

# Professional learning communities, PLC. The case of Learning study

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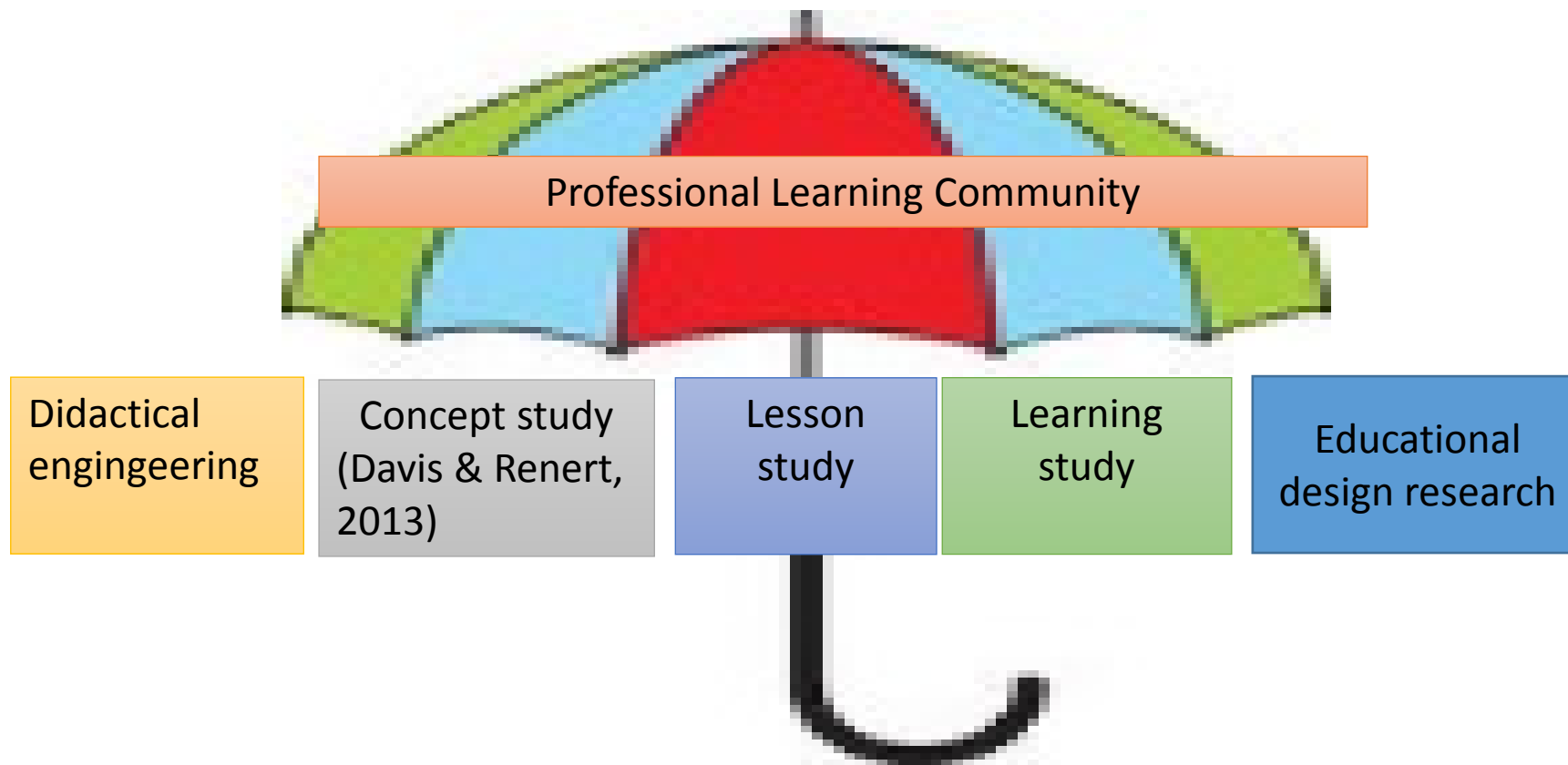


