

## STLF Report to CWSEI and Mathematics Department

**STLF:** Sandra Merchant

**Period:** 16/04/10 – 30/04/10

**Submitted:** 30/04/10

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### Specific activities performed by STLF

#### 1) Professional development

- Attended the weekly Reading Group discussion (Apr. 20)
- Attended the CWSEI End-of-Year event. (Apr. 27)
- Attended the weekly STLF meetings (Apr. 29)

#### 2) MATH SEI general meetings/activity

- Attended the weekly Math-CWSEI meetings (Apr. 16)
- Met with the Math-CWSEI group and department head to discuss draft timelines for the coming year (Apr. 26)

#### 3) Course-specific meetings/activities

##### Tracking Proof Skills Project (MATH 220-Mathematical Proof and subsequent courses)

1. Developed a draft timeline for this project for the time period May 2010 - April 2011. This timeline will be refined over the next few days and is to be presented at a Math department STLF/FM meeting next week (May 4).
2. Together with the other members of the Math-CWSEI group, Fok-Shuen Leung and Djun Kim, we organized and hosted a “proof discussion lunch” (Apr. 21), where faculty, grad students and post-docs were invited to hear a summary of student difficulties with proofs (presented by myself and based on my faculty interviews so far) and participate in a discussion about these difficulties and teaching techniques that effectively teach proof skills (discussion was moderated by Warren Code). Attendance was quite high (~25 attendees, 6 faculty with the remainder made up by grad students and postdocs) given the time of year and there was a lively discussion about the types of difficulties students had and what role proof does and should play in the curriculum. The discussion revealed that there is a high level of interest in improving the way proof is currently taught in Math 220, but there were very disparate views on the best approach for doing this (including changing the content base on which proof is taught, to splitting the course into two terms/different courses, or adding extra tutorials or workshops). Also, we unfortunately did not discuss effective teaching methods much, in part due to running out of time, but also perhaps because there were no highly successful innovations known of by the discussion members. I will follow up on this in my faculty interviews.
3. Met with Andrew Rechnitzer (Apr. 28), the faculty member involved in the transformation of Math 220 as well as instructor of this course in 2010W – Term 1, to begin planning for the project. Our plans at this time are still in flux, but we are presently planning 4 major items to implement in Term 1: (1) course-level and topic-level learning goals (to be written over the summer) (2) a diagnostic test, to be administered at the beginning and end of the term, to pinpoint areas of difficulty and assess learning achieved through the term. (3) in-class exercises on each topic and during each class (the proportion of class time these activities will

comprise is still being determined). (4) interventions with students with low performance on the first midterm (how this is to be done still needs to be determined).

4. With assistance from Costanza Piccolo and Andrew Rechnitzer, reviewed and revised the end-of-term survey. This survey has now been set up online and students from both this term (2009W-Term 2) and the previous term (2009W-Term 1) will be contacted next Monday (May 3) to be invited to take the survey, as well as invited to be interviewed about their experience in Math 220. We plan to send a reminder May 10<sup>th</sup> and close the survey May 13<sup>th</sup>.
5. Continued my comparison of 300-level Math courses to determine the most fruitful directions for future study. As suggested to me by Carl Wieman, I have compared student composition (ie. honours vs. non-honours students) as well as studied the correlations between grades in Math 220 and those in various 300-level courses. There are a number of interesting results from this analysis as well as some potential problems it brings to light regarding my intended future plans. This analysis is nearly finished, and I will write a separate report relaying the results.

### **Current Project Status (material was prepared by either STLF or other members of the MATH SEI group)**

MATH 220:

**Learning Goals:** Faculty interviews are in progress to compile suggestions for course-level learning goals.

**Assessments:** None. A literature review is underway to determine meaningful scoring/coding schemes for proof problems.

**New Methods/Materials:** The end-of-term survey has been revised and will begin May 3

### **Plan for immediate future work**

MATH 220:

1. Continue faculty interviews (remaining Math 220 instructors, and instructors of Math 308, 312, 320, 322, 342) for input into course-level learning goals, as well as to determine the amount of proof in the 300-level courses.
2. Attend the summer session section of Math 220 (May 10 – July 30) to aid in developing course-level and topic-level learning goals, as well as generate ideas for class exercises in the fall term.
3. Administer the end-of-term survey, analyze and summarize the results.
4. Establish interview questions and protocol to be used for student interviews. Conduct these interviews (assuming there are some volunteers).
5. Complete the analysis of 300-level courses and summarize the results. Based on the results, make plans for what activities are to be performed on 300-level courses in 2010W (both terms).
6. Continue literature survey of proof skills – with a focus on assessment of proof skills, (specifically – how to categorize student difficulties and code errors)
7. Begin looking at past final exams to identify common student errors.