

Final Report  
Academic Technology Grant 2006-7  
“Integrating Tablet PCs into a High Enrollment General Education Course”  
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Project category: Professional Development Grant

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Campuses and disciplines involved: UMass Amherst, Biology department

**Background:**

Funding from this grant enabled the PI to purchase two Lenovo X41 Thinkpad Tablet PC laptops, plus associated software, for use in his annual course “The Biology of Social Issues”. The PI’s interest in Tablet PCs as a teaching tool was motivated by a pair of seminars attended by the PI during his Lilly fellowship, presented by Drs. Richard Rogers and Tillman Wolf of UMass Amherst. When working properly, Tablet PCs allow one to “ink” directly over images transmitted from the computer, using a stylus that draws onto the computer screen. For instance, one can label projected images or add words to powerpoint slides. Each time I use this technology in a new class for the first time, I hear audible gasps, partly in reaction to the technology but also, I think, in the joy of watching powerpoint slides be subverted by spontaneous and messy scrawl.

There are at least three concrete advantages in using tablet technology. First and most importantly (in my view), use of inking allows one to inject spontaneity into otherwise “pre-packaged” powerpoint presentations. That is, through inking one can adjust or supplement presented images with words or drawings that arise in discussion, e.g. as emerging from student comments. Tablet computers are thus many a science teacher’s dream – allowing one to mix projection of images with blackboard-style explication. Overly packaged lectures put students to sleep, whereas spontaneity keeps them awake and active. Second, use of tablets helps to avoid distracting in-class transitions between different modes of presentation, e.g. overheads versus computer projection versus blackboards. Such distractions are sometimes welcome by students but they can often disrupt the course of a lecture. Third, with Tablet PCs one can save inked annotations, which is tantamount to being able to photograph one’s blackboard efforts. This can help one to reconstruct lecture conversations and thus identify and clarify possible points of confusion.

**Application:**

Computers were purchased in Fall 2006, and introduced into the classroom in Spring 2007, after some troubleshooting with the operating system and software (aided by the UMass Biology department's information technology department). The main course in which the Tablets are applied is Biology 105, "The Biology of Social Issues", for which the PI has now been an instructor for 6 years. This course meets a UMass general education science requirement, and thus attracts many students. Nominal enrollment is 400, but we always let in 460-470, up the legal limit allowed by the Fire Marshall for the teaching venue (Mahar 108). This is a team-taught course, and with 2 working laptops it becomes possible for the "on deck" instructor to develop lectures and expertise with the Tablet technology while the other unit is in use in the classroom. We have no Teaching Assistant help for this course, and thus no opportunity for discussion sections. Clarity and engagement in lecture presentation are thus essential.

My development of lectures for this course now centers on the Tablet PC format. For a typical lecture, I now project Powerpoint slides with images or graphics only, and in class write down all the words that would otherwise have been previously pre-packaged. This allows for flexibility in choice of words, ability to emphasize some points over others, and also gives students time to take notes. Points seem to sink in better when written in class as opposed to merely projected. I also find that use of the Tablet PC works particularly well for the content of my lectures. Some points I emphasize with my lectures is that science is done by people, that scientific knowledge is fluid and open to interpretation, and that science doesn't have to be intimidating and difficult to understand. Use of the Tablet helps illustrate that science class is not about me revealing information that would otherwise be hard to access, but rather about topics open to discussion, revision, and student contributions, which I can summarize on-screen. Students really appreciate having their ideas heard, discussed, and written down, especially in science classes where they expect a less interactive experience.

**Delivery:**

Use of Tablet PCs is certainly enhancing the learning environment within the Biol 105 classroom, not just for me but also for my fellow Biol 105 instructors. I will be using these laptops in every course I teach for the foreseeable future. Tablet PC lectures can also be recorded using "Presenter" software and distributed to students for further study. I have decided against using this feature, for the time being, in order to encourage students to attend lecture. Online availability of course lectures may discourage students from attending lectures in person. Efforts to make the classroom experience more dynamic, such as through use of Tablet PCs, can indeed help reverse this tendency. Short-term loans and demonstrations of Tablet PC use to my Biology department colleagues is helping to disseminate information about the benefits and uses of the technology.