

**Video Data Methodology, Spring 2014**  
**16:300:563:01 (Index # 17653)**  
**3 Credits**

Instructor: Carolyn A. Maher	<a href="mailto:carolyn.maher@gse.rutgers.edu">carolyn.maher@gse.rutgers.edu</a>
Phone Number 848-932-0802	Class room: GSE-30
Office Hours: Mondays, 2:00-4:00 (on-campus dates only) and by appointment, Room 231 GSE	Prerequisites or other limitations: School 16
Mode of Instruction: <input type="checkbox"/> Lecture <input type="checkbox"/> Seminar <input checked="" type="checkbox"/> Hybrid <input type="checkbox"/> Online <input type="checkbox"/> Other	Permission required: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes

**Learning Goals**

This course is designed to prepare you to conduct research in education that makes use of video data through a variety of activities that include learning from experienced researchers, analyzing video data, writing scholarly data analyses, and participating in research activities.

**Course Catalogue Description**

Focuses on critical examination of studies that have used video data, design of new research that will use video data, and methodological techniques for analyzing video data.

**Course Requirements**

Successful completion of the course requires that actively engage in all activities and submit all assignments. This process requires that you:

1. Attend all class sessions.
2. Participate fully in all online activities, both using course website and VMC website.
3. Attain IRB Certification to conduct Human Subjects Research. Human Subjects Certification can be obtained through completion of a Sakai course. Anticipated time of completion is three hours, and information about to proceed can be found at the following website:  
<http://orsp.rutgers.edu/content/hscp-instructions-and-link-online-exam>  
Upload a copy of your letter acknowledging completion of the program, which will have your IRB Certification date to the dropbox on eCollege.
4. Review of two doctoral dissertations, one from Rutgers and a second from another university, that yielded findings from analysis of video data. Report must include a detailed discussion of methodology used in the research and how video data were analyzed to address research questions posed in each study, including how data were coded. Discuss the studies from the perspective of video use and significance of findings.
5. Individual research projects using Video Mosaic Collaborative (VMC) Repository collection of archived videos and metadata.

6. Reflection paper (to include activities, discussions, readings and project work)

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>

**Readings and Dissertations:** Required and recommended articles and dissertations will be posted on the course website.

Recommended book: Goldman, R., Pea, R., Barron, B., & Derry, S. (eds.). (2007). *Video research in the learning sciences*. Mahwah, NJ: Erlbaum

## COURSE OUTLINE AND ASSIGNMENTS

<p>1/27/2014 ON-CAMPUS</p>	<p><b>Class Activity:</b> (1) Introduction and course overview; (2) Summary of Davis Institute research with video data; (3) What is the <i>Video Mosaic Collaborative</i>?</p> <p><b>Assignment:</b> Readings and Online Discussion per guiding questions. (1) Palus, M. F. &amp; Maher, C. A. (2011). Teacher education models for promoting mathematical thinking. <i>Proceedings of 35th Conference of the International Group for the Psychology of Mathematics Education</i>. Ankara, Turkey: PME.</p>
<p>2/3/2014 ON-CAMPUS</p>	<p><b>Class Activity:</b> Hands-on training for use of Analytic Tool for VMC Repository with full video.</p> <p><b>Assignment:</b> Readings and Online Discussion per guiding questions. (1) Agnew, G., Mills, C. M., &amp; Maher, C. A. (2010). VMCAnalytic: Developing a collaborative video analysis tool for education faculty and practicing educators. In R. H. Sprague, Jr. (Ed.), <i>Proceedings of the 43rd Annual Hawaii International Conference on System Sciences (HICCS-43): Abstracts and CD-ROM of Full Papers</i>. IEEE Computer Society, Conference Publishing Services: Los Alamitos, CA.</p>

