Teaching and Learning in Mathematics: Inquiry

“A question is more spacious than a statement, far better suited to expressing wonder.”
Marilynne Robinson

What is this course about?

Students’ responses

- perspectives of both learner and teacher to develop own world view
- active student involvement and participation
- personal research
- analyzing teaching by looking closely at what we believe or have experienced and at what others believe and have experienced
- finding out, developing, questioning
- this course is not about dictating the right way to teach and learn, and it is not about coming up with a solution, not only to the math problems [we do in class] but to our more philosophical questions about teaching and learning
- understanding and appreciation of different ways people (students) learn math.
  - how we learned--Dewey's reflective thought our eventual goal for learning
  - how different ages and different groups are taught and the skills they try to develop in math
  - take these ideas and mold/develop an effective teaching strategy
- it’s really about understanding the learners’ needs and how they learn, then finding the most effective way to teach those learners
  - allows for discussion and assimilation of ideas about teaching in a pedagogical, social, and cultural context
  - people with a variety of backgrounds and experiences adds to our learning as students
  - seeing and reading about ideas on teaching math from other cultures beneficial
- investigating the assumptions we make about students and rooting out the inaccurate ones
  - methods for attempting to determine what a student is thinking
  - examples of pitfalls and stumbling blocks that both students and teachers experience during the learning process
  - trying to make us think about what we do while we teach
- about different aspects of learning--how students think, how we as teachers can promote learning
  - to understand how others learn we have sought to verbalize and examine how we think
  - looked at methods or styles of teaching that may encourage students to perform reflective thinking
  - clinical interview process to evaluate learning and understanding of material
  - about awareness in a teaching environment--awareness can facilitate learning
- Designed to broaden knowledge base for future mathematics/mathematical sciences teachers in areas of how knowledge is acquired, dispersed, and internalized with some emphasis on the variations of cultures, age groups, and socioeconomic status.
- Discussion, exploration, thinking, and laughing.
- Exchange ideas and bring up new ideas, go into detail of some issues and come up with ideas you never thought it might be; study Dewey to think about our own thinking and therefore we have a chance to know what and how others are thinking, always fun.

**Teacher’s response**

This class is intensely interesting to me because it opens up space and time for students to come at their goal of teaching mathematics from the standpoint of learning—their own and others’ learning of mathematics. We work classically simple but cognitively challenging problems. Then we use a variety of techniques to externalize our thinking through trialogue. In class we try out inquiry approaches to mathematics, and we see how far we can go in our questioning. The students have come to appreciate each other’s views of the field of mathematics and their mathematical style. The differences in approaching problems, even in this small and somewhat homogeneous group, have helped to drive home the importance in teaching of listening to learners and respecting their starting points and their kinds of mentality. This does not mean that we abandon the responsibility of teaching. We believe along with one of our mentors, Dewey, that reflective thinking has to be learned, and we can see the importance of logical and reflective thinking in mathematics. But insisting that we start from and return to the learner, in addition to the normative, canonical curriculum, has led us to question what we mean by “basic” or “fundamental” skills. We are reading various approaches to research in learning and teaching mathematics and engaging in limited field work. We study videos of clinical interviews, classroom lessons, and group work. We continue to engage in productive disagreement, and we do come up with ideas we never thought might be.