

HP Technology for Teaching Initiative Fact Sheet

Title: 21st Century Mobile Classroom Project

Project Abstract:

In July of 2004, Springfield Technical Community College received a grant from Hewlett Packard to implement mobile technology in the classroom. Using HP Tablet PCs and electronic ink, students produce handwritten mathematical homework solutions to complex problems. These solutions are delivered to the instructor electronically; the instructor grades the solutions using electronic ink and sends them back to the students electronically. This process eliminates paper and gives students rapid feedback compared to the traditional method of collecting paper one class, grading and passing back paper the next. The STCC professors involved in this project represent the Schools of Engineering Technology, Math, Sciences & Engineering Transfer. During the project, they serve as mentors to other faculty preparing to adapt their curriculum for use in a mobile technology driven classroom.

Rationale:

Community college students typically work full time and do homework during off hours and on the weekends. Community Colleges also typically do not have dormitories and students live at home or in off-campus housing. The Tablet PC in combination with a delivery system like Blackboard and email has allowed students access to course materials, other students and instructors during these times. Consider a traditional class that meets Tuesdays and Thursdays with students given a homework assignment on Thursday due the following Tuesday. The student goes home on Thursday and has no contact with the instructor until the following Tuesday when the assignment is due. If there are problems, the student has no alternative but to struggle to find a solution. Now consider the same scenario with the student and instructor utilizing Tablet PC's. The student starts working on problems immediately using Word and Ink. Interim handwritten solutions are delivered to the instructor electronically and the instructor replies back rapidly. The potential to provide feedback with partial solutions and instructor aid through a solution process in a four-day period is immense and points to the limitations inherent in the traditional classroom environment.

Each course utilizing the Tablet PC's is mathematically intensive and includes a hands-on three-hour laboratory each week. In these courses, students have enthusiastically been taking notes using Microsoft OneNote and electronically submitting homework, quizzes and exams using the Ink feature in Microsoft Word 2003. End of course surveys completed over the past four semesters indicate students used the Tablet PC's extensively in all courses they were enrolled in and believed the Tablet PC helped them considerably when taking notes and communicating with instructors and other students.

Implementation (pedagogy):

Using the Tablet PC and electronic ink, students produce handwritten mathematical solutions to complex problem assignments. These solutions are delivered to the instructor electronically; the instructor grades the solutions using electronic ink and sends them back to the students electronically. This process eliminates paper and gives students rapid feedback compared to the traditional method of collecting paper one class, grading and passing back paper the next. The professors involved in this project represent the Schools of Engineering Technology, Math, Sciences & Engineering Transfer. During the project, they serve as mentors to other faculty preparing to adapt their curriculum for use in a mobile technology driven classroom.

Implementation (technology):

The fundamental problem with any math-based course delivered in a distance or hybrid-distance format is homework, quiz and exam submission. Students and faculty find using Microsoft Word's Equation Editor tedious and time consuming. Students hand write a solution on paper and then take a considerable amount of time keying that solution into Word using Equation Editor. Time that could be used for learning is wasted on word processing. Using the Tablet PC and Word 2003 students hand write solutions and send them electronically to the instructor. The

instructor then opens the file in Word and hand grades the submissions electronically. When grading is complete the instructor sends the work back to the student. This method is especially effective because, in electronic format, documents can be transmitted rapidly between student and instructor.

Impact on Teaching:

Project Goals include:

- Enhance learning and success in mathematically intensive courses using mobile technology.
- Drive education in the science, technology, engineering and mathematics (STEM) fields through the development and maintenance of state-of-the-art methods and materials.
- Leverage mobile technologies to create an instructional system that maximizes relevance, timeliness and efficiency in curriculum and materials distribution and feedback.
- Promote awareness of new technologies utilizing a series of established national networks.
- Institutionalize work done to promote sustainability and commitment.

Goals and objectives have been met with interesting results. See www.nctt.org/hp for many samples of student and professor work.

Impact on Student Learning:

Over the period of the grant we have attempted to quantify improvements to teaching and learning through a comparative study of classes using the Tablet PC's versus similar classes without benefit of Tablet technology. This evaluation process has included both formative and summative activities with students surveyed over the course of and at the end of each semester. In all cases, students have been extremely satisfied (approximate average 9.7 on a scale of 10) with the TabletPC and believe the Tablets have enhanced their ability to learn and communicate with instructors.

Quick Facts:

The following Tablet PC faculty have used Tablet PC's with their students as part of the grant:

Professor Jim Downing [jdowning@stcc.edu]: Lightwave Communications (Fall 2004 – 18 students)

Professor Gordon F. Snyder Jr [gsnyder@stcc.edu]: Fundamentals of Telecommunications (Fall 2004 – 18 students)

Professor Diane D. Snyder [dsnyder@stcc.edu]: Digital Electronics (Spring 2005 and Spring 2006 – 36 students)

Professor Jean-Marie Magnier [jmmagnier@stcc.edu]: Calculus I (Fall 2005 – 18 students)

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References:

HP Technology for Teaching Grant Initiative:

http://www.hp.com/hpinfo/grants/us/programs/tech_teaching/index.html