

Causal Chains in Visual Teacher Learning



Presentation for the CIDREE-IFÉ seminar

Professional vision and video-enhanced teacher development

Roundtable 3 *Alternative conceptions of “professional vision”*

March, 17, 2015

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Overview

- findings from R&D projects
- issues for future research
- presentations



- Literature review
- Portable video tool kit
 - three pilot projects with preservice and experienced teachers
 - quasi-experimental evaluation studies
- Reciprocal peer coaching with video
 - PD intervention with four cohorts of experienced teachers
 - evaluation and follow-up studies
- Viewing guides
 - quasi-experimental think-aloud study with preservice teachers

Conceptions of “professional vision”

- Three *paradigms*:
 - > Cognitivist
 - > Sociocultural
 - > Phenomenographic / semiotic
- What we need:
an undogmatic, “multitheoretic” stance
(cf. Suri & Clarke, 2009)
- What I prefer:
Vygotskyian causal-genetic approach
(Brouwer, 2005 and 2010)

Three *issues* in this roundtable:

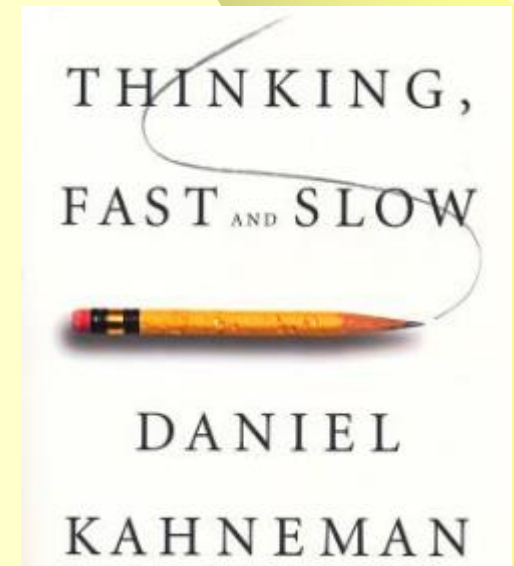
- Enculturation into the teaching profession
- Collaborative meaning-making
- Utilization of video-enhanced teacher-learning environments

Digital video: a promising medium

Key to encouraging *transfer* between practice and theory in professional education

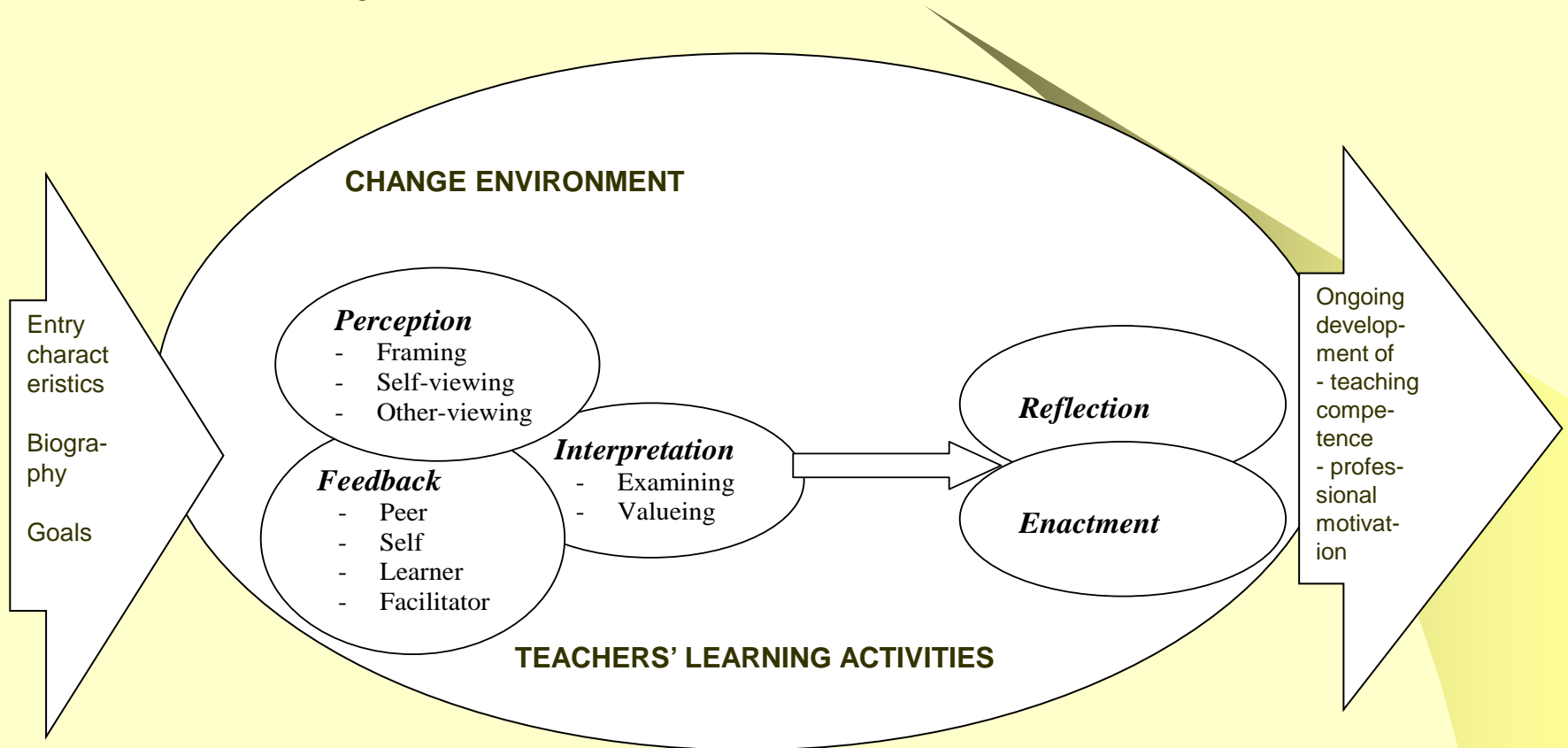
Unique features:

