

M500A – Syllabus Fall 2007

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Office hours: MW 4:30-5:30
M 8:30-9:30pm

Required Materials:

Sowder, J., & Schappelle, B. (Eds.) (2002). *Lessons learned from research*. Reston, VA: National Council of Teachers of Mathematics.

Ma, L. (1999). *Knowing and teaching elementary mathematics: Teachers' understanding of fundamental mathematics in China and the United States*. Mahwah, NJ: Lawrence Erlbaum.

Addition course readings will be made available at no charge through D2L (<http://d2l.arizona.edu>)

Course Goals:

In this course, you will:

- gain knowledge of key research studies and findings related to student learning of mathematics
- develop your ability to read and synthesize research, and to apply research in your own classroom context
- examine an area of research of your choosing in greater depth
- become familiar with basic research methodologies
- engage in scholarly writing and further develop writing skills

Course Overview:

In this course, you will study research on student learning of mathematics with a focus on implications for classroom practice. Topics include number/operation, algebraic reasoning, geometry and measurement, mental computation and estimation, and data analysis and probability. We will also examine research related to pedagogy and curriculum as they influence student learning of mathematics. The course is organized into three parts. In part 1, we will examine “big issues” that cut across discussion of the learning of specific mathematics content. Topics for this part of the course include student motivation, the learning of concepts and procedures, types of mathematical tasks, and the role of culture in mathematics learning. Part 2 of the course will focus on research on selected middle school mathematics content, including rational number, geometry, and algebraic reasoning. During the final part of the course, we will return once again to broader topics related to student learning, including equity and mathematical knowledge for teaching. The readings for the course are organized so as to allow time for you to examine a topic of your choice in greater depth (see the Major Assignments section of the syllabus).

Policies and Grades

Attendance and in-class participation in activities and discussion is required; this is reflected in the “homework, readings, and class participation” section of the Grading Policy (see below). Missed or late assignments will result in a grade of zero unless I agree to other arrangements in advance.

Grading Policy

Homework, Readings, and Class Participation = 25%	A = 90-100%
Task-Based Interviews and Presentation = 25%	B = 80-89%
Article Synthesis = 10%	C = 70-79%
Literature Review (including bibliography) = 40%	D = 60-69%
	F = 50-59%

Major Assignments:

Literature Review (and Article Synthesis)

For this assignment, you will examine a set of 8-10 journal articles and/or book chapters on student learning related to a middle school mathematics content area of your choosing. These articles can be a combination of reports of original research (at least five), “research-into-practice” pieces, and reviews of research. The literature review is not intended to be an article-by-article report of findings, but rather a synthesis of the research that integrates the perspectives in the articles/chapters into a coherent whole. In class, we will discuss various ways to organize the review (e.g., by mathematical concept, by theoretical orientation). The creation of the literature review will begin with the development and submission of a bibliography listing the articles/chapters that will be discussed in the review. An “article synthesis” of three of these articles/chapters (expected length 4-6 pages, double-spaced, 12 points font, 1-inch margins) will be submitted mid-semester. This will provide an opportunity for feedback and suggestions about the review. Much of the article synthesis will likely be able to be used as part of the literature review. The literature review will be due at the end of the semester (see Tentative Syllabus). On the last day of class we will have time for informal sharing of findings about student learning from each student’s literature review. Expected length of the literature reviews is 15-20 pages (double-spaced, 12 points font, 1-inch margins).

Task-Based Interviews and Presentation

For this assignment, you will develop an interview protocol related to your focal topic. Protocols will be developed in small group with other students who have similar (although not necessarily the same) focal topics to your own. Next, you will use your protocol to interview 4-6 students. The students can be, but do not have to be, students in your own classroom. With others in your small group, you will analyze student work collected during the interview. Finally, you will, as a group, present the protocol and results to the whole class. Presentations will be approximately ½ hour in length and should include information about the entire data set as well as an opportunity for the class to look closely (albeit briefly) at an interesting piece of data.