Student Owned Computing Program / Laptop Program

Kathy Mayberry, Rebecca Brent & Dianne Raubenheimer
Overview

Dianne Raubenheimer
Purpose

- To inform the COE executive committee of the current status of the student owned computing program
- To present some assessment data regarding student and faculty use
- To present information about the laptop support program
- To describe current assessment processes
- To elicit discussion about future directions
Basic Premise

- Within the College of Engineering there was general agreement that the use of laptops and computers would enhance student learning.

- This led to the development of the student owned computing program …
Goals
(Dean’s Retreat Fall 2003)

- Encourage students to purchase laptops
- Develop infrastructure to support technology in classrooms
- Provide faculty training in the use of technology and laptops
- Each department to identify courses in which to use laptops
Goals

(Computer Committee April 2004)

- By 2006, the college will expect (but not require) all incoming undergraduate students to have a laptop that meets college specifications.
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Student Learning

- **Enhanced Problem Solving** - GC120, CSC 116, and MA141/241 used the laptop program to integrate lab and lecture sections of the course.

- Assessment results show that student had **significant gains** over non-laptop sections in regard to:
  - the **visualization** of the course content,
  - several dimensions of **problem solving**,
  - **graphics** and **computer-aided drawing**,
  - **programming** was improved in several sections.
Student Attitudes

- 85% felt laptops make learning more enjoyable
- 84% felt in-class use of instructional technology stimulated learning
- 84% indicated the E115 experience increased comfort in using their laptop
- 99% prefer working on their own computer instead of in a computer lab
- 96% say laptop gave them freedom to work any place, any time
Faculty Attitudes

- Over the four year period, 57% said **pace** had increased; 43% said **variety** increased and 61% said course **depth** increased.

- 66% of the faculty agreed that students were more **involved in learning** in their laptop course.

- 20 out of 32 (62%) faculty said **preparation time** for the laptop section was increased because of modifications in pedagogy.
Student Owned Computing

Kathy Mayberry
Computer Ownership Among Incoming Freshmen

- Percentage of students bringing computers
- Percentage of students bringing laptops
Timing of Laptop Purchase Among Incoming Freshmen

- June 2005 or later; 76%
- Unspecified/Unsure; 5%
- Freshman Year of HS or Earlier; 1%
- During Sophomore Year of HS; 1%
- During Junior Year of HS; 5%
- During Senior Year of HS; 12%
Method of Acquiring Computer

- Purchased with my own money; 28%
- Received brand new from parents; 47%
- Received via a grant or scholarship; 4%
- Received a loan to purchase the computer; 3%
- Received Used from family member or friend; 5%
- Received New from family member or friend; 5%
- Received; unspecified; 1%
- Other; 7%
Alleviating Concerns

- **Hardware**
  - See graphs

- **Software**
  - MS Office Select for students
  - VCL
  - Licensing for student owned computers

- **Support for students**
  - Empower students – E115
  - Vendor support – Warranty and Damage Protection
  - ITECS Help Desk

- **High need students**
Plans for Fall 2006

- Informational brochure mailed to incoming students
  - The College of Engineering expects all incoming freshmen to have a laptop.
- Students will “opt out” of laptop sections of E101 and E115
Future Teaching “Labs”

- How many fixed desktops?
- Virtual Computing Lab (VCL)?
- Data and power wired to the seat?
- When is wireless sufficient?
Assessment of Laptop Program

Dianne Raubenheimer
Evaluation of Pilot Program

The pilot laptop program was evaluated from 2001 – 2005.

The evaluation focused on 7 program objectives, including (a) the impact of teaching with wireless technology on student performance, and (b) the impact of teaching with wireless technology on faculty workload, pedagogy and amount of material delivered.

