

Let the video be your guide

A case study of a video-based design research



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- The case: DBR project in PVSE (2005-2010)
- The video: 3 camera approach observations

Discussion

- Web of reasons
- CHAT and Design Based Research



The case

Design based research in 3 phases:

- Case study (06/07)
- Intervention I at 2 schools (07/08)
- Intervention II at 4 schools (08/09)



The case

- **Intervention:**

Design and construct a tandem tricycle

Providing vs. guided co-construction (Mercer)



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The case

Method:

DBR: assignment for students,
tools for teachers to implement

qualitative:

interviews, observations (all
video)

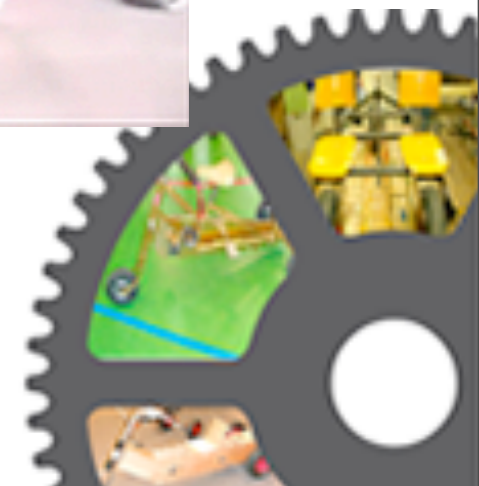
quantitative (phase 2/3):

pre- and posttests



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The case



The case

Conclusions:

Designing by students leads to better understanding (in maths, physics)

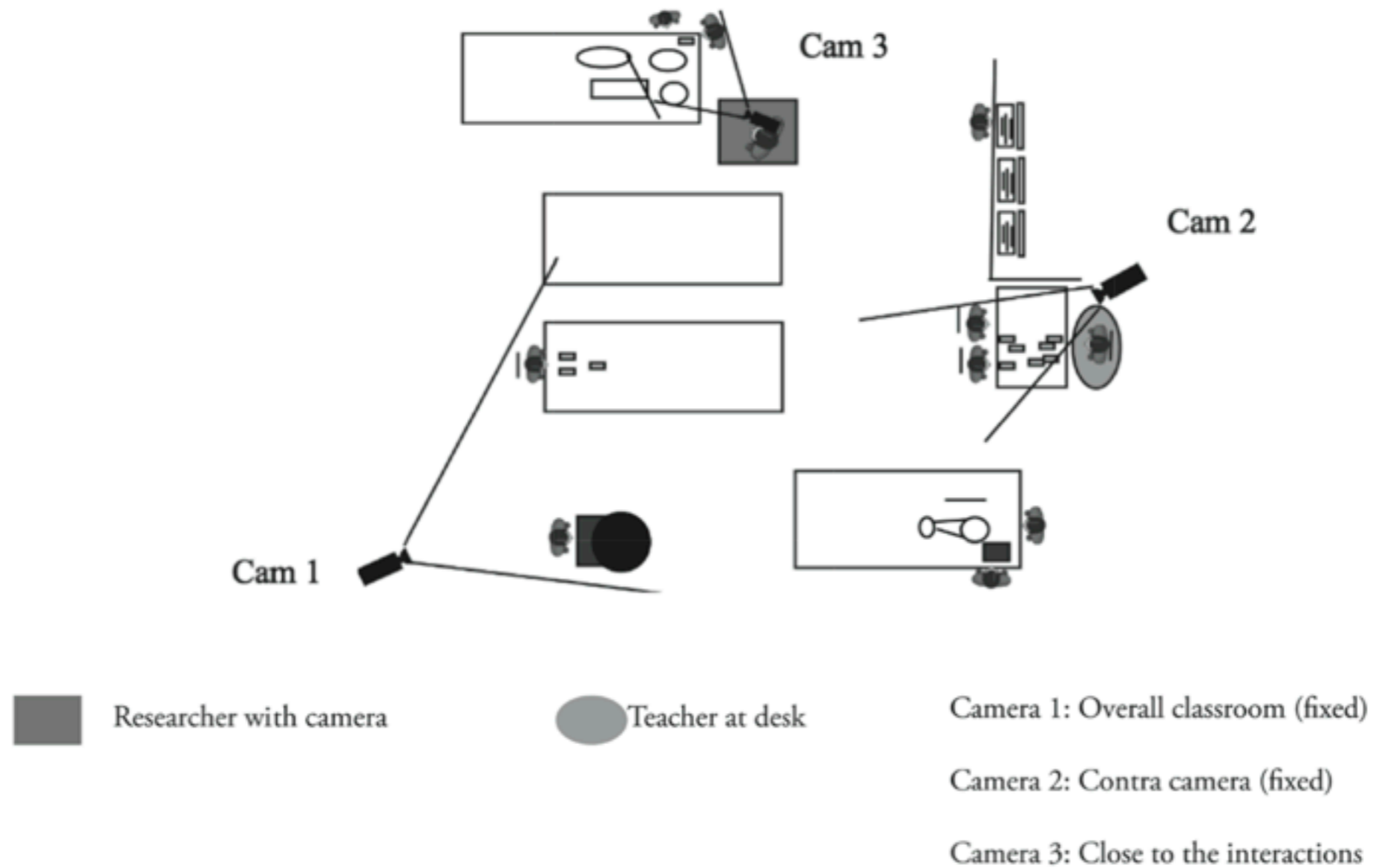
Teachers should simulate 'real' design process