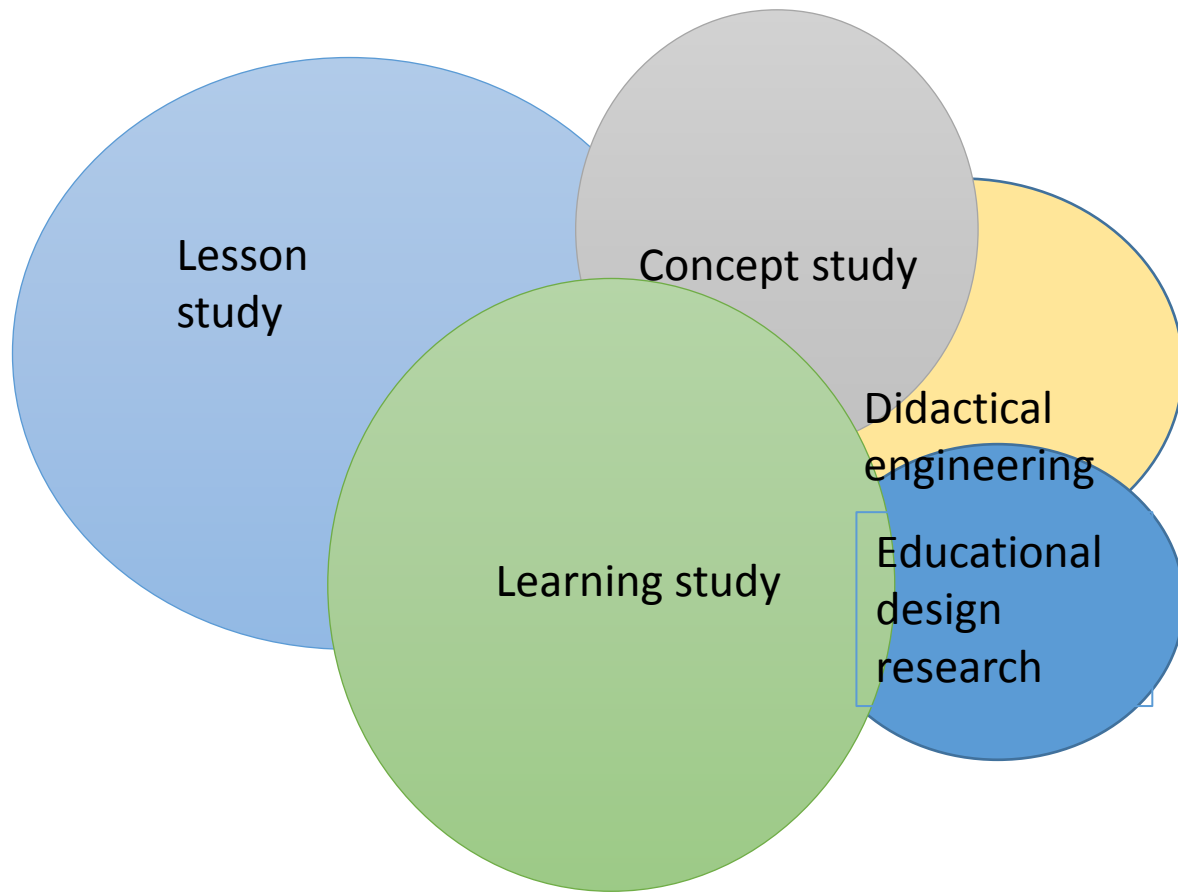
# Outline

- The landscape of PLC
- Learning study
- Bridging the theory – practice gap

## Definition (The National Commission on Teaching and Learning & America's future, 2010)

- Three or more
- Improving teaching
- Not short-term
- Student and teacher learning
- Shared visions, collaborative elements

