine and Life Sciences

Universiteit Maastricht

The Combination- Of - Perspectives (COOP) model



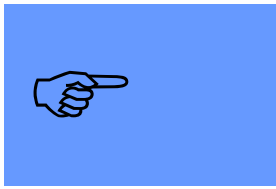
Könings, Brand-Gruwel, & van Merriënboer (2005). *British Journal of Educational Psychology, 75*(4), 645-660.

Participatory design meeting

Teacher and 7 students (+moderator)

- Brainstorm about current lessons
- Groupsdiscussion about positive/negative aspects

- Suggestions for improvement → action points



- More examples out of daily life
- Stimulate students to explain to each other
- Procedure for solving difficult tasks
- More practice of speaking skills
- Self-directed learning: time planning, help seeking and practical issues

Effects of participatory design on different stakeholders

	Perception	Dissatisfaction	Agreement	Appreciation of lessons	Degree of implementation
Teachers	☺	☺			
Co-designers	☺	☺	☺	☺	☺
Rest of the class		☹			

TAN & SO

A Participatory Approach in the Design of Mobile Learning Trail & Resources

Research Project: Mobile Learning Activities to Foster Critical Thinking

& in Situ Knowledge Building in Integrated Humanities.

A Participatory Approach

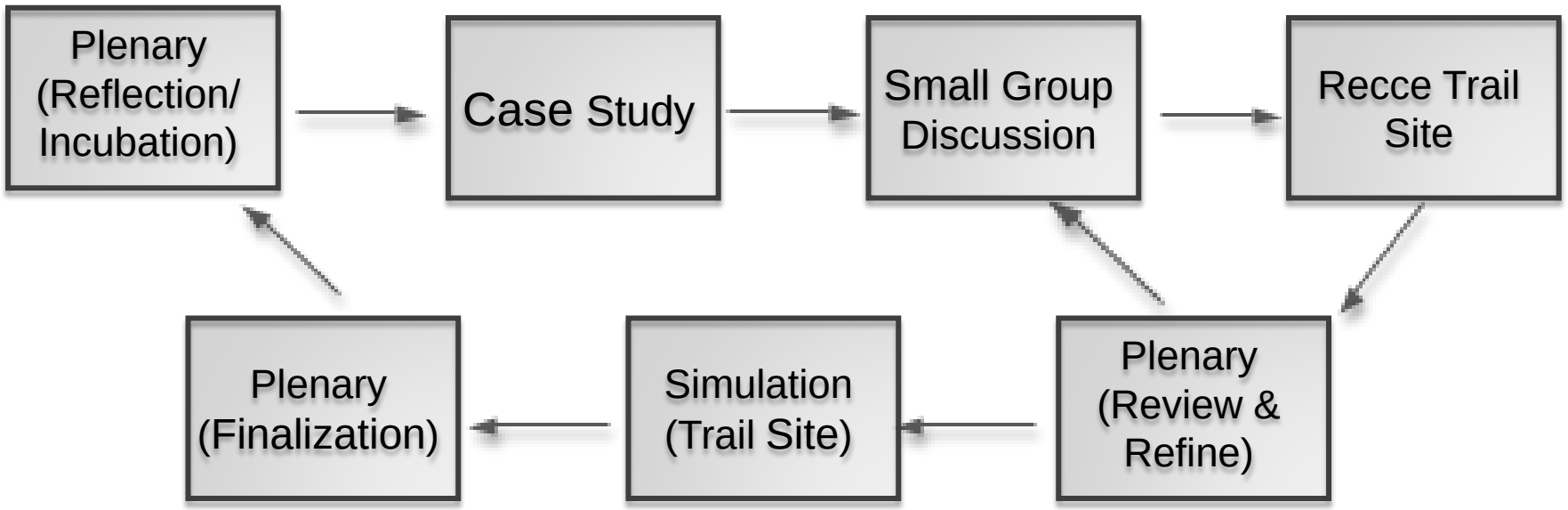
Purpose: Aligns with Design-based Research Methodology & Reflective Practice for Teacher Professional Development.

Process: Collective Planning, Execution & Evaluation in Trail & Resource Design. (Researchers + Teachers + Software Engineers).

Esther Tan & Dr. So Hyo-Jeong

Learning Sciences Lab

The Treatment of a Participatory Approach



Case Study - to discuss integration of topics & adaption of KB pedagogy for the Asian classroom practices.

Recce - to obtain a contextual understanding of the practices of knowledge building & the rich physical affordances of the learning space.

Simulation - to perform a dry-run of actual trail, simulation of technology-mediated cognitive tools & facilitation process.

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Design Framework for Mobile Learning Trail

The Three-pronged Approach (F.A.T)
(Tan & So, 2011)

✓ Activity Design

➡Context

Authenticity & Transfer (physical affordances)

Everyday Cognition

➡Content

Content Diversity & Transfer

Structured & Unstructured Engagement

✓ Facilitation (face2face & virtual)

➡Scaffolding

➡Collaborating etc.