- focus on **interaction** between learners, **content** of learning and **teacher**
- **concreteness** entails **subject / domain specificity**
- moving images invoke **vicarious experience** and **emotional response**
- **repeated analysis** from different perspectives possible without the need for immediate action
- potential for **connecting** “thinking **fast** and **slow**” (Kahneman, 2011)



Visual Teacher Learning (VTL) Model

(cf. Clarke & Hollingsworth, TATE 2002)

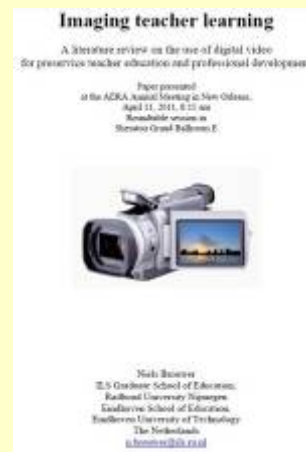


Review questions

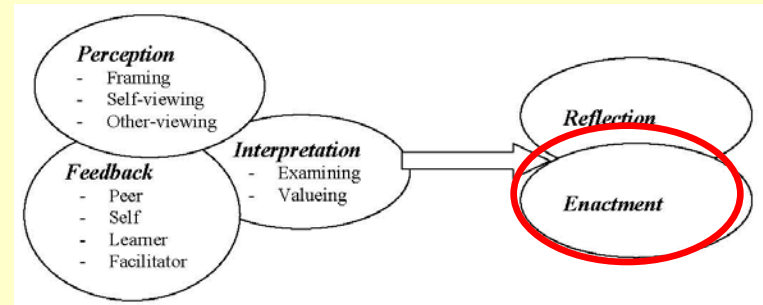
When using DV for their own learning,

1. what,
2. how and
3. in what conditions do teachers learn?

RESULTS
PROCESSES
CONDITIONS

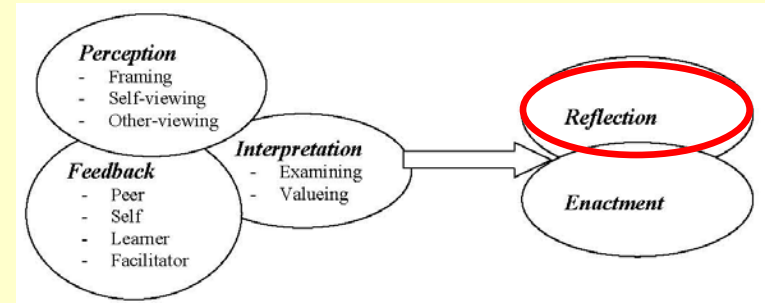


1.1 The nature of change in teachers' *action* after participating in VTL



- More **initiative** and **activating role** in the classroom
 - acquiring / developing / sustaining **basic teaching skills**
 - talking less oneself <> **eliciting learners** to engage with and talk about lesson content resulting in more on-task learner behaviour
 - more open and probing **questioning**
 - stimulating **higher-order thinking**
- Giving more and more focused **feedback**
- (Re)acting more **adaptively**
- Targeting and trying out **effective teaching** behaviours