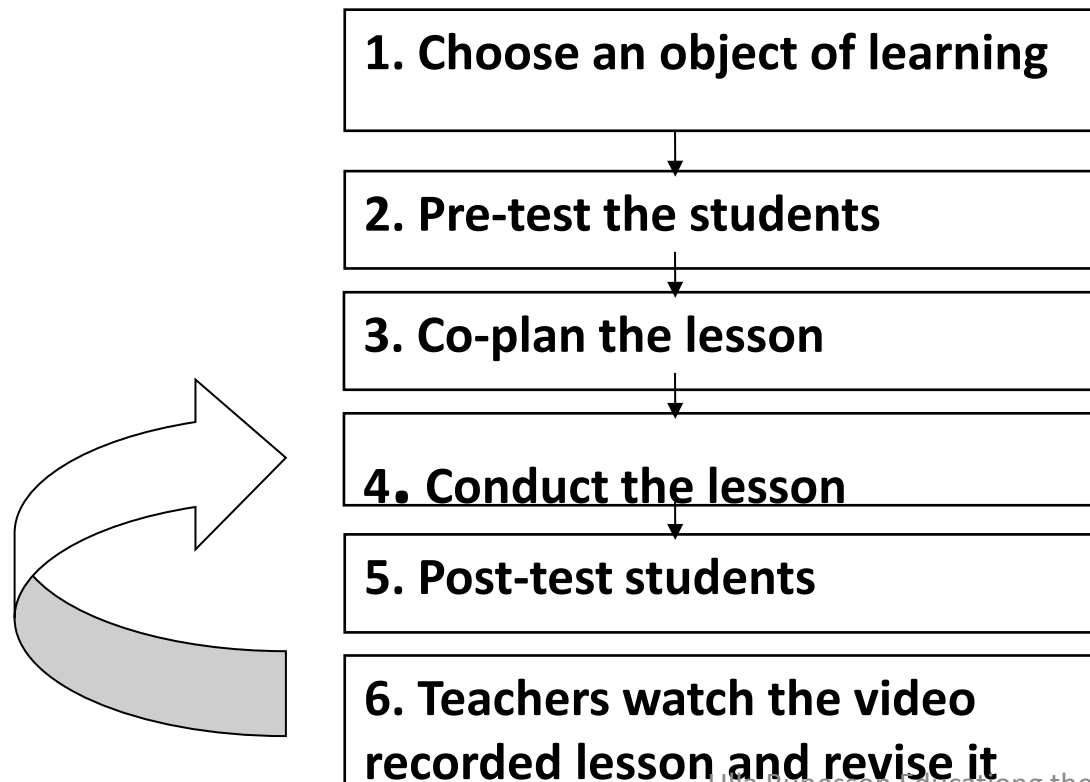




	Lesson study	Learning study
Observation classroom teaching and learning	x	x
Curriculum oriented	x	x
Learner oriented	x	x
Iterative	x	x
Content oriented	(x)	x
Theoretically framed	(x)	x
Systematic, triangulation of student and classroom data	(x)	x
The nature of the object of learning and its critical aspects		x

Learning study is framed within  
Variation theory (Marton & Booth, 1997; Marton, Runesson & Tsui, 2004;  
Marton, 2014)

**theory-based collaborative, iterative inquiry into teachers' own  
teaching practices with the focus on the object of learning**



# Learning objective (grade 3, The Swedish National Curriculum)

“Pupils [should] have a basic knowledge of natural numbers and can show this by describing interrelationships between numbers and also by dividing whole numbers”.

Not the object of learning

- What does it imply to describe interrelationships between numbers?  
What is it you have learned when you developed this capability?  
What do these particular learners have to learn in order to develop this capability?

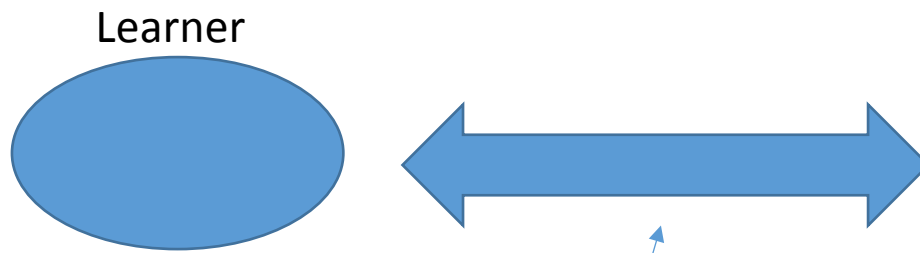


Variation theory (Marton & Booth, 1997; Marton, Runesson & Tsui, 2004; Marton, 2014)

Helping pupils to be able to e.g.

“describing interrelationships between numbers”

Implies to find *what must be learned, what is not learned yet* and how to *help them to discern* this.

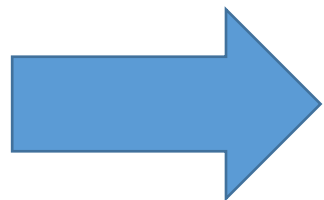


Learning objective:

describing interrelationships between numbers

For every capability and every group of learners there are certain things that must be learned. These are **the critical aspects**

Teachers' knowledge of the concept, common misunderstandings or best representations and examples are necessary - but not sufficient

