

CHILDREN'S THINKING IN MATHEMATICS EDUCATION

EDST 621 - Fall 2004

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The mission of the College of Education Community is to collaboratively transform public education by preparing thoughtful educators and advancing professional practices. We are committed to diversity, educational equity, and social justice, exemplified through reflective teaching, life-long learning, innovative research, and ongoing service. Our practices demonstrate a commitment to student centered education, diversity, collaboration, professionalism, and shared governance.

SUGGESTED COURSE MATERIALS & RESOURCES:

- Carpenter, Fennema, Franke, Levi & Empson (1999). Children's Mathematics: Cognitively Guided Instruction. Heinemann (Publisher).
- Carpenter, Franke & Levi (2004). Thinking mathematically: Integrating arithmetic & algebra in elementary school.
- Developing Mathematical Ideas (DMI) materials (to be discussed in class).
- Fosnot, C. T. & Dolk, M. (2001). Young Mathematicians at Work: Constructing Multiplication and Division (also has "Constructing addition and subtraction" and "Constructing fractions, decimals, and percents")
- Ashlock, R. B. (2002). Error patterns in computation: Using error patterns to improve instruction.
- Additional articles will be assigned in class

COURSE DESCRIPTION:

In this course, we will investigate the broad field of children's content specific thinking in mathematics education as well as become familiar with the related major areas of research. More specifically, this course will examine: (a) the benefits and challenges of using children's content specific thinking, (b) the developmental trajectories that students pass through as they come to develop an understanding of specific mathematical ideas, (c) the understanding of mathematics that students bring with them to class (including realistic contexts), (d) common student misconceptions in mathematics, and (e) how educators can support teacher change by making use of children's content specific thinking.

PROFESSIONALISM:

As a professional in the field of education, you need to take seriously your responsibility for learning and helping others learn in this class. As a professional, you should:

- attend all classes
- arrive on time and remain for the entire period
- be prepared for each class by having thoughtfully completed all readings and assignments
- keep me informed of any extenuating circumstances in your life that may hinder your ability to succeed in this course
- remain on task during class sessions
- respect others' opinions in the class
- be curious about ideas different than your own

Since it is expected that everyone will act professionally in all class sessions, final grades will be lowered up to and including 10% for an unprofessional attitude or behavior (including lack of or inappropriate participation). Arriving late, leaving early, or skipping classes will be interpreted as lack of participation (please also see COE Attendance Policy below)

I take very seriously the idea that our class is a community of learners. It is important that everyone feels both encouraged to participate and a responsibility to participate. All ideas are welcome including those that are different than my ideas and those of the majority of the class. Only through explorations of multiple perspectives will we be able to really address the complex issues of teaching and learning mathematics.

COE ATTENDANCE POLICY:

Due to the dynamic and interactive nature of course in the COE, all students are expected to attend all classes and participate actively. At a minimum, students must attend more than 80% of class time, or s/he may not receive a passing grade for the course at the discretion of the instructor. If you miss two class sessions or are late (or leave early) more than three sessions, you cannot receive a grade of "A". If you miss three class sessions, your highest possible grade is a "C+". Should you have extenuating circumstances, contact the instructor as soon as possible. Please discuss with me any extenuating circumstances that will cause you to miss class prior to your absence. Attendance will be taken at each class session.

ASSIGNMENTS:

All written assignments must be typed and double-spaced. Each assignment is due on the date indicated on the syllabus, and grades on late assignments will be lowered unless **prior arrangements** have been made with the instructor.

Assignment	% of Grade	Due Date
1. Attendance, Class Participation and Homework Assignments	10%	On-going assessment.
2. Reading Reflections	30%	Due sessions 6, 11, and 16.
3. Interviews and Analysis	20%	Session 8 (TBD)
4. Content Investigation Project (by grade level or interest)	20%	Session 13 (TBD)
5. Misconceptions Analysis	20%	Session 16 (TBD)

GRADING SCALE:

Grades will be based on the following grading scale:

- A.....90 -100%
- B.....80 - 89%
- C.....70 - 79%
- D.....60 - 69%
- F.....Below 60%

PLAGIARISM AND CHEATING:

Please be sure to read and understand the university policy on plagiarism and cheating as it will be strictly enforced. Academic dishonesty will not be tolerated and will result in a failing grade for this course and will be reported to the University.

DATE **TOPIC & ASSIGNMENT DUE *ON THAT DAY***

Session #1 (9/1)

COURSE INTRODUCTIONS AND PLANNING

Session #2 (9/8)

DEVELOPING AN UNDERSTANDING OF MATHEMATICS

Session #3 (9/15)

CHILDREN'S MATHEMATICAL THINKING: CGI

Session #4 (9/22)

IMPORTANCE OF ASSESSMENT

Session #5 (9/29)

CONTEXTS FOR DEVELOPING MATHEMATICAL UNDERSTANDING

Session #6 (10/6)

DESIGNING ASSESSMENTS

Session #7 (10/13)

DMI INVESTIGATIONS (Place Value)

Session #8 (10/20)

DMI INVESTIGATIONS (Second Topic)

Session #9 (10/27)

CONTENT AREA INVESTIGATION

Session #10 (11/3)

CONTENT AREA INVESTIGATION

Session #11 (11/10)

MAKING CONNECTIONS WITHIN MATHEMATICS

Session #12 (11/17)

MAKING CONNECTIONS WITHIN MATHEMATICS

Session #13 (11/24)

INDEPENDENT RESEARCH (ON YOUR OWN...)

Session #14 (12/1)

MISCONCEPTIONS

Session #15 (12/8)

MISCONCEPTIONS

Session #16 (12/15)

MISCONCEPTION PRESENTATIONS

*** Misconception papers DUE TODAY**