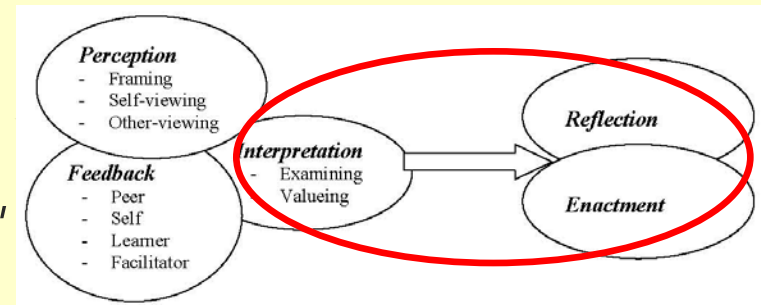
1.2 The nature of change in teachers' *thought* after participating in VTL



- Increasing **lesson analysis ability**:
 - identifying, naming and interpreting classroom **interactions**
 - paying more attention to learning **processes** in learners
 - **conceptualising own teaching action**
 - expanding **pedagogical content knowledge**
- **Recognising** effective teacher behaviours
 - **increasing interest in own** (positive and negative) **influence** on what and how learners learn
 - considering own teaching (more) in terms of **standards**
- Investing (more) in **lesson planning**:
 - discovering (more) **alternatives** for teaching action
 - searching for strategies to **help learners solve misconceptions** and overcome stumbling blocks

1.3 How teachers' thought *translates* into action - a hypothesis and some evidence

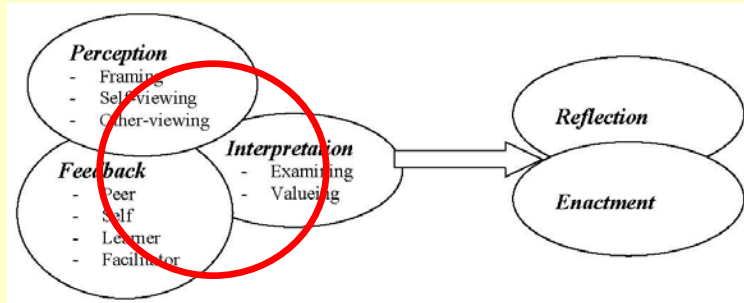
Participation in visual teacher learning, and/or peer collaboration encourages:



- Developing and expanding **pedagogical content knowledge**:
 - **attending** to and **interpreting interactions** between learner, content and teacher (developing an understanding of the unfolding of events within the “instructional triangle”)
 - **recognising** domain- and subject-specific effective teaching behaviours
- Investing in **lesson planning**
- Enacting step-by-step **changes in teaching action** which raise **instructional quality**

(cf. Kersting et al. 2012; Roth et al. 2011; Matsumura et al. 2013)

Portable video tool kit > task for student teachers



- Study research findings about **effective behaviours** for teaching reading comprehension
- Select **personal goal(s)** for student teaching from **structured viewing guide** (SVG)
- **Film** each others' **lessons** during student teaching
- **Examine** your video recordings, discuss selected fragments with each other and/or mentor
- **Edit** fragments from personally relevant viewing point(s) from SVG as and insert them as caption(s)
- Discuss clips during **peer consultation**