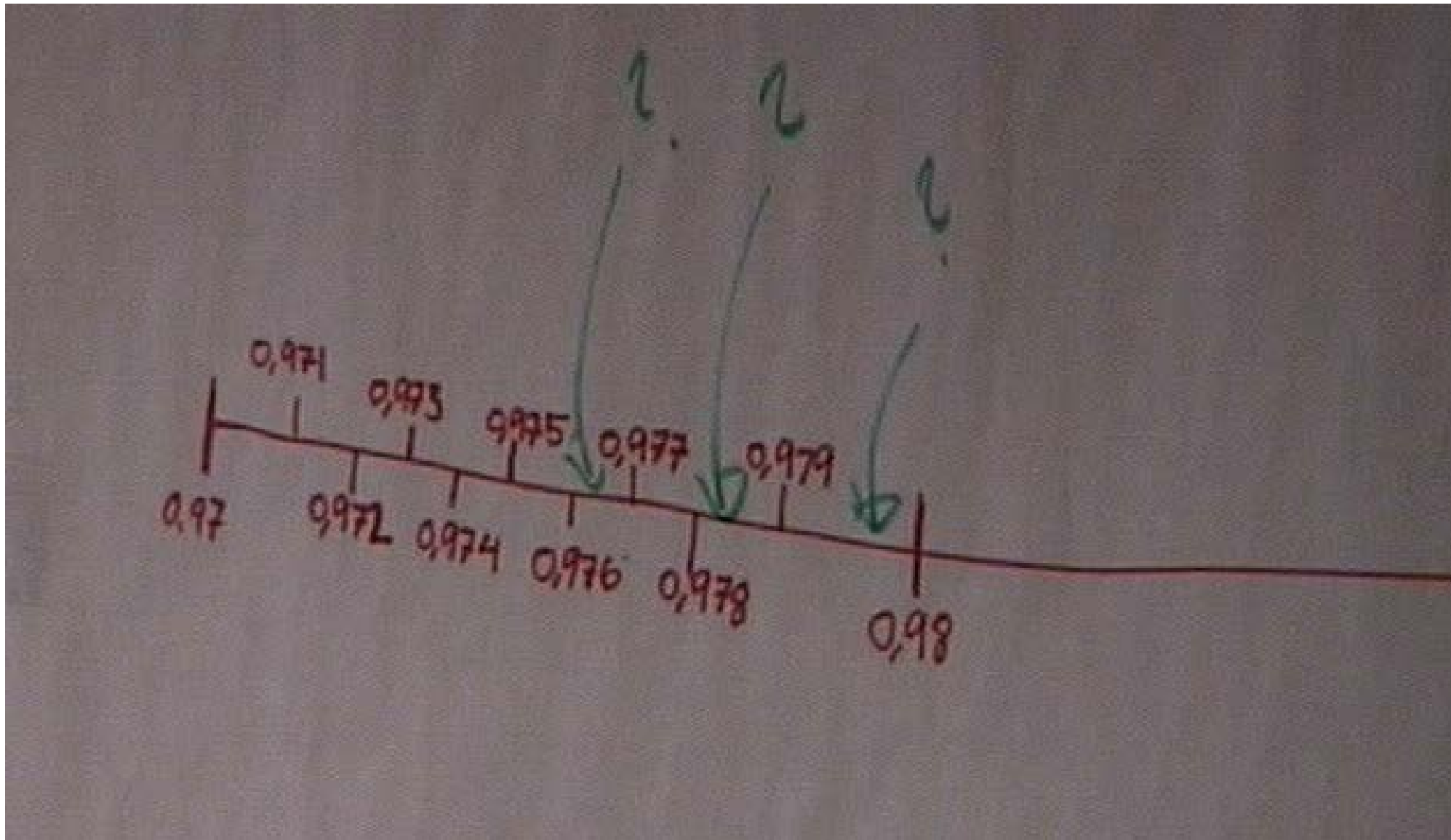


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Observation classroom teaching and learning	x	x
Curriculum oriented	x	x
Learner oriented	x	x
Iterative	x	x
Content oriented	(x)	x
Theoretically framed	(x)	x
Systematic, triangulation of student and classroom data	(x)	x
<b>The nature of the object of learning and its critical aspects and how to make them discernable</b>		x

Are there numbers  
between 0.97 and 0.98? If  
so, how many and why?

