Lesson Planning and Video Analysis as Data Tools for Assessing PCK

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Overview of the Session

- Description of research project and theoretical framework
- Description of Data Tool 1: Video Analysis
- Small group work
- Description of Data Tool 2: Lesson Planning
- Small group work
- Whole-group discussion

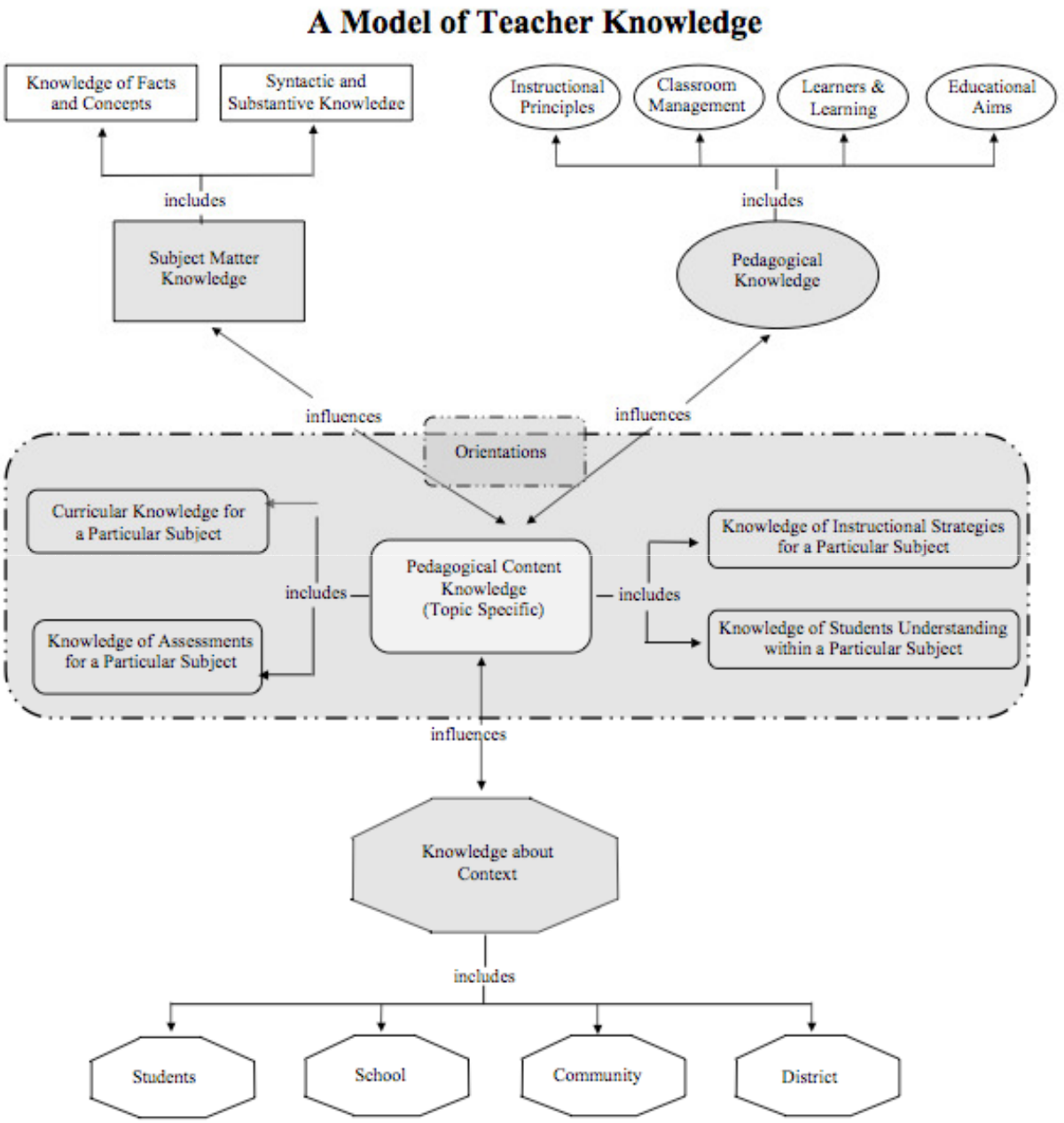
Researching Science and Mathematics Teacher Learning in Alternative Certification Models