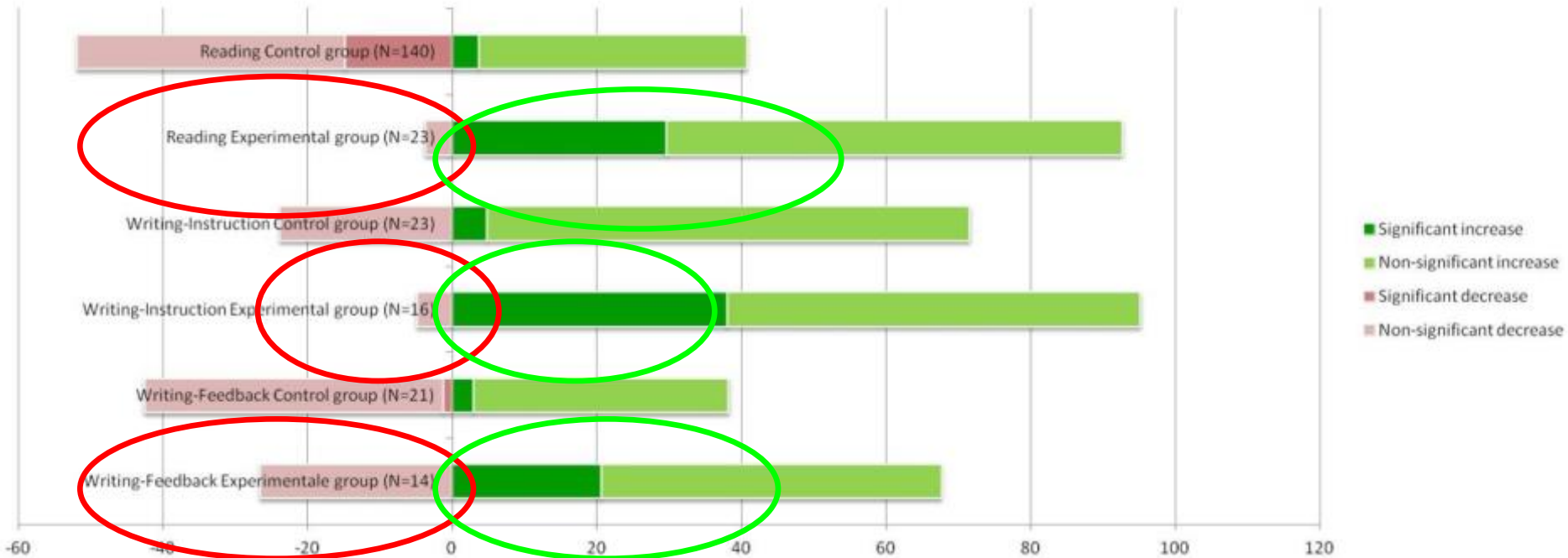
READING COMPREHENSION VIEWING GUIDE	
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Comparison between three pilot studies

Comparing proportions of criterion variables changing significantly and non-significantly over time shows interesting trends:

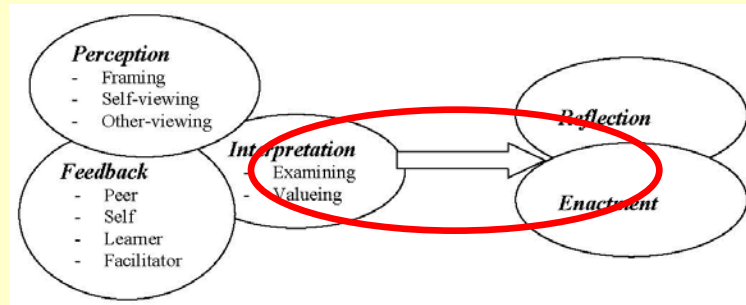
- Experimental groups consistently achieved larger gains.
- Control groups tended to stay on initial levels or even fall behind.



Let's consider carefully how viewing points should be selected, i.e. on the basis of

- research,
- theory and/or
- practical experience.

Reciprocal peer coaching with digital video



- Classroom observation and reciprocal peer coaching by couples of experienced teachers: "work mates"
- Plenary consultation every six weeks
- Facilitated as part of daily work schedule in PDS Stedelijk Gymnasium Nijmegen
- Supporting materials online and offline
- Using digital video for self-viewing and collegial feedback
- Consulting pupils



Learning outcomes

Project goals operationalised as criterion variables:

- 12 for goal I *Increasing variety in activity formats*
- 6 for goal II *Increasing opportunities for differentiation*
- 4 for goal III *Promoting self-directed learning*

	ENTRY	EXIT
THOUGHT	<i>Through peer coaching with video I want to get to know (more) ways to... in my teaching</i>	<i>Peer coaching with video has helped me get to know (more) ways to... in my teaching</i>
ACTION	<i>In my teaching, I usually....</i>	<i>Peer coaching with video has helped me (enact)... (more often) in my teaching.</i>

Findings

- Teachers and pupils agree that the three goals were *achieved to a decreasing extent*.
- *Pupils expect teachers to structure their learning activity during direct instruction as well as group work*