# Results before and after the lesson (Kullberg, 2010)

	Class A N=19	Class B N=17	
Are there decimal numbers between 0,97 och 0,98? <b>Pre-test</b> Many numbers /endless	<b>5% (1)</b>	<b>24% (4)</b>	
One number	21% (4)	29% (5)	
Ten numbers	0% (0)	0% (0)	
No numbers	42% (8)	18% (3)	
Other	32% (6)	29% (5)	
Are there decimal numbers between 0,97 och 0,98? <b>Pre-test</b> Many numbers /endless	<b>21% (4)</b>	<b>94% (16)</b>	
One number	0% (0)	0% (0)	
Ten numbers	47% (9)	6% (1)	
No numbers	21% (4)	0% (0)	
Other	11% (2)	0% (0)	



# What aspects of the object of learning were the critical aspects?

- The interchangeable representation
- The number as a part of a whole
- The divisibility of parts

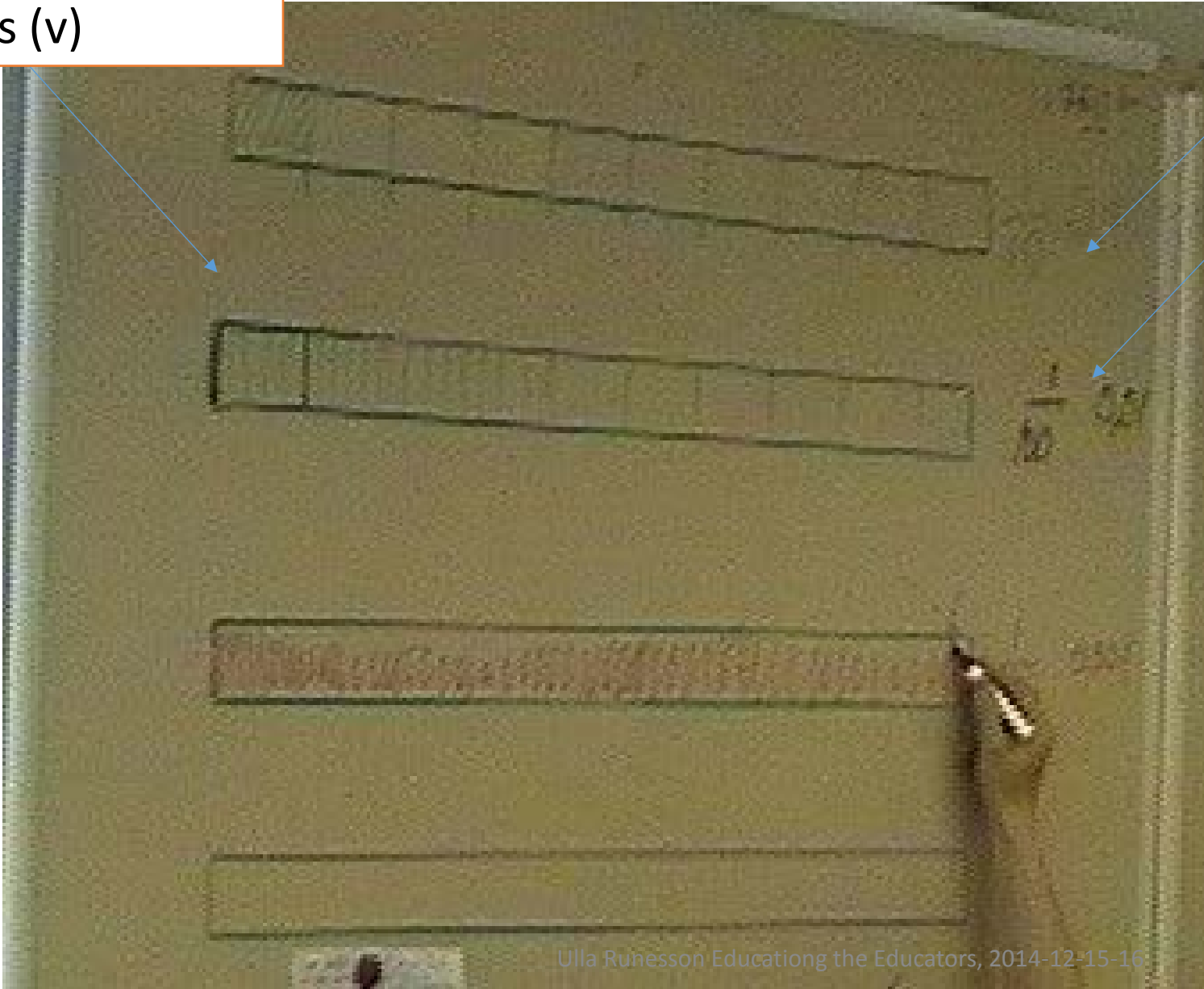
# Pattern of variation

Critical aspect	Vary	invariant
The interchangeable representation	Numerical representation (fraction, decimals, percentage)	Number e.g. 0.97
The number as a part of a whole	The whole	Number
The divisibility of parts	Parts	The whole



The whole (i)  
Parts (v)

Number (i)  
Representation (v)



In Learning study  
patterns of variation are  
used to help students to  
discern the critical  
aspects identified for  
the specific object of  
learning.