✓ Technology

➡Cognitive Tools & Resources

➡Online Platform

Learning Sciences Lab

COBER, MADEIRA, FONG & SLOTTA

UNIVERSITY OF TORONTO
OISE | ONTARIO INSTITUTE
FOR STUDIES IN EDUCATION

Designing smart classroom technologies with teachers: Creating opportunities for collaboration and innovation

Rebecca Cober, Cheryl Madeira,
Cresencia Fong, and James D. Slotta

Design Goals

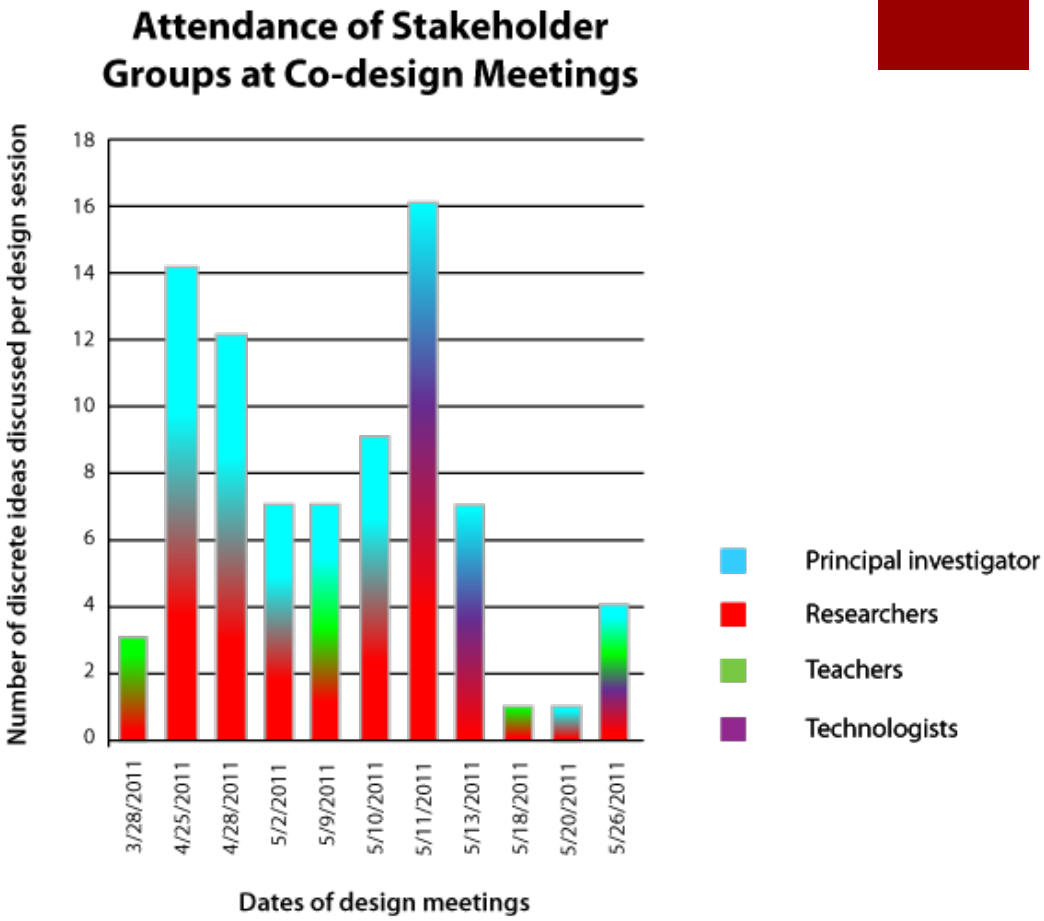
- Curricular Design: Embedded Phenomena (Moher, 2006)
- Pedagogical Design: Knowledge Community and Inquiry (Slotta, 2007)
- Methodology: Co-design effort (Roschelle, Penuel, Shechtman, 2006)

Research Questions

- How can teachers work effectively with diverse disciplinary groups?
- How successful was our methodology towards fostering a sense of inclusion among our teachers?
- How sensitive is co-design to fluctuations in the attendance of different stakeholder groups, including teachers who cannot be present at all meetings?

Discussion

- Role of teachers in the co-design effort
- Fostering a session of inclusion among teachers
- Sensitivity of the design process to fluctuations in attendance
- Future work



