

To: College and General Faculty Members
From: Judith Weckman
Date: April 19, 2002
Re: Results of Universal Access Assessment Project

Introduction

Enhanced access to information is often a critical part of learning. Because of this, Berea College has chosen to greatly expand the availability of computer technology. With the primary goal of deepening and broadening learning experiences, the college will provide all students and teaching faculty with a personal laptop computer in the 2002-2003 academic year.

In order to prepare for this, Berea College has been steadily moving toward creating a universal access environment by installing computer network connections in classrooms, the library, and residence halls. The initial phase of this "Universal Access Project" has been to increase the speed of the network 200-fold since 1998. Also, since the mid-1990s, a total of 80 campus buildings have been attached to the network including 26 student residences and 24 academic classroom buildings. Across the entire campus, the number of network ports is now 3,573. Currently, 21 Information Systems and Services (IS & S) full-time staff members provide support to students, faculty, and staff through consultation, education and training, customized programming, and troubleshooting.

Beginning in Spring Term 2001, laptop computers were issued to students in a small number of selected courses. In Fall Term 2001, about 400 students received a laptop computer as part of their enrollment in specific courses. This "pilot" phase of the Universal Access Project, nicknamed EDGE (Empowering a Dynamic Generation Through Education), was intended to work out technical difficulties and to evaluate the impact of having laptop computers in the classroom. Nineteen participating faculty members wrote proposals for courses to be included in the "pilot program." Each faculty member also committed to assessing the impact of the program upon students.

Creating an Assessment Plan for the Universal Access Project: A Collaborative Process

In September 2001 the Provost, Dave Porter, asked the Director of Information Systems and Services, Martin Ramsay, to assemble a team to organize the assessment effort. The team (including Anne Chase, Jennifer Mills, and myself) began its work by reviewing the original grant materials that were used to fund the initial laptop purchases. These documents articulated the goals of the Universal Access Project.

Using the goals set forth in these documents, the team set up two luncheons and invited all participating EDGE faculty (19 faculty representing 11 disciplines) to join in a discussion about how to construct an assessment plan. See **Appendix A** for a list of participating faculty and courses. After a discussion about the need for evaluation, faculty members were asked to put in writing what each of the goals listed below meant *within the context of the course he/she taught*. The faculty members were also asked to suggest how each might be assessed giving examples of what they believed would be meaningful evidence.

The primary goals of the project included:

1. “To create a greater community of learning among students and faculty”
2. “To foster more active, more interactive, better-integrated, more customized, and yet more collaborative learning.”

Other goals of the project (as articulated by the funding documents) included increasing the occurrence of “data collection and learning in the field, work-study situations, internships and on the job.”

In a group discussion that followed, faculty members then shared how they had responded to each of the questions. Planning for the assessment continued after the luncheons and by November the group (project team leaders and participating faculty) had devised and agreed upon the following four-part assessment plan:

- a common survey to be given to all students near the end of the term designed to assess students’ perceptions of the benefits and problems associated with the laptops, the time spent using it, and alternate uses outside of class
- specific items or questions added by individual faculty members to the common instrument (items specific to individual courses)
- any other evidence or data that faculty members collected (e.g., test score comparisons with similar or past courses, observations of behavioral changes, changes in thinking, understanding, etc.); faculty members were encouraged to construct these types of assessments and advised/supported through consulting
- feedback from participating faculty (collected after the course was over); the following five questions were answered by each faculty member:
 - 1) *What benefit (or drawback) for you and for the students was the laptop in the course you taught?*
 - 2) *Was your approach to teaching this class changed or modified because all the students had laptop computers? If so, how? If not, why?*
 - 3) *Did it enhance their learning either in depth or breadth?*
 - 4) *Any other observations?*
 - 5) *Would you teach another course using the laptop, why or why not?*

Student Survey Results:

Of the 305 students who responded to the laptop assessment project survey, most (67%) indicated they were taking the class for their major. Nearly 32% were freshmen, 21% sophomores, 20% juniors, and 25% seniors (3% were special students).

Respondents indicated that in a typical week, the number of hours spent using the laptop for course work was on average 10.7 hours (mean); the most common response was 10 hours. The average amount of time reported for *other* uses was 4.3 hours but the most common response was zero.

The survey included nine open-ended questions and four structured items. The structured items used a 6-point scale where 6 was “completely agree” and 1 was “completely disagree.”