“Participation in PLCs can successfully engage teachers in discussion about content knowledge or knowledge about how to teach it (pedagogical content knowledge or PCK), positively impacting their understanding of or preparedness to teach content, or attitudes toward teaching methods. Participation in PLCs increased teachers’ deliberation about students’ mathematics or science thinking.” (National Commission on Teaching & America’s Future, 2010)

# Teachers' learning from Learning study

- learned and used a common language - the jargon of variation theory - to talk about teaching and learning, referring to the object of learning (OL), critical features (CF),
- variation in students' understanding of the OL, variation in teachers' ways of dealing with the OL,
- using variation as a guiding principle of pedagogical design
- to negotiate patterns of variation to help students to discern critical features

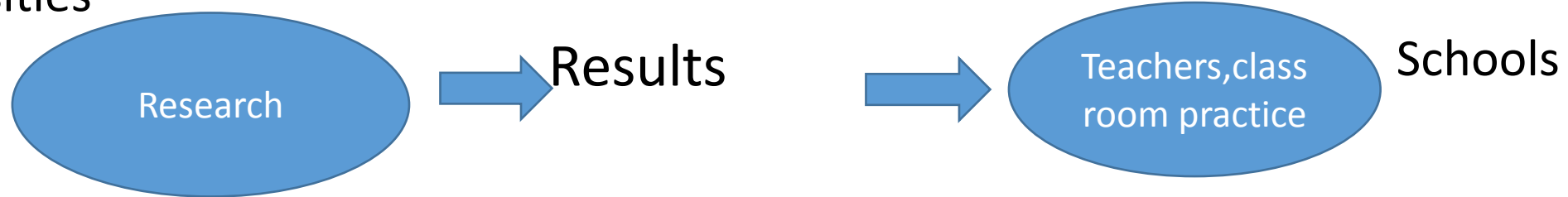
(Lo & Cheng, 2013)

# Long term effects?

- Teaching one thing at a time or many things together?  
(Kullberg, et al. under revision, Nilsson, & Vikström, submitted)

# Research and practice

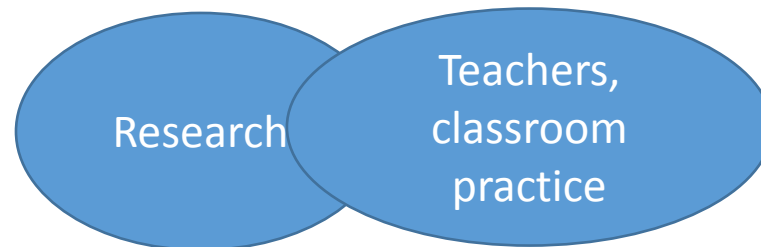
Universities



## *Research on teachers –*

Results must be transmitted or translated and implemented as conditions and recommendations

Universals  
External  
Generalisation



Specific  
Internal  
Specification

## *Research with and for teachers -*

Practice developing research as a part of school practice (Epistemic practice, Knorr Cetina, 2001) related to teachers' task. Clinical research (Bulterman-Bos, 2008)

# Learning study as clinical research? (Bulterman –Bos, 2008)

- The use of teachers' experiences and tacit knowing in the knowledge-producing process, the iterative process of specification of theory, and the uniqueness of the learning problems among different groups of pupils are central aspects of a particularistic clinical research process.
- In comparison with Lesson study, the Learning Study is more focused on constructing knowledge concerning objects of learning as well as teaching-learning relations. Teachers are included in the research as interpretative professionals making professional sense of particular educational events. (Carlgren, 2012)



# Bridging the Gap

Students' learning,  
Teachers' learning and  
Tesearchers' learning



Thank you!

# Further readings

- Cheng, E. C. and M. L. Lo (2013), “Learning Study: Its Origins, Operationalisation, and Implications”, *OECD Education Working Papers*, No.94, OECD Publishing. <http://dx.doi.org/10.1787/5k3wjp0s959p-en>
- Marton, F., & Lo, M.L. Towards a science of the art of teaching: Using variation theory as a guiding principle of pedagogical design. *International Journal for Lesson and Learning Studies*, Vol. 1 Iss: 1, pp.7 – 22
- Elliott, J. (2012). Developing a science of teaching through lesson study. *International Journal for Lesson and Learning Study*, vol. 1 iss.2.
- Marton, F. (2014). Necessary conditions of learning. Routledge