I. The Project
Original Proposal
Problem:
For the second year the Department of Mathematics and Statistics has been teaching a pilot program of Workshop Calculus. In addition to the regular 4 hours of lecture per week, students have two one-hour workshops in which they work in groups of 3 or 4 at a round table and solve more difficult, sometimes open-ended, problems that have been created by their professor. The first group of faculty who taught the workshops in fall of 2001 underwent a full day of training facilitated by other faculty in the department who had some limited experience in collaborative group work. Since then, no formal training has taken place, although many additional faculty now are teaching in the Workshop Calculus sequence. Faculty handle the workshops in a variety of ways:
- Some try to facilitate group learning at each table
- Some faculty sit at another table and do work while occasionally answering questions that students have
- Some faculty rely totally on their TA to answer student questions
Most faculty, myself included, feel that the workshops could be more successful if we had better strategies for this type of cooperative/active learning. Students usually try the “divide and conquer” method of solution - assigning each member of the group a separate question to solve. Most of us have never done this type of activity and are not comfortable relinquishing the “power” in the classroom.

Plan for Winter Quarter 2002-03:
Based on reading and attendance at the Lilly Conference I will be trying various strategies in my Calculus II workshop sessions to better facilitate student learning. These include, but are not limited to:
- Rotating group members
- Assigning a leader within each group who is responsible for ensuring that all group members discuss each problem
- Putting some workshop problems (in simplified format) on hour exams.
- Attempting to be less of a teacher and more of a guide in the workshops
- Asking one group to teach the class how to solve a problem

**Method of Assessment**
- I will keep a journal of successes and failures in each workshop
- I will see if there is an increased desire to understand the workshop problems after the first hour exam (which contained two workshop problems)
- I will ask for some 1 minute papers at the conclusions of a lecture class and then again at the conclusion of the workshop which immediately follows and reinforces the classroom material

**Final Presentation of Project**

**Increasing Active Learning in Workshop Calculus**

- Workshop Calculus is in 2nd year at RIT
- Students work in small groups to solve more in-depth problems
- Faculty have no prior experience as workshop leaders
- Need to improve my performance as workshop facilitator
- Need to assist students to become active learners in group work

**Goals/Objectives**
- Promote active learning
- Promote shared group work
- Overcome the “divide & conquer” method of approaching group work
- Have students discuss mathematical methods
- Learn to be a better workshop facilitator

**Implementation**
- Rotate group members
- Assign a leader in each group who is responsible for ensuring that all group members discuss each problem
- Put some workshop problems (in simplified format) on hour exams.
- Practice being a guide, rather than lecturer in workshops
Preliminary Results

- Students quarter reported that workshops in winter were a vast improvement over fall quarter
- After first instance, students take seriously that workshop problems appear on tests
- Students ask questions in class about workshop problems

Future Plans

- Will be teaching workshop calculus in fall, providing another opportunity to try out techniques
- Will offer colloquium to department faculty on successful workshop techniques

II. Reflections

On Project

My project was important to me on several levels:

1. It addressed an area of teaching that I perceived as a personal weakness. I had not had a "bad" teaching experience in many years, but I did not feel totally successful as a workshop facilitator in the new calculus sequence.
2. The problems I experienced were larger than just my own. The issue of facilitating "good" workshops was a departmental problem.
3. The issues I had raised were part of the departmental plan of work.

I could have done a better job at including my faculty colleague and student associate in the project. Probably my own insecurities prevented me from including them more than I did.

On a more positive note, I believe that the work I did on the project will continue this coming academic year, and will make participating in teaching the Workshop Calculus sequence much more palatable. I also believe that I have the resources among some of my fellow FLCers to seek guidance and help if needed.

On FLC experience

Participating in FLC is unquestionably one of the high points of my teaching career. Without a fixed obligation, I would never have set aside two hours every other week to discuss teaching issues. I feel that I developed a strong rapport with other members of this year’s FLC class and that I could discuss any and all classroom issues with them. Most helpful for me were sessions in which we addressed specific problems we were having in the classroom, I highly recommend that every faculty member have such an experience once (or more
often) in his/her career. Being part of a faculty learning community is as valuable as a sabbatical (although not as restful, and probably not as productive).

Metaphor for Teaching
My metaphor is that, as a teacher, I am like a Chassidic Rabbi. A Chassidic Rabbi is charismatic, warm, inviting, and gives just enough knowledge on first encounters to entice you to want to learn more. Such a Rabbi is a teller of tales—especially in answer to questions. This does not mean that the Rabbi will not answer the question, but with a good story you will remember the answer better.

