

METHODOLOGY SHORT COURSE
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DAY 1: RESEARCH DESIGN

- Designing research studies: Moschkovich and Brenner (2000)
- Design decisions for video: Why video? When video? Video plus other data
- Advantages and disadvantages of video data

DAY 2: USING VIDEO

- Multiple uses of video
- Collecting video (and audio), Hall (2000), Roschelle (2000)
- Using video with Latino participants

DAY 3: ANALYZING VIDEO

- Preparing video for analysis
- Selection criteria for segments to analyze
- Collective review of tools for preparing and sharing video

**DAY 4: ANALYZING VIDEO DATA OF STUDENT LEARNING—UNCOVERING
THE MATHEMATICS**

Theoretical frameworks

- Situated and socio-cultural perspective (Moschkovich, 2002)
- Gee's (1996 and 1999) questions for Discourse analysis
- Ethno-mathematical perspective (D'Ambrosio, 1985; Nunez, Schliemann, and Carraher; 1993)

Readings before Short Course

1. Moschkovich, J.N. and Brenner, M. (2000). Integrating a naturalistic paradigm into research on mathematics and science cognition and learning. In R. Lesh & A. Kelly (Eds.) *Handbook of Research Design in Mathematics & Science Education*. Lawrence Erlbaum Associates, Inc: New Jersey, 457-486.
2. Hall, R. (2000). Video-recording as theory. In R. Lesh & A. Kelly (Eds.) *Handbook of Research Design in Mathematics & Science Education*. Lawrence Erlbaum Associates, Inc: New Jersey, 457-486.
3. Roschelle, J. (2000). Choosing and using video equipment for data collection. In R. Lesh & A. Kelly (Eds.), *Handbook of Research Design in Mathematics & Science Education*. Lawrence Erlbaum Associates, Inc: New Jersey, 457-486.

Post Course Readings:

4. Poland, B. (2002). Transcription Quality. In J.F. Gubrium & J.A Holstein (Eds.) *Handbook of Interview Research Context and Method*. Sage: Thousand Oaks, California, 629-649.
5. National Research Council. (2001). *The Power of Video Technology in International Comparative Research in Education*. Board on International Comparative Studies in Education, Monica Ulewicz and Alexandra Beatty, Editors. Board on Testing and Assessment, Center for Education, Division of Behavioral and Social Sciences and Education. National Academy Press: Washington, D.C.
6. Suter, L. and Frechtling, J. (2000). *Guiding Principles for Mathematics and Science Education Research Methods: Report of a Workshop*. Retrieved from <http://www.nsf.gov/pubs/2000/nsf00113/nsf00113.html>

Recommended further reading

7. Brown, A. (1992). Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings. *Journal of the Learning Sciences*, 2(2), 137-178.
8. Cole, Hodd, and McDermott. Ecological niche picking, LCHC manuscript.
9. Eisenhart and Borko (1993). Designing classroom research. Allyn & Bacon.
10. Glaser and Strauss. (1967). The discovery of grounded theory
11. Ochs, E. Transcription as theory.
12. Romberg. (1992). Perspectives on scholarship and research methods. In Growsu (Ed.) *Handbook of Research on Math Learning and Teaching*.
13. Sowder (1988). Ethics in mathematics education research. In Sierpinska and Kilpatrick (Eds.) *Math Education as a Research Domain*. Kluwer.
14. Spindler and Spindler (1992). Cultural process and ethnography. In LeCompte, Millroy, and Preissle (Eds.) *The Handbook of Qualitative Research in Education*. Academic Press.

NOTES

1. Methodology

- Not techniques, THEORY plus methods
- Video is a technique that can be used from multiple theoretical stances
- Research design decisions depend on CLEAR AND FOCUSED RESEARCH QUESTIONS
- IMAGINE what data would look like that might answer the research questions
- No researcher or research study can cover everything, FOCUS on what one study can do well
- A naturalistic paradigm is different than experimental design BUT design and analysis are still SYSTEMATIC

2. Naturalistic paradigm (Moschkovich and Brenner, 2000)

Principles

- Consider multiple points of view
- Connect theory verification and theory generation
- Study cognitive activity in context

Note:

- Mixed approach, instruments, methods
- Ecological validity for cognitive tasks (p. 466)
- Definition of context (p. 462) (Lave 1988)
- Ethnographic stance (p.474)
- Standards of quality (last section, table on p. 479)

DISCUSSION QUESTIONS

DAY 1 DISCUSSION QUESTIONS

1. What are some research design issues that you are (still) grappling with?
 2. What are some questions you have about research design?
 3. What are some questions you have about designing for video, collecting video, and preparing video for analysis?
 4. Try to ground your discussion and questions in an example, a study you are working on or an example from the readings.
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DAY 2 DISCUSSION QUESTIONS

Distributing and distributed expertise:

1. What are some things about research design that you now know, that you wish someone had told you before you designed a study, or that you have recently learned?
 2. What are some things you have learned about **collecting video**?
 3. Three (or more tips) for others: Remember to.....
 4. What are some things you have learned about **preparing video**?
 5. What are some things you have learned about **analyzing video**?
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DAY 4 DISCUSSION QUESTIONS:

1. Do you see students participating in mathematical practices? If yes, which practices? What is your evidence?
2. Do you think that student activity reflects mathematical competence? If yes, what is your evidence? What kinds of mathematical competence do you see in student activity?
3. Are any “big” mathematical ideas evident in student activity (students need not be conscious of the mathematical ideas themselves)? If yes, which ones? What is your evidence? If not, which “big math ideas” do you see as potentially possible in this discussion?

GROUND RULES FOR WATCHING CLASSROOM VIDEOS

1. **What people in a classroom do or say makes sense to them (even if not to us).**
Try to understand things from their perspective (as well as your own).
2. **No judging, evaluating, labeling, or blaming.**
Focus on resources, not obstacles, errors, or deficiencies
Focus on how learners make sense, not on what they do wrong.
If you think a teacher or a student does something wrong....
stop yourself and focus on something else.
In particular, no blaming the teacher, the student, the topic, or the family.
3. **Stick to what you “see” on the tape.**
Not what you imagine or know from other experiences or sources. But you can still wonder and ask questions!
4. **What we “see” depends on the lens we use.**
Be aware of what theoretical framework, assumptions, and perspective you are using.