Patterns in visual teacher learning

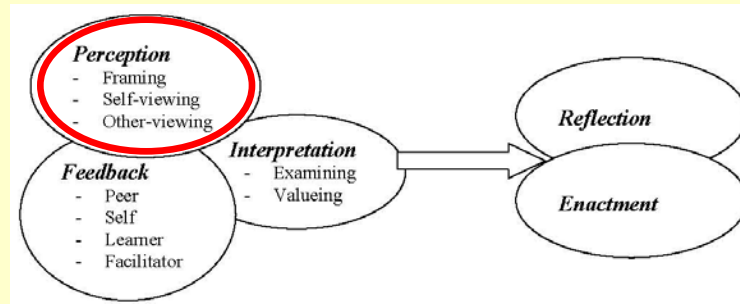
		ENTRY	
EXIT		No	Yes
	No	A. Standstill No personal learning goal set, no outcome achieved	B. Failure Personal learning goal set, no outcome achieved
	Yes	C. Serendipity No personal learning goal set, outcome achieved	D. Success Personal learning goal set, outcome achieved

Learning outcomes on the level of

- **thoughts** (discovering and elaborating on ideas) and
- **actions** (changing teaching practice)

differed between project goals / criterion variables as well as participants.

A study of “viewing in action”



Purpose:

find optimal contents and forms for **viewing guides** for student teachers in primary teacher education

Questions:

- I. **How do second-year students** in primary teacher education **react** to a video fragment of an arithmetics lesson?
- II. **Do their reactions differ** depending on different viewing conditions?

Design:

- N=12 (randomly selected; equally many men as women in each condition)
- *think-aloud protocols* and retrospective *interviews* in different **conditions**:

A without viewing guide

B with **open** viewing guide

C with **closed** / structured viewing guide

Cognitive Development Process Model

(Chan & Harris 2005)

Awareness	Reflection				
	<i>Comprehension</i>	<i>Acceptance</i>	<i>Rejection</i>	<i>Connection</i>	<i>Desire to act</i>
O1 Basic noticing O2 Advanced noticing O3 Recalling	B1 Interpreting B2 Expressing uncertainty B3 Assuming	A1 Agreeing A2 Liking A3 Judging positively	V1 Disagreeing V2 Not liking V3 Judging negatively	D1 Sharing belief D2 Comparing D3 Sharing experience	H1 Applying H2 Requesting more

Interrater reliability:

.51 after 1st round with two raters

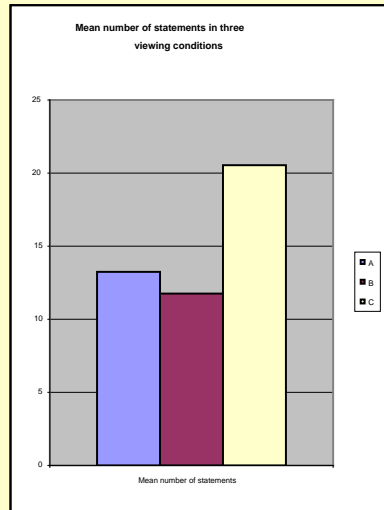
.82 after addition of third rater

Differences between conditions

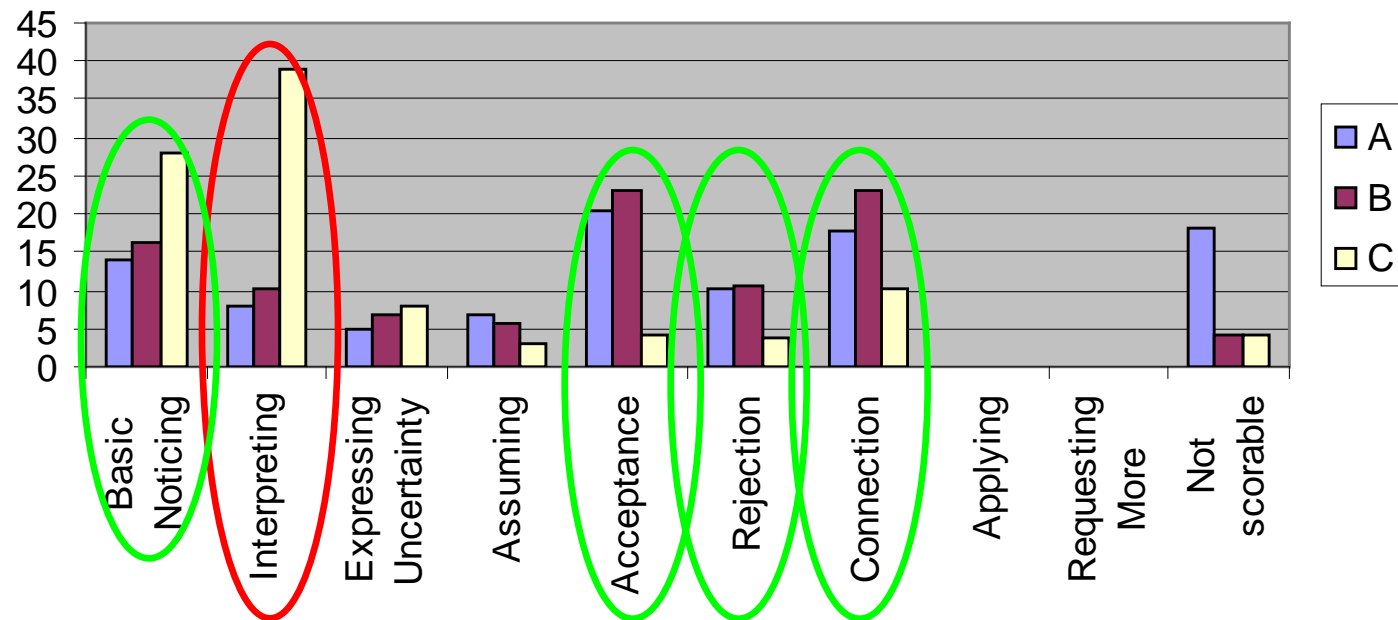
A without viewing guide

B categories only

C structured viewing guide



Mean % of statements in three viewing conditions



Distribution over Chan & Harris categories
only **significant** difference
remarkable differences

General conclusion:

Essential ingredients for VTL

- GOAL SETTING

on the basis of:

- teachers' personal-professional motives and intentions
- evidence-based knowledge about effective teaching

- PERCEPTION

authentic representation of content-focused interaction between teacher and learners

- FEEDBACK

facilitation and framing of focused discussion by teachers of questions / issues / principles relating to pedagogical action

- CHANGE ENVIRONMENT

- trust and community in collegial learning
- just-in-time accessible hypermedia sources and tools

Issues for future research

Focused lesson analysis

- Defining and demonstrating effective teaching skills for higher-order learning in specific subject domains
- Use of model and action videos in preservice teacher education and PD
- Use of viewing guides and other tools for focused lesson analysis

Teacher collaboration using video records of teaching and learning

- Collegial observation, feedback and consultation
- Reciprocal peer coaching
- Collaborative lesson planning
- Training facilitators / teacher leaders for VTL

Tool use

- Development, use and impact of video platforms on the worldwide web
- Computer-supported Collaborative Learning (CSCL) with video
- Teacher editing of lesson fragments
- Using video in blended learning settings
- Mobile video applications

