Impact Grant Project: Questionnaire for Instructors   Name ___Ian Leary_____

Lessons learned from teaching with various technologies.

How frequently did you use the following technologies?						
1- Never, 2- Once or twice, 3- Occasionally- More than 3 times, but less than half the time, 4- Frequently – More than half the time, but not always, 5- Always	1	2	3	4	5	n/a
For lecture preparation:						
Slides	x					
Clicker Questions				x		
SmartNotebook Math		x				
In class						
Sympodium					x	
Internet				x		
Twitter				x		
Camtasia to record lectures					x	
Clickers	x					
Applets				x		
Other						

Software used	**Camtasia, Smart Notebook, Java, Mathematica, Firefox, Acrobat Reader**

Learning outcomes: In your opinion (i.e. ignoring student poll data), which technology had the greatest impact on student learning in your course?

The pdf versions of the lecture notes *exactly as I had written them* were available online very shortly after the lectures. Combined with the pdf version of the skeletal notes, which was available before the lectures, this made an excellent learning tool. The lecture videos (my voiceover plus the displayed notes as I wrote them) were obviously very useful, but didn't appear until around 48 hours after the lectures, reducing their value.

Challenges: What problems came up while implementing your new technology ideas? Were you able to address these issues during the course? What unanticipated positive outcomes occurred while implementing your new technology ideas? How did you leverage them during the course?

Initially, the computers in lecture rooms EA160 and EA170 were not able to satisfactorily handle the combined load of Camtasia (= the video capture software) and SMART notebook (= the software for displaying and storing the images of the lecture notes). This was solved eventually (around 2/3 of the way through the Autumn quarter) by upgrading these computers (I think that they got new video cards, but I can't remember). In any case, this made a massive difference to the quality of my lectures, since I was suddenly able to get all the software running long before the start of the lectures.

Feedback: Comment on the quality of the student feedback as a result of using various technologies. As a result of this feedback, how did you adjust your instruction?

On the whole, the students were very positive about the technology, although whenever anything went wrong with the lecture they assumed that I was to blame. One thing that I did change significantly as a result of feedback was that initially the students found that I flitted about between pages of the notes too much. The change that I made was to try to change pages less often, and more crucially to cut and paste some material from the end of one page onto the start of the next when appropriate. (Another solution would be to extend the length of the pages, but I preferred to keep the pages to a standard size, which meant that I could use the full screen display mode.)

Teaching:	Compare your experience of teaching this technology enhanced course to teaching a standard math course that is similar in content. Comment on prep time, technology training, student engagement, etc. From a pedagogical perspective what aspects of your teaching were significantly impacted by using this additional technology?

Before starting the project, I was nervous that lecturing in this way would involve a far greater time commitment than ordinary chalk-and-talk lectures. However, once the initial slides and clicker questions had been prepared, the time commitment was about the same as for a standard lecture. The time that was put in to preparing the slides was a large time commitment, mainly by Elizabeth Miller, but presumably less time will be needed for slide preparation in subsequent years; moreover if many lecturers were to use this system rather than just two of us, the slide preparation time would stay the same. Similarly, I put a lot of time into the clicker question preparation (although far less than Elizabeth Miller put into the slides) but hopefully these questions can be reused in future years with only mild modifications.

I think that the students on the whole preferred these lectures to my more conventional chalk-and-talk lectures. My main complaint is that I did not very much exercise by writing on the Sympodium, whereas writing on a chalkboard at a size that can be read by 160 students is quite physically tiring. Slightly less frivolously, the Sympodium screen is a lot smaller (in terms of how much one can write on it) than a chalkboard. Prepared slides could have detail on them far smaller than it was possible to write during the lectures. If I were to give a course using the Sympodium but without prepared slides, I think that I would find it hard to fit as much material as I would like on to each page.

Moving Forward:	What is your opinion about teaching this technology enhanced course again in the future? Please comment on additional improvements you believe are needed and what aspects should remain the same.

I think that in ten years time, many large courses will be given using the Sympodium instead of chalkboards. I would like to see a larger writing area (larger compared to the smallest writing that can be done on it, not necessarily physically larger). At present the Sympodium would not work quite so well without prepared slides.

I would be very happy to teach a course using this technology again. The only part of it that I have felt slightly negative about is that I feel that we maybe had too many Java/Mathematica applets. Some of the applets helped to give a feel for the material that we were presenting, but others just seemed to disrupt the flow of the lecture. Also some of the applets ran rather slowly, and could not be adjusted by the lecturer. If an applet cannot be adjusted and is going to run slowly, then maybe it makes more sense to show a short video of the same material rather than strain the computer by running an applet.

Last quarter's experiment was marred by the slow computers in the lecture rooms, which made giving the lectures very stressful for the first couple of months (until the computers were upgraded). I think that I will be better able to address the question of what else needs to be done to improve this method of teaching at the end of this quarter.