- NSF-funded (Award No. DUE-0202847)
- 2006-2011 (5 years)
- Purpose: to investigate science and mathematics teacher learning in the context of an alternative certification program (designed for individuals with baccalaureate degrees in science or mathematics) employing two different models of field-based preparation.
- We are collecting longitudinal data from 72 participants at five transition points in their T.E. programs and into their first year of teaching

Theoretical Framework

As presented by Magnusson, Krajcik, & Borko (1999)

who adapted Grossman's (1990) framework



NCTM Research Pre-Session, 2007

Research Questions:

- What do teachers learn and what facilitates their learning of:
  - mathematical content for teaching?
  - mathematics learners?
  - mathematics curriculum?
  - mathematics instructional strategies?
  - assessment?
- What constrains the development of these aspects of teacher knowledge?

Data Tool: Video Analysis Task

- Selection of Clip
- Process
- Purpose

Process

Participants:

- Write a response to Part A
- Watch video [Annenberg Math Video Library 9-12]
- Write a response to Part B
- Engage in focus group discussion

Purpose

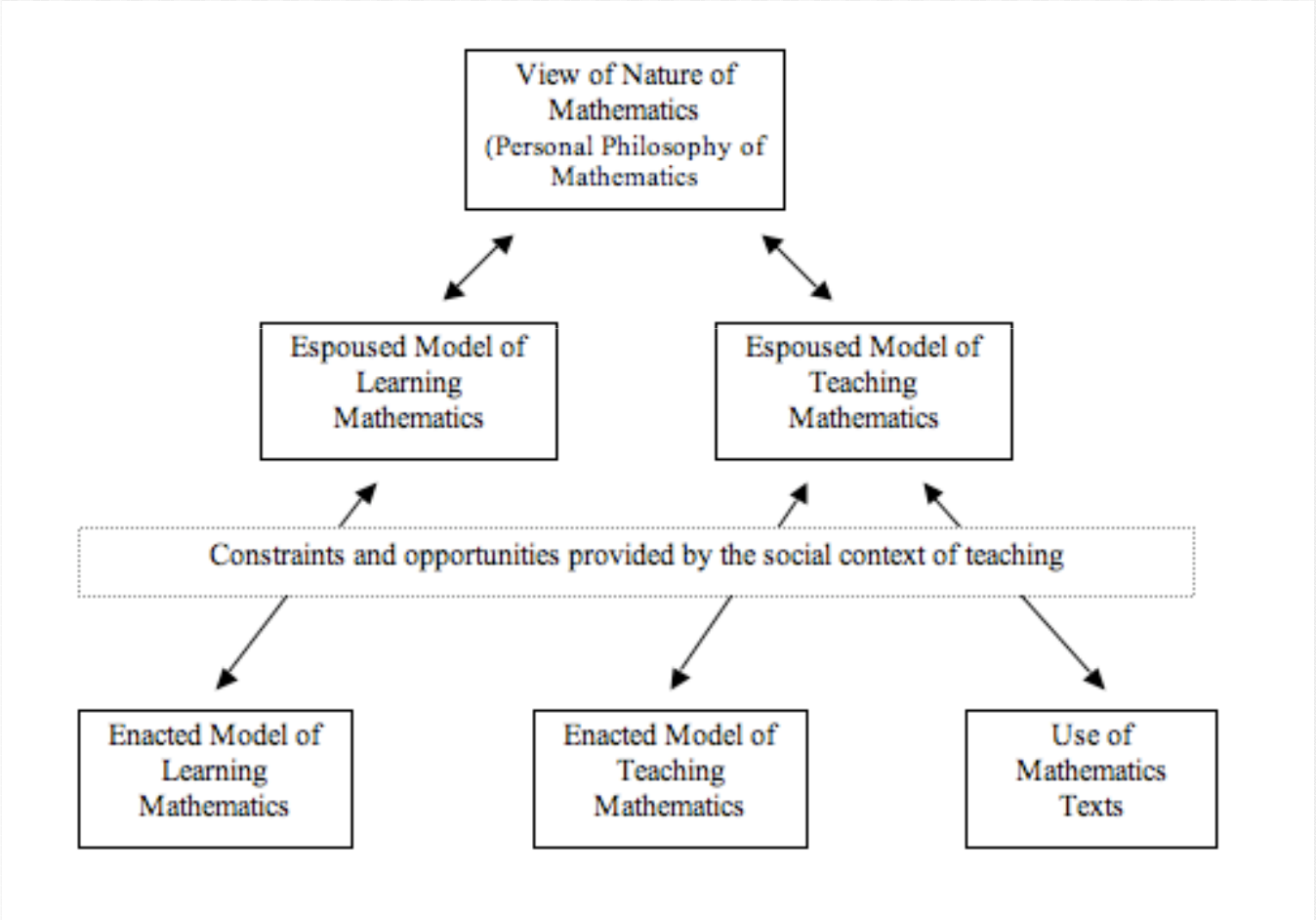
Purpose: To collect data with regard to participants' **orientations.**

