**Combining Tools to Facilitate Blended Collaboration in Mathematics**

### Context
- **Wiki**
- **GeoGebra**
- **Jing**

### Course
- **Principles of Mathematics, Grade 10, Academic (MPM2D)**
- **Participants**: 23 students: 11 male, 12 female
- **General Pearl High School, Petawawa, Ontario**

### References
- comScore. (2011). It’s a social world: Top 10 need-to-knows about social networking and where it’s headed. Toronto: OAME.

### Research
- "Students need the opportunity not only to hear what the teacher is teaching, but actually converse and articulate their own understanding of the content being presented" (Piccolo, Harbaugh, Carter, Capraro & Capraro, 2008, p. 404).

### Professional Vision
- "Communication is an essential part of mathematics and mathematics education. It is a way of sharing ideas and clarifying understanding. Through communication, ideas become objects of reflection, refinement, discussion, and amendment" (NCTM, 2000, p. 60).

### Ontario Mathematics Curriculum Policy
- "Communication is an essential process in learning mathematics. Through communication, students are able to reflect upon and to clarify ideas, relationships, and mathematical arguments" (Ontario Ministry of Education, 2005, p. 16).

### Phase 1: Setting up the classroom environment
1. Developing a "math-talk learning community" (Hufferd-Ackles, Fusi & Gamoran-Sherin, 2004).
2. Introducing the wiki with students visiting the site for course information.
3. Using GeoGebra in class to present mathematics.

### Phase 2: Posting mathematics text to wiki pages
Students post a word problem and an algebraic model in text to their own pages on the wiki.

### Phase 3: Embedding GeoGebra applets on wiki pages
Students create a GeoGebra animation and record this in a Jing video that is posted to the wiki as a Seasons’ Greetings card.

### Phase 4: Embedding Jing videos on wiki pages
Students return to their original problem and post a graphical model using GeoGebra.

### Phase 5: Commenting on each others’ work
Next step is to conduct discourse analysis of student wiki contributions and look for evidence of growth in understanding.

### Phase 6: Combining skills in a collaborative exploration
1. Developing a "math-talk learning community" (Hufferd-Ackles, Fusi & Gamoran-Sherin, 2004).
2. Introducing the wiki with students visiting the site for course information.
3. Using GeoGebra in class to present mathematics.

### Findings, Implications, Questions & Future Research
- Need to cater to wide range in Internet experience, skills and motivation
- Enthusiasm and engagement increased when the class had more computer access and developed experience and comfort.
- Assessment – Can we expect work to be presented via the Web?
- Next step is to conduct discourse analysis of student wiki contributions and look for evidence of growth in understanding.