
Laptops in Humanities, Engineering, Science, and Mathematics

William F. Moss
March, 2003

Western Civilization -- Professor Burns

I currently teach Western Civilization on the laptop. Every day when students come to class they click on the day's link (there is a page prepared for each meeting) and we go through the links together. See syllabus at <http://people.clemson.edu/~burnsj/172syl2.html>

The laptop allows students to examine and discuss primary source materials together. As a historian, my job is to teach them to be historians--to learn to evaluate evidence from the past, and to construct arguments based on their interpretations. The laptop allows us to consider primary source materials--texts, but also art, architecture, music, film, etc.--in class. Without the laptop, I would be faced with handing out papers, showing slides, playing cds, setting up video, unfolding maps--and the students would not have the opportunity to jump easily from source to source to make comparisons.

History, Technology, and Society -- Professor Mack

I have taught small (25-35 student) laptop sections of History 122 (History, Technology and Society) for three years now. I make extensive use of the smart classroom, of making material available to students on web pages, and of the WebCT discussion board. I do in-class exercises that require the laptops about once a week, mostly having students look for information on the web and then report on what they find. This is particularly useful for exploring the range of attitudes towards a topic, and I also use it to teach students to search the web and evaluate information more critically. Students do usually have their laptops open during class; ideally they are taking notes to supplement the web pages I post and exploring the links I provide to learn more. In reality students using their laptops to do things unrelated to class is a big problem. I give open book tests so most students write their in-class essay tests on their laptops, which saves me from having to read their handwriting.

I have also been teaching a large section (about 90 students) of History 122, using a smart classroom but not laptops. Next fall, instead of the separate laptop section, that large section will require laptops. I will have a graduate assistant, who will sit in the back which I hope will help control student use of laptops. I will need to develop different kinds

of exercises using the laptops that are less dependent on class discussion.

Freshman Chemistry second semester -- Professor Eubanks

I am running CH 102 300 as a paperless course. Their homework is all on CD-ROM, and they answer questions about it in WebCT. Their weekly quizzes are also delivered via WebCT. They have in-class group activities, and they describe their outcomes/conclusions in text format entered into WebCT. Major exams are also delivered via WebCT. I consider the paperless class to be a success, and I plan to continue teaching chemistry this way. My main objectives will continue to be (1) to find better interactive instructional materials and (2) to find more efficient ways to create the questions databases.

Freshman English composition -- Professor Kanet

Here are my pros for laptop learning. Learners:

- Participate actively in learning
- Learn in a classroom transformed into a computer lab
- Have immediate access to tools of technology
- Gain technology skills essential for academics and business
- Become multi-media communicators

Laptop classroom activities include:

- Collaborative writing
- Online research and immediate use of appropriate examples
 - Evaluation of online sources
 - Electronic peer review
 - Web pages
 - PowerPoint presentations
 - Online publication of work
 - Integration of visuals with writing
 - Electronic portfolios (ultimate tool for job placement)

MBA Program -- Professor Blair

Like many MBA programs across the country, we will begin requiring all of the students entering our full-time MBA program to have a laptop computer beginning this fall. Our faculty in several areas, including statistics, management science, accounting, finance, operations management, and management information systems will indeed require the students to routinely use the laptops in class in a variety of uses. In addition, we feel that having immediate access to a computer and wireless network during the day between classes in addition to the in-class usage will allow students to be much more effective in their studies, particularly since we heavily emphasize the use of teams in our program.

General Freshman Engineering -- Professor Ohland

Throughout ENGR 101, there has been a significant amount of computer use. Students review departmental Web sites to familiarize themselves with the various disciplines, complete short quizzes implemented in WebCT, and respond to surveys.

In ENGR 120, computer use is well-integrated. Students create and interpret graphical representations of physical phenomena. A grant from the NSF (~\$500K) is being used to purchase real-time sensors, design laboratories to use them, and test their effectiveness compared to a number of other educational approaches. Students also use Excel for spreadsheet applications including graphing, data analysis, and fitting an equation to data.

Freshman Introduction to Computing -- Professor Sherrod

Laptops provide the students the opportunity to actually practice what I could in the past only demonstrate to the class. For example, today I will demonstrate building a tiny Access database. The students will build it along with me - and perhaps better see the relationships between the data - even have an opportunity to experiment and learn on their own. Laptops also provide me with some instant feedback in the way of quizzes/surveys to see how well a point was understood.

Freshman English Composition -- Professor Weaver

My students having laptops changed my entire approach to teaching. I am no longer my students only audience because they post their work on the Web and deliver presentations in the on- and off-campus community. I am no longer my students only source in the classroom because they have nearly unlimited sources available to them on the Web. When questions arise, they immediately research the issues

and report back to the class. I have more contact with my students and they have more contact with one another because we no longer have to wait until class time to work together. Collaborative projects are a mainstay of my courses now. I lecture less, mentor more, and learn more. My students teach more, collaborate more, and learn more.

Sophomore Calculus III and Differential Equations -- Professor Moss

The laptop is a perfect fit for these two courses. Calculus III is the first contact most students have with the mathematical description of the 3D world -- space curves, solids, and surfaces. The visualization possible via the laptop and software like Maple, have completely transformed this course. Differential equations courses that limit themselves to hand computations cannot consider complex engineering examples.

Both of these courses are taught in reduced-lecture, studio mode. The first 10-15 minutes of class is devoted to class business and a mini-lecture on the current topic. During the remainder of the class period, students solve problems in their course journal or in a Maple tutorial worksheet, and I roam around the room watching the students work and coaching students who are having difficulty. The Maple tutorials contain the following components: instructional objectives and suggested problems for each objective, a synopsis of the main ideas with examples worked by hand and with Maple, a list of problems to be done by hand in the student's course journal, and a set of problems to be done with Maple. Each student submits three to four tutorials per week electronically along with a selection of journal problems. These are graded by a teaching assistant. The hour exams and final exam are hybrid. About half the problems must be done by hand showing all work and the remainder are done with Maple and submitted electronically. Outside of class students work in teams of three on more advanced engineering problems. My favorite project for Calculus III involves the placement of cell phone towers, and my favorite project in differential equations involves modeling the trajectory of a curveball.