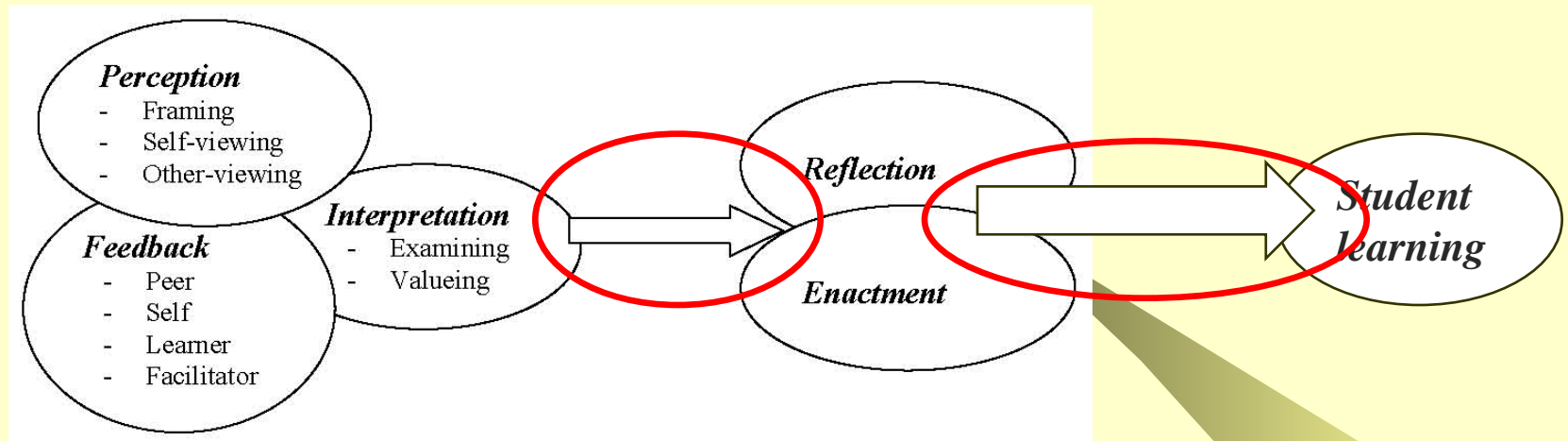
Enacting effective teaching skills

- Articulating and demonstrating domain-specific teaching strategies and skills to promote higher-order learning
- Acquiring classroom management skills
- How teachers translate thought into action
- Impact of modified teacher behaviors on learners
- Meaning-making and emotions in learning to teach

Video assessment of classroom teaching

- Validity criteria
- Instruments
- Procedures
- Privacy rules

What professional vision is about...



- How teachers' perception and meaning-making translate into interaction with learners
- Impact on their clients' learning (processes and outcomes)

And how to research it:

- Explaining causation:
 - > demonstrate relationships between system components
 - > reconstruct processes responsible for these relationships
- Epistemological perspectives (cf. Brouwer, 2010):
 - ecological
 - genetic
 - activity

Thank you for your attention

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References

- Brouwer, C.N., Korthagen, F.A.J. (2005). Can Teacher Education Make a Difference? *American Educational Research Journal* 42(1), 153-224.
- Brouwer, C.N. (2010). Determining Long-term Effects of Teacher Education. In: Peterson, P., Baker, E., McGaw, B. (Eds.). *International Encyclopedia of Education, Volume 7*. Oxford: Elsevier, 503-510.
- Brouwer, C.N. (2011a). *Equipping Teachers Visually*. Zoetermeer: Kennisnet (<http://www.kennisnet.nl/onderzoek/alle-onderzoeken/equipping-teachers-visually>).
- Brouwer, C.N. (2011b). *Imaging Teacher Learning. A Literature Review on the Use of Digital Video for Preservice Teacher Education and Teacher Professionalization. Paper Presented at the AERA Annual Meeting*. Nijmegen: ILS Graduate School of Education.
- Brouwer, C.N., Robijns, F. (2014). In Search Of Effective Guidance For Preservice Teachers' Viewing Of Classroom Video. In: Calandra, B., Rich, P. (Eds.). *Digital Video for Teacher Education: Research and Practice*. New York / London: Routledge, pp. 54-69.
- Brouwer, C.N. (2014). Was lernen Lehrpersonen durch die Arbeit mit Videos? Ergebnisse eines Dezenniums empirischer Forschung [Visual Teacher Learning: Review of a Decade of Research]. *Beiträge zur Lehrerbildung* 32(2), 176-196.
- Chan, P., & Harris, R. (2005). Video Ethnography and Teachers' Cognitive Activities. In J. Brophy, & S. Pinnegar (Hrsg.), *Learning from Research on Teaching: Perspective, Methodology and Representation. Advances in Research on Teaching, Volume 11*. Amsterdam: Elsevier, pp. 337-375.

References (continued)

- Kersting, N.B., Givvin, K.B., Thompson, B.J., Santagata, R., Stigler, J.W. (2012). Measuring Usable Knowledge: Teachers' Analyses of Mathematics Classroom Videos Predict Teaching Quality and Student Learning. *American Educational Research Journal* 49(3), 568-589.
- Matsumura, L., Garnier, H., & Spybrook, J. (2013). Literacy coaching to improve student reading achievement: A multi-level mediation model. *Learning and Instruction* 25, 35-48.
- Roth, K.J., Garnier, H.E., Chen, C., Lemmens, M., Schwille, K., Wickler, N.I.Z. (2011). Videobased Lesson Analysis: Effective Science PD for Teacher and Student Learning. *Journal of Research in Science Teaching* 48(2), 117-148.
- Suri, H., Clarke, D. (2009). Advances in Research Synthesis Methods: From a Methodologically Inclusive Perspective. *Review of Educational Research*, 79(1), 395-430.