<p>2/10/2014 ON-CAMPUS</p>	<p><b>Class Activity:</b> Talk by Dr. Shlomo Vinner “<i>Thought processes which lead to generalizations in every day contexts and in mathematical contexts</i>”. See eCollege for abstract.</p> <p><b>Assignment:</b> Group work using VMCAalytic and Social Networking Tool. See details on line.</p>
<p>2/17/2014 TBA</p>	<p><b>Class Activity:</b> How is video being used for current research on teacher education to enhance learning of how children reason mathematically?</p> <p><b>Assignment:</b> Readings and Online Discussion per guiding questions.  <b>(1)</b> Maher, C. A., Landis, J. H. &amp; Palius, M. F. (2010). Teachers attending to students’ reasoning: Using videos as tools. <i>Journal of Mathematics Education</i> 3(2), 1-24.  <b>(2)</b> Maher, C. A. (2008). Video recordings as pedagogical tools in mathematics teacher education. In D. Tirosh and T. Wood (Eds.), <i>International Handbook of Mathematics Teacher Education: Vol. 2: Tools and Processes in Mathematics Teacher Education</i> (pp. 65-83). Rotterdam, The Netherlands: Sense Publishers.</p>
<p>2/24/2014 TBA</p>	<p><b>On-Line Activity:</b> How is video being used for current research on pre-service teacher education to enhance learning of children’s mathematical reasoning?</p> <p><b>Assignment:</b> Readings and Online Discussion per guiding questions.  <b>(1)</b> Chapman, O. et al. (2011). Supporting the development of mathematical thinking. <i>Proceedings of 35th Conference of the International Group for the Psychology of Mathematics Education</i>. Ankara, Turkey: PME.  <b>(2)</b> Read and discuss student dissertation/dissertation proposals (Brophy, McGowan, Lieberman).</p>
<p>3/3/2014 ON-CAMPUS</p>	<p><b>Class Activity:</b> The analysis of video data</p> <p><b>Assignment:</b> Steffero, M. (2010). <i>Tracing beliefs and behaviors of a participant in a longitudinal study for the development of mathematical ideas and reasoning: A case study</i>. Unpublished doctoral dissertation, Rutgers University.</p>
<p>3/10/2014 ON-CAMPUS</p>	<p><b>On-Line Activity:</b> Exploring video research in the learning sciences.</p> <p><b>Assignment:</b> Readings and Online Discussion per guiding questions.  <b>(1)</b> Goldman, R. (2007). Video representations and the perspective framework: Epistemology, ethnography, evaluation, and ethics. In Goldman, R., Pea, R., Barron, B. and Derry, S. (Eds.), <i>Video Research in the Learning Sciences</i>, 3-38, Lawrence Earlbaum Associates: Mahwah.</p>
<p>3/24/2014 TBA</p>	<p><b>Class Activity:</b> What are some of the problems and issues regarding methodologies for video data analysis?</p> <p><b>Assignment:</b> Readings and Online Discussion per guiding questions.  <b>(1)</b> Derry et al. (2010). Conducting video research in the learning sciences:</p>

	<p>Guidance on selection, analysis, technology, and ethics. <i>The Journal of the Learning Sciences</i>, 19, 3-53.</p> <p>(2) Powell, A. B., Francisco, J. M., &amp; Maher, C. A. (2003). An analytical model for studying the development of Learners' mathematical ideas and reasoning using videotape data. <i>The Journal of Mathematical Behavior</i>, 22(4), 405-435.</p>
<p>3/31/2014 ON-CAMPUS</p>	<p><b>Class Activity:</b> (1) Discuss advantages/limitations of collecting and analyzing video data; (2) Discuss data collection and inter-rater reliability discrepancies in scoring.</p> <p><b>Assignment:</b> Readings and Online Discussion per guiding questions. (1) Goldman, S. &amp; McDermott, R. (2007). Staying the course with video analysis. In Goldman, R., Pea, R., Barron, B. and Derry, S. (Eds.), <i>Video Research in the Learning Sciences</i>, 101-114. Lawrence Earlbaum Associates: Mahwah.</p>
<p>4/7/2014 TBA</p>	<p><b>Class Activity:</b> Project Preparation</p> <p><b>Assignment:</b> Analysis of full video</p> <p>Write abstract; develop research question(s); draft coding rubric; select critical events.</p> <p>Continue study of dissertation.</p>
<p>4/14/2014 ON-CAMPUS</p>	<p><b>On-Line Activity:</b> Group/Whole class discussion of VMC research projects</p> <p>Guidelines will be posted.</p> <p>Continue study of dissertation</p>
<p>4/21/2014 ON-CAMPUS</p>	<p><b>On-Line Activity:</b> (1) Individual work VMC research projects; <i>abstracts</i> posted for review and discussion; (2) Individual <i>outlines</i> of dissertation studies posted for review and discussion.</p>
<p>4/28/2014 ON-CAMPUS</p>	<p><b>Class Activity: Individual</b> power point presentations of dissertation studies</p>
<p>5/5/2014 ON-CAMPUS</p>	<p><b>Class Activity: Individual</b> power point presentations of individual research projects</p>
<p>5/12/2014 ONLINE ASSIGNMENT</p>	<p><b>All Assessments, Reflections, Final Reports for VMC Research and Dissertation Studies due via submission in drop box on course website.</b></p>