DESIGN COGNITIONS

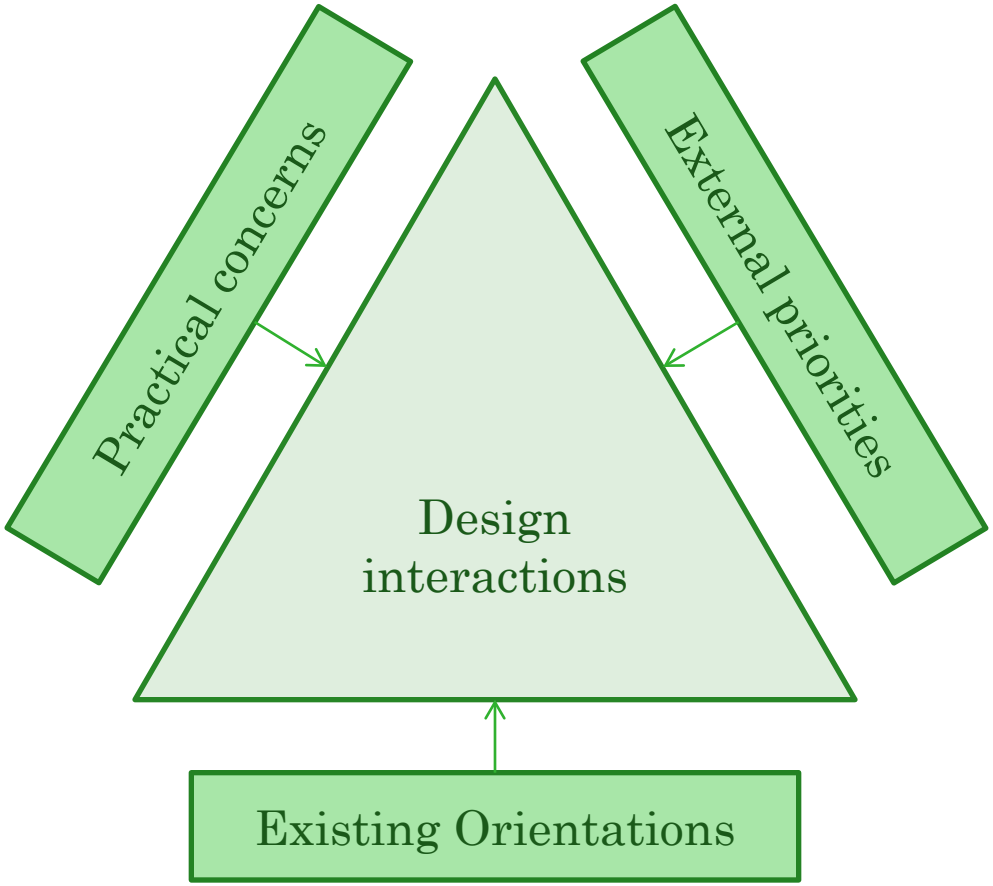
Teachers' Intuitive Approaches to Curriculum Design: Understanding Decision-making while Creating ICT-rich Learning Activities for Early Literacy

- McKenney, Voogt & Boschman

MCKENNEY, VOOGT & BOSCHMAN

Teachers' Intuitive Approaches to Curriculum Design: Understanding Decision-Making while Creating ICT-rich Learning Activities for Early Literacy

Theoretical framework



Methods

RQ1: Existing orientations (technology, pedagogy, early literacy)

- **Procedure:** semi-structured interview, videotaped and transcribed
- **Analysis**
  - First: Knowledge, beliefs & practices regarding: T, P, EL;
  - Second: Refinement, categories within T, P, EL:

RQ2: Design interactions

- **Procedure:** 3 teams, 1 design task, audio/video taped, discourse analysis
- **Analysis**
  - Macro/episode: brainstorm, issue, report, explication
  - Micro/utterance: problems, proposals, arguments, instances

RQ3: Design reasoning

- **Procedure**: using the same discourse data set described above
- **Analysis**
  - Practical concerns, Existing orientations, External priorities.

Results

Existing orientations

- **Technology:** concrete material is more appropriate, individual use of software without teacher support, computers are part of learning-material, use of digital whiteboard and digital storybook
- **Pedagogy:** classroom management, children's socio-emotional development, collaboration with peers.
- **Early literacy:** concepts explained as activity (we do…), purpose of early literacy

Design interactions

- **Macro:** most episodes are brainstorm, contain most single lines.
- **Micro:** problem is not 'resolved', one problem is replaced by another.

Design reasoning

- **Practical concerns:** focus of regular teachers, mostly on organization of activity.
- **Existing orientations:** difference between language experts and regular teachers.
- **External priorities:** no problems are coded as external priorities, only instances.

WORKING SESSION 1: MEET YOUR THEME TEAM

- What does this theme mean to you? How does it relate to your (anticipated) work? Why do you think it is interesting/relevant?
- What issues did you note in the presentation(s) that were new, interesting, innovative?
- What gaps in the literature can you identify? How might these be addressed?

CONTINUING DISCUSSIONS

Explore thematic issues, incl divergence and convergence. Within theme synthesis and outlining joint scientific publications (e.g. in journal special issue)

- +/- 3 ideas that you agree on as interesting/relevant and connects your work (convergence)
- +/- 3 ideas where perspective differ/discussion warranted (divergence)
- +/- any unique ideas worth highlighting (could be areas of divergence, convergence or other)

Ideas put onto theme group page; possibly relationships between ideas shown in poster/map (could be photo/drawing tool - digital or analogue A2 map is fine); including possibilities for potential journal papers:

- Commentators: What would you like to read about?
- Contributors: How could you meet these needs?

PLENARY SHARING

LOOKING AHEAD