

SUMMARY CONCLUSIONS FROM ASSESSMENT FINDINGS

Summary Conclusions on Objective 1: To evaluate the impact of teaching with wireless technology in a collaborative setting on student performance, specifically in the areas of writing and problem solving.

- Overall, the faculty teaching the courses GC120, CSC 116, and MA141/241 have used the laptop program to incorporate the lab section of the course into the lecture portion. They have increased the visualization of the course content through use of the laptop during the classtime. They have integrated lecture with hands-on experience. Therefore, the use of the laptop has changed the pedagogy of how the faculty have traditionally taught these courses. The honor students who were the initial participants in this program were able to show improvement in their skills compared to other (matched) students.
- In GC120, several dimensions of problem solving using graphics and computer-aided drawing were enhanced by the use of the laptop in class every day. The laptop section students had more ability at the preciseness of geometry and dimensioning of the model in GC120. The lack of daily access of computers in the regular section of GC120 may have led to more emphasis on sketching in the regular section than the laptop section. The regular section students had more ability at paper sketches and visualization of the models than the students in the laptop section.
- The students were honor students in the CSC 116 laptop sections. They could write better programs than those in a regular section of the course. The laptop honors sections could better interpret the question, write code structurally correct, follow the OO Paradigm and were ready for advancement into the next programming course. The honor students performed better in the laptop section than compared to similar students who were taught in a large lecture by the same instructor.
- The section of students who identified themselves as “afraid of computers and programming” also a special section of CSC 116 with the laptops. The fearful group that used a laptop did not perform as well as those students with comparable SATs that took the course in a large lecture hall with the same instructor. HOWEVER, the fearful group did pass the course at a higher rate than the average pass rate of all sections. That is, more of the fearful students passed the course than would have been expected without the laptop section.
- § Use of Maple within the calculus sequence of courses seemed to help students improve their visualization of mathematical concepts. This was shown with direct evidence in one section of a calculus course, and can be seen in students and faculty written comments and survey questions throughout the four years. The faculty also commented that use of MAPLE in class allowed students time to solve more complex word problems and increased student understanding of why MAPLE was important to learn.
- It seems clear that what students are learning in the laptop sections may be different in some way – more depth, more visual.

- § Survey results suggest that the laptop students use the computer more than non-laptop students for education related activities, except for contacting their instructor. Most of the students did not feel that the laptop in class was a distraction. Use of the computer made learning more enjoyable and more stimulating for the students in the laptop group compared to the regular students
- In the essays written by students, most of the students reported a benefit of the laptop was having access to their files at all times, so that they could work on their projects and course work at any time, at any place, and quickly share files with others (during and after class periods). The laptop allowed them “freedom” and “independence”.
 - Comparing faculty responses to student responses on surveys showed that approximately the same percentage of students and faculty (77-79%) agreed that the laptops in class enhance learning.. A higher percentage of students (85%-90%) than faculty (62%-79%) felt that the laptop makes learning more enjoyable and stimulating. The students agree that the technology improves communication between instructor and students, while most faculty did not agree that it helped improve communication. (This result is in line with the book: *Educating the Net Generation*, published by EDUCAUSE.)
 - In open-ended responses to survey questions, faculty discussed that the laptop computer in class helped increase the pace and variety of the material by having access to the Internet, solving more complex and challenging problems during class, and using peer learning during class. The pace may be slowed by technical difficulties or by students spending time on complex problems.
 - Because HOW to use the technology during the course was very important, not just having the technology, the Pilot Program increased emphasis on pedagogy during fall 2003-spring 2005. Efforts were made to work with faculty to improve their courses with technology through seminars, summer training sessions, faculty forums, and direct consultation during these two years.