Each of the four items was rated positively (above 4 on the 6-point scale). Following are the results for each item:

- *The laptops are helping students to learn the material in the class.* The mean rating was 5.08 (out of 6); 84% of the students rated this item either a 4, 5, or 6 and 47% rated it a 6 (completely agree).
- *The laptops are helping students work together in this class to learn the materials.* The mean rating was 4.74; 78% of the students rated this item either 4, 5, or 6 and 37% of the students rated it a 6 (completely agree).
- *Students are helping each other with technical problems associated with the laptop.* The mean rating was 4.86; 82% of the students rated this item either 4, 5, or 6 and 38% rated it a 6 (completely agree).
- *The laptop is being used effectively by the instructor to help students.* This was the highest rated item with a mean of 5.33; 90% of the students rated this item either a 4, 5, or 6 and 56% rated it a 6 (completely agree).

Refer to the chart on the next page for a summary of the results given above and see **Appendix B** for a copy of the student survey instrument.

Open-ended questions on the student survey are listed below with a summary of student responses.

What benefit, if any, has the laptop been for you in this course?

Almost every respondent cited some benefit with having the laptop. Students cited most often that the laptop saved them time; it was convenient for doing assignments in their rooms, using the Internet, working on presentations, and communicating with instructors.

What technical problems, if any, have you encountered with the laptop?

The most common response was that there were only minor or no real technical problems. Others cited mouse, mousepad, or joystick difficulties, lock-up or freezing problems, slow Internet connections, signing-in difficulties, and booting up and general password problems.

What suggestions do you have for improving the orientation process for using the laptop?

The most common response was “no suggestions.” Others cited a variety of suggestions including providing more help with installing campus printers and hooking up devices in order to use Powerpoint, sharing more information on installed features, using a demonstration rather than a video in the orientation, and following up with more sessions and printed materials.

Student Survey Results Laptop Assessment Project All Courses – Fall 2001

Structured Item Results:

Student Classification:

Freshman	96
Sophomore	64
Junior	61
Senior	76
Special	8
TOTAL	<u>305</u>

Reason for Taking this Class:

For Major	203
For Minor	20
For an Elective	29
For a required GST	37
For basic Math	16
TOTAL	<u>305</u>

In a typical week, how many hours do you use your laptop for course work?

Range:	0 to 140
Mean:	10.7
Median:	9.0
Mode:	10.0

In a typical week, how many hours, if any, do you use a computer lab for any purpose?

Range:	0 to 100
Mean:	4.3
Median:	1.0
Mode:	0.0

Rate each statement below in terms of how much you agree with each:

	Completely Agree					Completely Disagree								
	6	5	4	3	2	1	Missing		Mean	Median				
The laptops are helping students to <u>learn</u> the material in the class	144 (47%)	65 (21%)	48 (16%)	31 (10%)	2 (1%)	1 (<1%)	14 (5%)		5.08	5.00				
The laptops are helping students to work <u>together</u> in this class to learn the materials.	112 (37%)	67 (22%)	58 (19%)	41 (13%)	7 (2%)	7 (2%)	13 (4%)		4.74	5.00				
Students are helping each other with technical problems associated with the laptop.	115 (38%)	83 (27%)	52 (17%)	28 (9%)	11 (4%)	4 (1%)	12 (4%)		4.86	5.00				
The laptop is being used effectively by the instructor to help students.	171 (56%)	79 (26%)	23 (8%)	13 (4%)	2 (1%)	5 (2%)	12 (4%)		5.33	6.0				

Give an example of an assignment or activity that used the laptop in your course. Was this better than using a computer lab? If so, why? If not, why?

Respondents mentioned a variety of assignments including requiring the use of Internet sites for research, WebCT assignments, Powerpoint presentation preparation, and statistical analyses using SPSS. Other examples included editing papers, using Excel spreadsheets for setting up accounting problems, using Autocad for constructing drawings, taking a long take-home exam, studying for exams, creating posters, and creating a brochure for the public as part of an applied nursing assignment.

In what ways do you use the laptop outside of this course?

Using e-mail was the most common response. Others included doing research and typing papers for other classes, preparing graduate school applications, general Internet surfing, listening to music, shopping on-line, using the laptop for labor assignments (placing orders, communicating with labor groups, etc.), searching for internships, playing games, and visiting chat rooms.

Do you find yourself using computer resources more frequently since you have access to the laptop? Please explain.

The overwhelming majority reported “yes.” Students explain that it is simply more convenient to use their laptops and avoid going out at night to a possibly crowded public computer room. They cited the laptop’s portability and easy access at any time.