Models/drawings as tools between theory and practice



The video

Figure 2.3 Video data collection in the classroom



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The video

	video (hrs)	Schools	Students
Case study	30	1	6
First experiment	40	2	65
Final experiment	30	4	87



The video Information at three levels

Baseline level: research narrative

**Methodological level: adjustments in
intervention and method**

Metalevel: shifting perspective

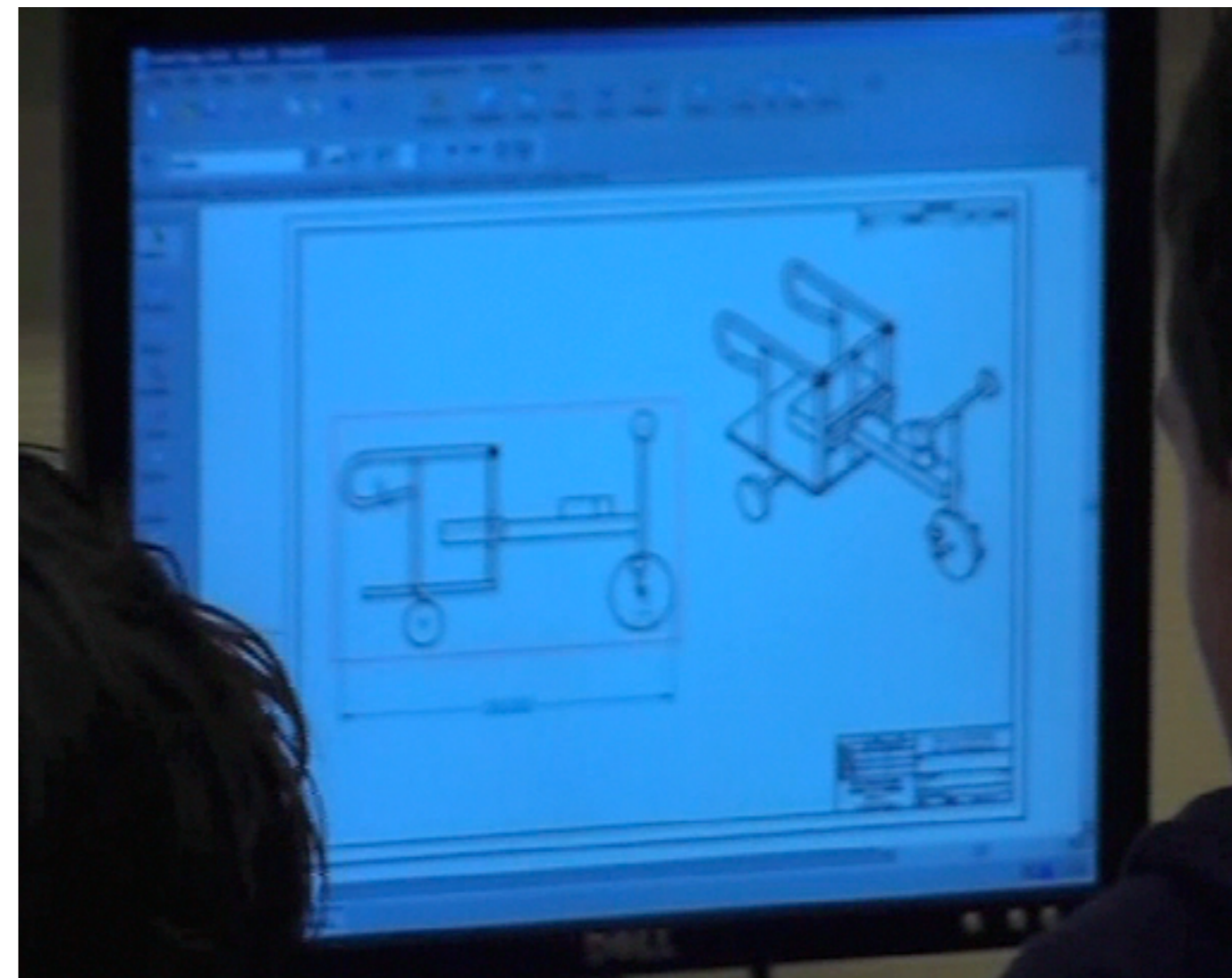


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Baseline level

Intervention I

Case study



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Baseline level

Intervention I:
teacher training



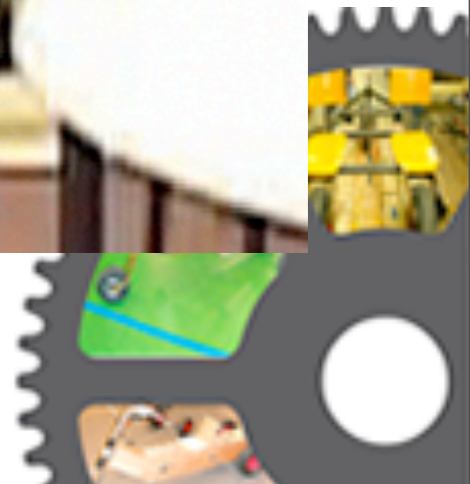
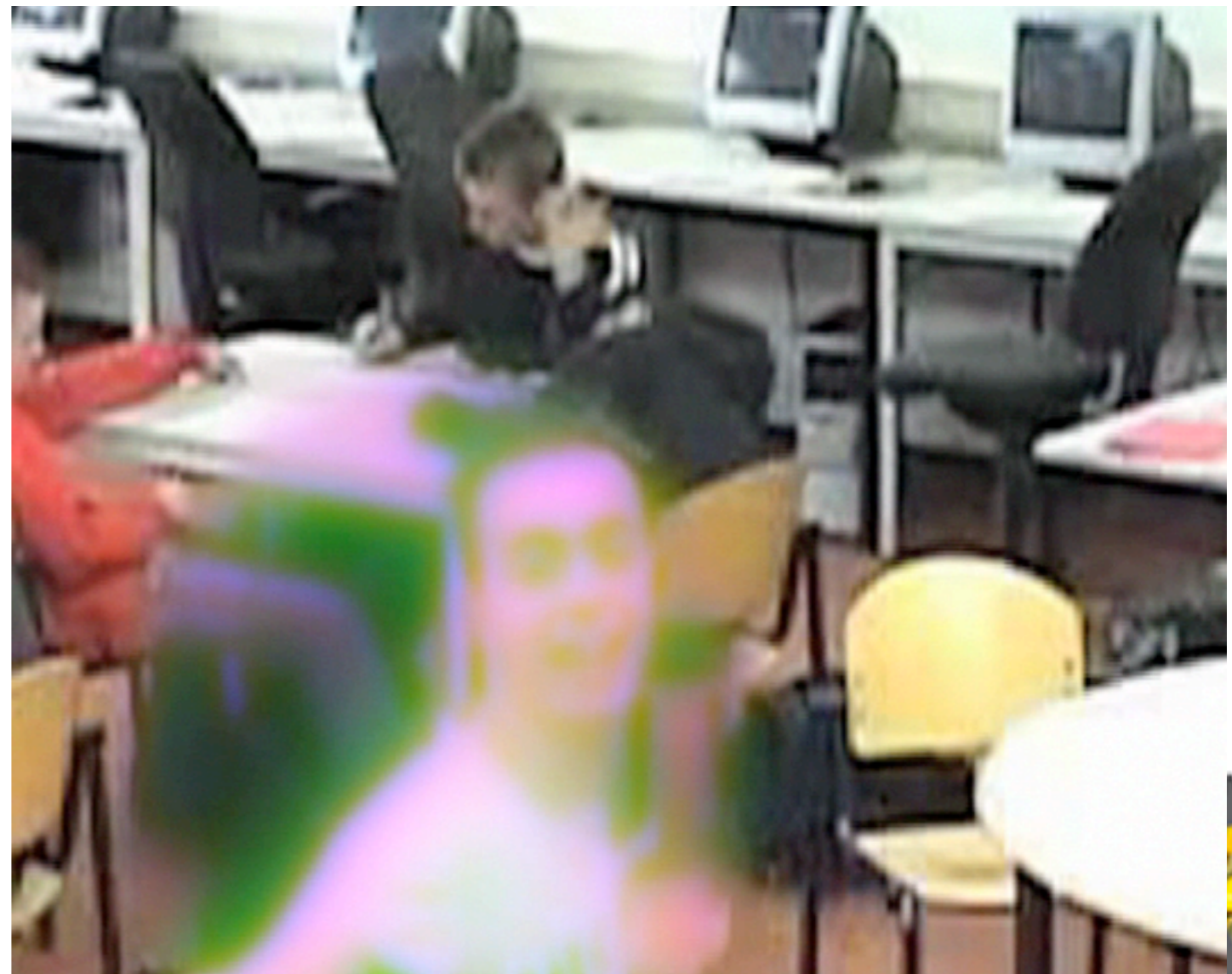
Intervention II