## **Policy on Academic Integrity**

You are responsible for knowledge of and will be held accountable to the Academic Integrity at Rutgers policy found at <http://academicintegrity.rutgers.edu>.

### **Directions to WINLAB:**

WINLAB is located at:

Rutgers, the State University of New Jersey  
Technology Centre of New Jersey  
671 Route 1 South  
North Brunswick, NJ 08902-3390

### **Directions from New Jersey Turnpike (North and South), Newark Airport and New York City:**

Take the New Jersey Turnpike to Exit 9. As you exit the Turnpike, take Route 18 North to Route 1 South. Stay on Route 1 South past Ryders Lane and the entrance to Cook Campus. Once you pass Cook Campus, move to the right lane. The entrance to the Technology Center of New Jersey is 7/10 of a mile down on the right. Exit into the Technology Center and make a left at the stop sign. Follow that road around to the right. You will see the Anthem Institute Building on your right. Continue to the stop sign. Make a right and you will see Building 671 up on the left (with yellow trim). There are no parking permits required for this parking area.

### **Directions from the Princeton Area (South of New Brunswick on Route 1):**

Take Route 1 North. After you pass the Milltown Road exit in North Brunswick, move to the right lane and take the exit for the Technology Center of New Jersey (DeVry Institute). Follow the access road to the light. Make a left at the light to go under Route 1. Make another left at the next light. Follow that road and it will bear around to the right past the Anthem Institute Building. Continue to the stop sign. Make a right and you will see Building 671 up on the left (with yellow trim). There are no parking permits required for this parking area.

### **Directions from I-287:**

Take exit for Route 1 South. Stay on Route 1 South past Ryders Lane and the entrance to Cook Campus. Once you pass Cook Campus, move to the right lane. The entrance to the Technology Center of New Jersey is 7/10 of a mile down on the right. Exit into the Technology Center and make a left at the stop sign. Follow that road around to the right. You will see the Anthem Institute Building on your right. Continue to the stop sign. Make a right and you will see Building 671 up on the left (with yellow trim). There are no parking permits required for this parking area.

### **Directions from Route 18:**

Take Route 18 North to Route 1 South. Stay on Route 1 South past Ryders Lane and the entrance to Cook Campus. Once you pass Cook Campus, move to the right lane. The entrance to the Technology Center of New Jersey is 7/10 of a mile down on the right. Exit into the Technology Center and make a left at the stop sign. Follow that road around to the right. You will see the Anthem Institute Building on your right. Continue to the stop sign. Make a right and you will see Building 671 up on the left (with yellow trim). There are no parking permits required for this parking area.