Goals and purposes related to the teacher's role, students' roles, and the nature of the discipline of mathematics.

Magnusson, S., Krajcik, J., & Borko, H. (1999). Examining pedagogical content knowledge. In J. Gess-Newsome & N.G. Lederman (Eds.), *Examining pedagogical content knowledge: The construct and its implications for science education* (pp. 100-101). Dordrecht: Kluwer.

Orientation	**Goal of Teaching Science**	**Characteristic of Instruction**
Didactic	Transmit the facts.	Knowing the facts.
Guided Inquiry (Magnusson and Palinscar, 1995)	Constitute a community of learners whose members share responsibility for understanding the physical world.	Learning community-centered. The teacher and students participate in defining and investigating problems, determining patterns, inventing and testing explanations, and evaluating the utility and validity of their data and the adequacy of their conclusions…

Source: Ernest, Paul. (1998, August). The impact of beliefs on the teaching of mathematics. Retrieved January 22, 2007 from http://www.people.ex.ac.uk/PErnest/impact.htm



Triangulation

" My teaching style is pretty much lecture followed by seatwork or group work ending with class discussion."

"I think more often than not, it's going to be, you are going to have to do several examples with them before it clicks with all of them."

"I would want to have them [the students] do most of the analytical thinking and how they would take certain data and put it together and do a problem and then come up with an answer….outside of the textbook thinking…something new and interesting to look at and analyze.."

Data Tool 1: Video Analysis

Play video

Small Group Discussion

Your work:

Examine the data that resulted from this data collection tool.

Discuss the evidence found in these data with regard to participants' **orientations**

Data Tool: Lesson Planning Task

Purpose: to collect data regarding participants' PCK

Participants:

- Develop an instructional plan for two consecutive days
- Engage in an interview about their plans

Small Group Discussion

Your work:

Examine the data that resulted from this data collection tool.

Discuss the evidence found in these data with regard to participants' **knowledge of learners**

Knowledge of Learners

Magnusson, Krajcik, & Borko (1999)

Knowledge teachers must have in order to help the students develop specific mathematical knowledge:

- Knowledge Requirements for Learning
- Knowledge of Areas of Student Difficulty

Whole Group Discussion

Researching Science and Mathematics Teacher Learning in Alternative Certification Models

- Our Partners at the University of Missouri
  - Sandra Abell
  - Pat Friedrichsen
  - Enrique Pareja
  - Christa Jackson
  - Mark Volkmann
  - Patrick Brown
  - Deanna Lankford

Thanks

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