What, if anything, do you use computers in public labs for?

“Nothing” was the most common response but many students cited using the public computer labs for printing or special purposes like the use of graphic arts software.

Feedback from Participating Faculty

The following five questions were asked of faculty after the conclusion of their courses. Their responses are summarized below.

- *What benefit (or drawback) for you and for the students was the laptop in the course you taught?*

Most faculty cited a wide range of benefits including fostering better communication with students, building a better community of learners among the students, and facilitating more active, collaborative, and customized learning. Faculty also mentioned reaping the benefits of using Powerpoint, taking advantage of the Internet to be better informed, completing assignments in shorter time periods and without as much assistance, making good use of various software packages, and being able to expand assignments in general.

Three faculty members cited negatives. One mentioned long boot-up times, another said there was no real benefit in his particular class, and the other expressed a concern that students could retreat behind the screen during class periods.

- *Was your approach to teaching this class changed or modified because all the students had laptop computers? If so, how? If not, why?*

Most faculty responded that their approach to teaching changed somewhat. Examples included making the learning environment more like a real work setting, letting the teacher focus more on the students' needs in class, and allowing the teacher the ability to make more coherent presentations in class. Other examples given included creating new kinds of assignments, intensifying the workshop style of the class, and enhancing communication in general. A few faculty expressed that their approaches changed very little because the laptops were used only for very specific purposes (i.e., for certain software applications, etc.)

- *Did it enhance their learning either in depth or breadth?*

Five faculty members expressed doubt or were not sure that student learning was enhanced. The majority responded positively by citing that learning had expanded in both depth and breadth, new skills were acquired, more material in general was absorbed, higher pass rates on standardized tests were realized, students wrote better papers and learned to communicate better, and students seemed more motivated.

- *Any other observations?*

Positive comments included statements about how the learning was enhanced by cooperation among students (technical problems actually promoted early classroom interactions) and how the laptops made the relationship with the teacher a closer one. Other positive comments included compliments on the overall support system and the benefits of students using the laptops for writing (making editing and re-drafting more convenient) and presentations.

Negative comments made by participating faculty included complaints about students losing a sense of "community" by not being in a public computer lab, experiencing difficulty with accessing the network, and losing time in class dealing with starting-up computers. Other problems cited included the mental and physical burden of students keeping up with their laptop computers (hauling them around) and the issue of how distracting the Internet can be (surfing the Internet for entertainment purposes).

- *Would you teach another course using the laptop, why or why not?*

The overwhelming majority of respondents said yes. Reasons given included the increased flexibility, enhanced communication between students and teacher, the promotion of more active and customized learning, and the convenience for writing, editing, and research assignments.

Individual Course Assessments Designed by Participating Faculty

Four faculty members designed course-specific assessments for their laptop courses. One faculty member designed an assessment plan that examined educational outcomes of students who used the laptop versus those in the same course (different section) without laptops. The other assessments involved the use of questionnaires aimed at student satisfaction and the perception of learning. See **Appendix C** for descriptions of the assessments and results used in these courses.

Summary

Students and faculty indicated that there were many benefits associated with having laptop computers. The benefits had to do with convenience, enhanced communication, and in several cases, the broadening and deepening of learning or skill development. Most faculty believed that the personal laptop computers enhanced students' ability to learn the course material and work more collaboratively. Most students agreed that faculty were using the laptops effectively to help students learn. Although some frustrations were expressed with technical and practical problems, students and faculty were able to work through most of these difficulties.

APPENDIX A

Universal Access Pilot Project (Participating Faculty and Courses)

ANR 106—Mike Panciera
BIO 486—Ron Rosen
BIO 492—Megan Hoffman
BUS 120B—Trish Isaacs
BUS 120A—Trish Isaacs
BUS 125—Dan Vazzana
CFS 145—Lowell Taylor
CFS 480—Ros Cox
CSC 320—J. P. Lee
ENG 202—Libby Jones
GSTR 100—Richard Sears
GSTR 100—Janey Wilson
GSTR 355—Peggy Rivage-Seul
MATH 010-012—Nicki Rosen
MATH 309—Lynn Wu (Short Term 2002 course)
NUR 343—Elaine Roberts
PED 247—Martha Beagle
PSY 305—Gene Chao
TEC 130—Alan Mills
TEC 265—James Yount

APPENDIX B

Student Survey

Laptop Assessment Project (Fall Term 2001)

Course _____ Name _____
Student Classification _____ Gender _____

Reason for taking class (circle one):

for major for minor for an elective for a required GST for Basic Math

What benefit, if any, has the laptop been for you in this course?