Teaching Philosophy
Any college student can learn a subject (in my case mathematics) at some level of competency. My job is to ensure that every student reaches his/her maximum level of competency. Their learning and my teaching should be exciting, dynamic, and fun. Becoming competent at mathematics requires participation. A student cannot learn by watching me do a problem. On the other hand, many students cannot work within a “discovery learning” environment and need to observe certain mathematical procedures before attempting them on their own. Again, my job is to find the right balance of lecture, group work, discovery learning, guided learning, etc. that will benefit the greatest number of students.

Comments on Articles/Books
Many of the articles and the two books (Classroom Assessment Techniques and Teaching Tips) were enjoyable and helpful. However, for myself, most learning occurred during our group discussions. Each member of the community was helpful in his/her own way. For instance, although Jessica did not have much experience as a new teacher, she brought fresh insight to those of us who had been teaching more than twenty years. I think the mixing of junior and senior faculty was an excellent idea. The books and articles were a jumping off point—a mechanism to give us some common ground on which to begin a discussion. In this sense they functioned perfectly—their actual content was less important than their ability to provide some structure in our initial discussions. Clearly by the second quarter we needed no such structure.

Journal Excerpts
In all honesty I did not keep a journal, except in my head. This is an honest reconstruction of the thought process I went through during the course of the year.

September
Why did I ever decide to do this? Don’t I have enough on my plate already???? Am I nuts? Well, some of the people seem nice and maybe I’ll get something out of it. The reading seems pretty cliché. Boy I’m bitchy. Maybe I’m just not into sharing. This touchy-feely stuff is not my forte.
Boy, this is better than I could have imagined. Why was I so reluctant initially? Maybe I just didn’t trust that people would be open and sincere... but they really are. I have no idea what I want to do for a project, but I better relate it to the department or I'll get no internal support. I'm still not wild about the Teaching Tips book (maybe I've just taught too long), but at least it gives us a point to start discussions from.

October
What a great group of people!! I’m really getting help, especially with a MOST difficulty student in my Seminar class. My group members are the absolute best – if Sue splits us up and mixes the groups for winter quarter I’ll just quit! Ok, I won’t quit, but I’ll be really unhappy. We’ve developed such a good rapport and such a sense of trust - it doesn’t seem fair to split us up. Of course, I’m assuming the other group shares the same sense of camaraderie and trust that we do. Oh well, go with the flow, everything seems to have worked out so far and I had no great expectations in the beginning.

November - Lilly Conference
Great experience - fun to see all the FLCers together. Maybe being in a new group won’t be so bad. Some workshops at Lilly didn’t live up to my expectations, but most were good. Must be that jaded, 25 year teaching thing again. It’s hard to get excited about something I’ve done for so long. I definitely could use an attitude change (or maybe just some more coffee). Maybe I’m just tired from the end of the quarter. Wow, I’ve finished grading all my exams, but Mao, who had to bring his exams with him, has more enthusiasm than I do. Something is very wrong here. I must need more sleep. Maybe I need to retire. Maybe another trip to Starbucks.

Then the trip home – we really did become a family. Everyone worried about Sid. They great “gal” conversation in Sue’s car returning to the airport. I’m so lucky to have met all these people and to have made them my friends. I promise not to whine any more about how tired I am of teaching... or at least not as much.

December/January
Time to formulate the project. Can I really pull this off? I need to start doing it. UGH! I hate trying new things.

Hey this isn’t so bad. The kids are responding pretty well to the new workshop rules... even the kids I had fall quarter, when things were really loose. Maybe this is going to work.

February
Actually doing the project! Workshops are better than they’ve ever been. I’m really glad that I tried this. It isn’t as if I’ve made major changes, but even these little changes seem to have had quite an impact on the course. Oh yeah, my new group is great, too. Why was I so worried about rotating people? I think this
is so cool – having wonderful colleagues to talk to, bounce ideas off of, and receive honest criticism from. Too bad everyone doesn’t have opportunities like this. Sue and Vinnie are really to be commended for thinking up such an idea and for carrying it through two years in a row. They are the best!!!!

March/April
Much of a blur as we get ready to do presentations. Wow, not only was the Provost there, but my chair came!!!! I’m impressed! Everyone did a great job. We accomplished a lot in one year. I hope the Provost thinks he got his money’s worth, because HE DID!!!

May
Wish this group didn’t have to end. Which group? I’ve been in three different ones and they have all been great. I know certain people will remain close colleagues. I never would have gotten to know the people outside of my college, if not for FLC. A huge THANK YOU to Sue and Vinnie for giving us such a wonderful year.