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Methodological level

Camera
awareness



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Metalevel

Shifts in perspectives:

Issues on Baseline level	Implications for next phase Methodological level		Shifts on Meta-level
	Intervention sublevel	Data sublevel	
<p>Case study - Knowledge remained situated</p> <ul style="list-style-type: none"> - Models were provided - Client needs to be real - Integration subject matter* 	<ul style="list-style-type: none"> - Guidance and instrument for teachers (with suggested lessons) - Prototype competition 	<ul style="list-style-type: none"> - More distant video approach (more schools, more students) - Also quantitative data 	<p>Reflection on production process may lead to recontextualisation (prototype)</p>
<p>First experiment - Drawings disappear during process</p> <ul style="list-style-type: none"> - Models in experimental condition are better - Minimal guidance on theory and modelling* - Little or low quality student drawing* 	<ul style="list-style-type: none"> - 'Prototype lessons' (explicit attention for models) - Backward engineering models 	<ul style="list-style-type: none"> - Focus of observations around week 3-6 	<p>Models should be tools like professional designers</p>
<p>Final experiment</p> <p>a) First study Better performing schools have:</p> <ul style="list-style-type: none"> - Teachers with academic background - Higher teacher-student ratio 		<ul style="list-style-type: none"> - Deeper qualitative analyses needed 	<p>'Disciplined perception' should be promoted (vocational & academic)</p>
<p>b) Second study At best performing schools:</p> <ul style="list-style-type: none"> - Explicit attention for disciplines - Models as tools the entire process 	<p>Parameters for assignment and teacher guidance:</p> <ul style="list-style-type: none"> - Potential theory-rich assignment - Teacher student ratio - Teachers' background - Use modelling as core - Explicit reflection on disciplines 		<p>Integrated pedagogics with modelling as core activity.</p>

found in interviews or member checking



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Web of reasons

Table 3

Level of integration in utterances

Levels of integration	School 1				School 2				
	week 4	week 6	week 7	week 10	week 3	week 6	week 10	Week 10 (interview)	Presentation
Level 1	8	8	4	4		4		1	2
Level 2	1		1			3			1
Level 3						4		2	2
Level 4									



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Web of reasons

- Pre- & posttests small sign results
- Using Brandoms ‘web of reasons’ creates a narrative of theoretical development (inferentialism)
- However, as models, statements & reasoning ‘disappear’ in process

What about the boundaries, what about embodiment?



CHAT & DBR

- Engeström: formative intervention & double stimulation
- Agency participants
- Open ended
- improving theory & practice



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CHAT & DBR

- In education ‘triple/quadruple stimulation’?
- Tools for teacher and student (and researcher)
- What are the boundaries, what are the systems, what’s the activity?
- Open unit of analysis?



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