What technical problems, if any, have you encountered with the laptop?

What suggestions do you have for improving the orientation process for using the laptop?

Give an example of an assignment or activity that used the laptop in your course. Was this better than using a computer lab? If so, why? If not, why?

In what ways do you use the laptop outside of this course?

In a typical week, how many hours do you use your laptop for course work? _____

Do you find yourself using computer resources more frequently since you have access to a laptop? Please explain.

What, if anything, do you use computers in public labs for?

In a typical week, how many hours, if any, do you use a computer lab for any purpose? _____

Rate each statement below in terms of how much you agree with each:

Completely
Agree

Completely
Disagree

6

5

4

3

2

1

Fill in a number for each statement using the scale above.

___ The laptops are helping students to *learn* the material in the class.

___ The laptops are helping students to work *together* in this class to learn the materials.

___ Students are helping each other with technical problems associated with the laptop.

___ The laptop is being used effectively by the instructor to help students.

APPENDIX C

Descriptions and Results of Individual Faculty/Course Assessments

Nicki Rosen (Basic Mathematics)

During the Fall Term of 2001, three sections of Basic Mathematics (MAT 010 and MAT 011) taught by the same instructor using *Interactive Mathematics*, were chosen to participate in the laptop project. One section (8:00A.M. class) was given laptops to use outside of class to work on the course. The other two sections (10:00 and 11:00 A.M. classes) had to do their homework in one of the computer labs on campus. The goal of the study was to see if having a personal laptop would impact hours spent online working on the course, attendance in class, and completion rates for the basic math courses in which students had enrolled. Also, since Berea College was moving toward Universal Access (laptops) for all students in the Fall of 2002, the Basic Math program wanted to use this opportunity to troubleshoot with a small group of students (13) potential problems that might arise when the whole program (120 students) have laptops. However, study results did *not* indicate improved performance, time spent, or completion rates for laptop students. The instructors speculated on various factors that may have contributed to these results including the 8:00 AM (versus classes later in the day) section being the laptop class.

Megan Hoffman (Biology)

For her Biology Seminar course, Dr. Hoffman compared a laptop class to a previous non-laptop class on their ratings of Microsoft Word's edit and review capabilities. She found that the laptop students were more likely to agree to statements such as "It is more convenient to provide feedback to the author on the computer than on a paper copy" and "It is easier to incorporate reviewers comments on the computer than when using paper copies." Laptop students were more likely to agree with "I will use some of the computer skills I've gained from this class when preparing papers or presentations." Evidently, the personal laptops facilitated the use of identical software used by both classes.

J. P. Lee (Mathematics)

Dr. Lee asked his students to review the goals of the laptop project (stated below) and comment on each.

- *To create a greater community of learning among students and faculty.*
- *To foster more active, more interactive, better-integrated, more customized, and yet more collaborative learning.*

These are the same goals that the faculty reviewed and gave their suggestions on how to assess. Dr. Lee also asked how the laptop helped or hindered learning and encouraged

students to compare their laptop experience in the course with their experience in a similar course taken in an earlier term.

Students commented on the convenience of having the laptop and how it enabled them to work along side the instructor on examples in class. One student expressed that his/her learning increased 10-fold because of the laptop. Another felt like the laptop did not help much but its portability was a plus. Others commented on the increased collaboration with other classmates and several expressed that it did make the learning more active and interactive. One student commented that he/she wasted a lot of time “surfing” the Internet because he/she had a personal laptop computer.

Trish Isaacs (Economics and Business)

Dr. Isaacs asked her BUS 120 (two sections) students to respond to three questions including:

- *What do you like most about having your own laptop this semester (laptop advantages)?*
- *What do you like least about having your own laptop this semester (laptop disadvantages)?*
- *Complete this: My most frustrating experience with my laptop has been...(laptop frustration)*

The most common advantages cited included general convenience, doing work wherever students wanted to rather than in a public computer lab, how helpful the laptop was in completing assignments, doing homework, and writing papers, and how helpful it was for doing research.

The most common disadvantages cited included complaints of how heavy the laptop was to carry around and how stressful it was to keep it safe from theft (or loss). One student complained that it wasn't fair to take the laptop away after one term.

Frustrations cited included problems with “freezing up,” mouse problems, difficulties with particular software applications such as Microsoft Excel, and having to guard the machine from loss.