The detailed report By Dr Joni Spurlin can be found at ... http://www.eos.ncsu.edu/soc/assessment/
Selected Results

Selected results in three categories will be presented:

- Impact on student learning
- Student attitudes
- Faculty perceptions
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Laptop Program Support
Spring 2005

Rebecca Brent
Activities Spring 2005

- January: Individual interviews and consulting sessions with 8 faculty participants
- January 31: Opening meeting
  - Participants shared plans for semester
  - Distributed material on active learning and classroom management strategies
February-April:
  - Consulting meetings with individual faculty
  - Classroom observations and feedback

May 4: Final meeting
  - Four faculty participants formally presented their projects
  - Jeff Joines presented material on Silicon Chalk

May 12: Workshop by Dr. David Clough, University of Colorado

*Integrating Spreadsheet Problem Solving into Teaching in Engineering and Science*
Sample Projects

- Teaching Excel with Visual Basic stressing problem-solving algorithms
- Developing software proficiency test
- Developing spreadsheet simulation of wastewater treatment plant
- Using short computer activities in nearly every class to reinforce lecture material
Affective Benefits of Laptop Use

![Bar chart showing the percentage of students who find laptop use more enjoyable or more stimulating. N=220.]
Benefits Outweighed the Difficulties

Instructors

Percentage of students
Activities Spring 2006

- Working with
  - Faculty member in CBE using laptops in a large class—pilot testing MatLab installation on student computers
  - Assessment of new course with emphasis on Excel and VBA
  - Revision of E115 for student-owned computers, more hands-on activities, and more effective TA preparation
What We Are Learning

- Effective use of laptops or classroom computers takes time to learn
- Faculty need help with classroom management strategies (particularly off-task behavior)
- Renewed enthusiasm for teaching
- Faculty support (from experienced peers, pedagogical consultants, graduate students) is vital for genuine course transformation
To promote effective in-class computer use in the COE:

- Provide **systemic support** for Teaching consultant, peer coaching, faculty interest groups & forums, student assistants

- Offer **ongoing faculty development** for pedagogical aspects of computer use

- **Assess** the impact of new pedagogies on student learning
Spin-offs

- Faculty are increasing their use of laptops in subsequent courses.
- Redesign of individual courses and sequences of courses is beginning.
- Faculty are making presentations to peers and at conferences about their work.
- Impacting laptop use in other colleges.
- Cost-effectiveness of faculty development project.
Assessing Student Learning Outcomes

Dianne Raubenheimer
Assessing Student Learning

- From the initial assessment and faculty development processes, we learned that assessing the impact of technology on student learning needed to wait until faculty had further developed their courses and integrating the technology.

- First needed to assist faculty with **HOW** to use technology and modify their pedagogy.

- So, assessment of student learning was resumed Spring 2006.
Spring 2006: Assessing Student Learning

- Developed assessment plans with faculty from the Spring 2005 laptop support program.

- Purpose is to identify and assess specific student learning outcomes taught with the use of laptops.

- Four courses being assessed
  - CSC 116 (6 sections)
  - CE 325
  - BAE 495
  - CHE 205

- Mixed method research designs being used.

- Results will be analyzed this summer.
Quo Vadis?

Dianne Raubenheimer
Returning to the 2003 Goals

- Encourage students to purchase laptops - **Satisfactory Progress**
- Develop infrastructure to support technology in classrooms - **Satisfactory Progress**
- Provide faculty training in the use of technology and laptops - **Some Progress**
- Each department to identify courses in which to use laptops – **Little Progress**
The Questions to You

- How can **faculty be motivated** and systematically **supported** in using laptops and other forms of technology in class?
- How can effective pedagogical approaches and student learning **results** be most effectively **disseminated** to other faculty?
- How can **developments at the departmental level** be initiated, supported and sustained?
- How can **people and resources be mobilized** to support these initiatives?
- Are there **other new goals** needed for the program?
Discussion

Question 1 - How can faculty be motivated and systematically supported in using laptops and other forms of technology in class?
Discussion

n **Question 2** - How can effective pedagogical approaches and student learning results be most effectively disseminated to other faculty?
Discussion

- **Question 3** - How can developments at the departmental level be initiated, supported and sustained?
Discussion

- **Question 4** - How can people and resources be mobilized to support these initiatives?
Question 5 - Are there other new goals needed for the program?