## ***Selection of Recent Doctoral Dissertations Using Video Data:***

*From Rutgers University*

C. A. Maher, Spring 2014

- Aboelnaga, Eman (2011). *A case study: The development of Stephanie's algebraic reasoning*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Ahluwalia, Anoop (2011). *Tracing the building of Robert's connections in mathematical problem solving: A sixteen-year case study*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Baldev, P. (2009). *A study of urban, seventh-grade students' ideas about linear functions*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Francisco, J. M. (2004). *Students' reflection on mathematical learning: Results from a longitudinal study*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Glass, B. H. (2001). *Mathematical problem solving and justification with community college students*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Kiczek, R. D. (2000). *Tracing the development of probabilistic thinking: Profiles from a longitudinal study*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Halien, William B. (2011). *Tracing students' understanding of instantaneous changes*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Mueller, Mary (2007). *A study of the development of reasoning in sixth grade students*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Marchese, C. (2009). *Representation and Generalization in Algebra Learning of 8th grade students*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Pantozzi, R. (2009). *Students Making Sense of the Fundamental Theorem of Calculus*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Powell, A. B. (2003). *"So let's prove it!" Emergent and elaborated mathematical ideas and reasoning in the discourse and inscriptions of learners engaged in a combinatorial task*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Schmeelk, Suzanna (2010). *An Investigation of Fourth-Grade Student's Growing Understanding of Rational Numbers*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Shay, K. (2009). *Tracing middle school students' understanding of probability*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.

- Spang, K. (2009). *Teaching Algebra Ideas to Elementary School Children: Robert B. Davis' Introduction to Early Algebra*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Sran, Manjit K. (2010). *Tracing Milin's Development of Inductive Reasoning: A Case Study*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Steencken, E. P. (2001). *Tracing the growth of understanding of fraction ideas: A fourth grade case study*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Steffero, Maria (2010). *Tracing beliefs and behaviors of a participant in a longitudinal study for the development of mathematical ideas and reasoning: A case study*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Tozzi, Barbara (2011). *A Study on Middle School Students' Use of Computer Generated Representations As They Solve a Probability*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Uptegrove, E. B. (2005). *To symbols from meaning: Students' long-term investigations in counting*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Walter, J. G. (2004). *Tracing mathematical inquiry: High school students mathematizing a shell*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Warner, L. B. (2004). *Behaviors that indicate mathematical flexible thought*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.
- Yankelewitz, D. (2009). *The development of mathematical reasoning in elementary school students' exploration of fraction ideas*. Unpublished doctoral dissertation, Rutgers, The State University of New Jersey, New Brunswick.

### *From other universities*

- Choppin, J. M. (2004). *How teachers' discourse practices affect student engagement in the context of mathematics reform*. Unpublished doctoral dissertation, The University of Wisconsin, Madison.
- Doyle, J. A. (2003). *Student voice: The influence of complex instruction on fifth grade students' mathematical problem solving performance*. Unpublished doctoral dissertation, Boston College, Boston.
- Goos, M. (1999). *Metacognition in context: A study of metacognitive activity in a classroom community of mathematical inquiry*. Unpublished doctoral thesis, University of Queensland.
- Herbst, P. G. (1998). *What works as proof in the mathematics class*. Unpublished doctoral dissertation, University of Georgia.

- Horn, I. S. (2002). *Learning on the job: Mathematics teachers' professional development in the contexts of high school reform*. Unpublished doctoral dissertation, University of California, Berkeley.
- John, A. S. (2001). *Generalizing in interaction: Students making and using mathematical generalizations in design projects*. Unpublished doctoral dissertation, University of California-Berkeley, Berkeley.
- Larsen, S. P. (2004). *Supporting the guided reinvention of the concepts of group and isomorphism: A developmental research project*. Unpublished doctoral dissertation, Arizona State University.
- Magidson, S. (2002). *Teaching, research, and instructional design: Bridging communities in mathematics education*. Unpublished doctoral dissertation, University of California, Berkeley.
- Martin, L. C. (1999). *The nature of the folding back phenomenon within the Pirie-Kieren theory for the growth of mathematical understanding and the associated implications for teachers and learners of mathematics*. Unpublished doctoral dissertation, University of Oxford, Oxford, England.
- Raman, M. J. (2002). *Proof and justification in collegiate calculus*. Unpublished doctoral dissertation, University of California, Berkeley.
- Seymour, J. R. (2004). *Tracing the evolution of pedagogical content knowledge as interanimated discourses*. Unpublished doctoral dissertation, The University of Wisconsin-Madison, Madison.
- Sherin, M. G. (1996). *The nature and dynamics of teachers' content knowledge*. Unpublished doctoral dissertation, University of California, Berkeley.
- Smith, S. P. (1999). *Children, learning theory, and mathematics: An analysis of the role of language and representations in children's mathematical reasoning*. Unpublished doctoral dissertation, Michigan State University, East Lansing.