STLF Report to CWSEI and Mathematics Department

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Presentations, etc.

1. I presented "Do we know how students view math and how they study it?" in the math department's first Lunch Series on Teaching and Learning on 28/10/2014. The session was well-attended, including some STLFs from other departments.
2. Four of four presentation proposals for the Joint Mathematics Meetings in January have been accepted:
   i. An Evalutation of a Flipped Calculus Class.
   ii. Developing Flexible Derivative Procedures.
   iii. Do We Know How Students View Math and How They Study It?
   iv. Seeking Mathematics Success for Community College Students: A Randomized Field Trial of an Adapted Approach.
3. This week, I have arranged two visitors to the department: Asia Matthews from Queen's University and Bill Barton from the University of Auckland.

Current Work

1. Math 102 Flipping Study.
   i. I have been busy making the last of the videos and coordinating the pre-lecture quizzes with the videos.
   ii. The second round of COPUS observations are taking place this week. Preliminary analysis indicates that two section are accurately described as traditional lectures and four as using interactive engagement techniques extensively. The remaining section is a borderline case; some interactive engagement is present, but this section is perhaps more accurately classified as a lecture.
   iii. The MAPS survey will be made available to the students on Wednesday and the Calculus Concept Inventory will be run in the sections starting Friday.
   iv. Problems arose when analyzing the first round of CCI data: the grey bars behind the rows of bubbles are mistaken for responses by the ProMark software. Megan Barker has suggested a fix that is currently being evaluated.

2. Developing Flexible Derivative Procedures study.
   i. All data collection has been completed and an analysis is underway.
   ii. The results are favourable: The percentage of questions solved by first simplifying, or modifying the function in some way, went from 4% on the pre test to 15% on the post test in the treatment section. In the control section, the percentage of simplify-first solutions stayed roughly constant at 5%. A justifiable conclusion is that flexibility in derivative-finding procedures does not arise spontaneously. Another possible conclusion is that students do not view modifying the question before differentiating as a permissible approach. There is some evidence this is likely. However, student work from the control section assignment seems to support the first conclusion.
   iii. The 'solution profiles' – the proportions of types solution methods – from the two sections warrants further analysis. Simplifying/modifying questions aside, the control section solved the problems, on average, differently than the treatment section, on both pre and post tests. They were more likely, for example, to first write the relevant derivative rule and component functions. In light of the lower quiz averages for the control section, this difference in solution profiles should be investigated.