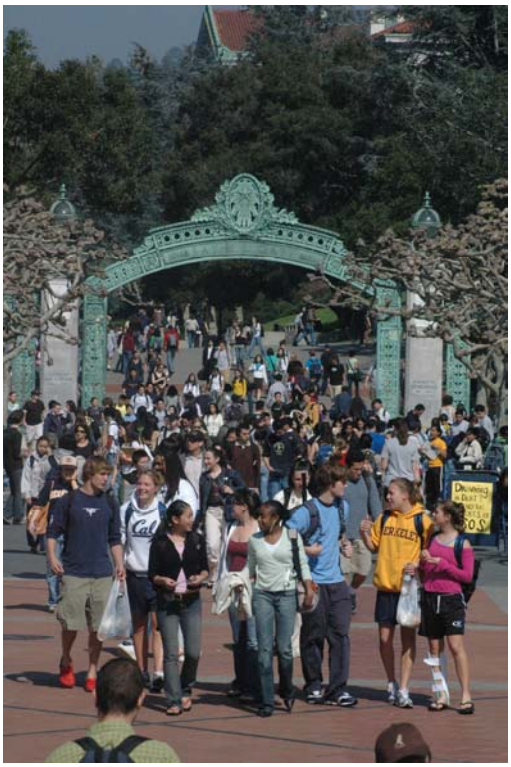
# Information Technology at UC Berkeley: The Student Experience

January 2007

*A Leadership Development Program 2006–2007 Team Project*

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# Executive Summary

Today's incoming students rely heavily on information technology (IT) in their daily lives. Whether referring to a course website, managing financial aid online, or instant messaging friends, students use IT as a tool to help them accomplish their goals more easily. Technology helps them learn, interact, and simply enjoy themselves. The ways students use technology are diverse and ever-changing.

As a provider of IT solutions, the university must continually respond to the changing expectations of our students. Given limited resources, solutions must be cost-effective and flexible. They must be designed with student needs in mind and with the recognition that those needs will continue to change.

Faced with this issue, Associate Vice Chancellors Susanna A. Castillo-Robson and Shelton Waggener have sponsored a study on the IT needs of today's incoming Berkeley students, conducted by eight Berkeley staff members participating in Berkeley's Leadership Development Program.

This report identifies the most prevalent trends and needs of students; identifies where on the continuum of satisfaction the university's current portfolio of technical solutions meets their needs; prioritizes which areas of technical enhancement the campus should be focusing on to achieve an environment that students will embrace and use to stay connected with the university from prospect to alumni; and recommends mechanisms to continue to gather student IT trends into future years.

*Project objectives*

- Evaluate the technology needs and expectations of incoming students.
- Provide recommendations for closing the gap between these expectations and what the university currently offers.
- Propose a method for ongoing campus-wide evaluation of student IT needs.

*Process*

- Obtain input directly from students about their IT experiences, preferences, and needs.
- Interview key campus technology providers about their perspective on student technology needs, including what they hear from students.
- Interview peer institutions recognized for their IT best practices.

*Key findings*

- Today's students live in an "anytime, anywhere" world, where access to information and communication is available 24/7/365.
- Not all students are technophiles or early adopters. Most will choose to use new technologies when people they know and associate with use them.
- Not all students have the same access to technology resources. Vulnerable groups include those who lack financial resources, commuters, first-generation college students, students with family responsibilities, students with disabilities, and international students.

- Graduate students differ from undergraduates in that they tend to have more experience with technology, are more mature, and rely more on their individual departments than on central campus services.
- Students say that the type and quality of technology offered by the campus is important.
- New students like some, but not all, of the technologies they have encountered at Berkeley.
- Any technology developed must be able to grow with student needs.

*Recommendations for shrinking the gap between student expectations and campus IT offerings*

- Focus on making IT available "anytime, anywhere." The most common request from students is for campus wireless access to be comprehensive. Similarly, students who use computing labs would like to see more of them and longer hours.
- Make communications with campus IT services dynamic. Consider online personal assistance, dynamic web-based queries, instant email responses, and a centralized helpdesk.
- Make the student experience of using multiple systems seamless. Expand the use of CalNet single log-in for all campus IT systems. Integrate course enrollment software with course management software to give students one-stop access for academics.
- Establish a collaborative design culture in which students help produce their IT environment.
- Choose, design, and develop systems that offer flexibility to accommodate upgrades and enhancements to meet rapidly changing student technology needs.

*Recommendations for continued assessment of student expectations*

- Use existing campus electronic surveys to gather information about trends in new student IT ownership and usage, IT expectations and satisfaction, and learning styles and preferences.
- Coordinate independently-run surveys with the calendars of the Office of Student Research and the Graduate Division.
- Integrate feedback options and customer satisfaction polling into administrative service websites.
- Partner with other Berkeley researchers across organizational and departmental boundaries to extract information from their research in progress, advocate for inclusion of IT-relevant questions in their future research, and collaborate on joint research.
- Use classroom settings and faculty endorsements to increase student participation in surveys or interviews.
- Retain some face-to-face interviewing of students.
- Facilitate better communication with and among faculty and staff who interact with students.
- Champion the participation of Berkeley and local K–12 schools in national surveys.
- Consider performing more research before proceeding with the collection of data from first-year graduate students on a campus-wide level.
- Commit to an ongoing assessment that adapts to evolving technologies and business practices.

## Acknowledgments

The Leadership Development Program (LDP) Student IT Experience project team would like to express our special thanks to the following individuals who made this project possible:

Our primary sponsors, Susanna A. Castillo-Robson, Associate Vice Chancellor of Admissions and Enrollment, and Shelton Waggener, Associate Vice Chancellor of Information Technology and CIO, for providing the vision and the opportunity;

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And our LDP program manager, Inette Dishler, Principal Learning Consultant, Center for Workforce Development, who led by example and inspired us to do our best work.

Thank you as well to the many students, Berkeley staff, and staff at our peer institutions who provided valuable input and support for this project.

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# Introduction

"The Student Experience: Understanding the Gap between Our Current Technology Offerings and Student Expectations," is a research project sponsored by Associate Vice Chancellor of Information Technology (IT) and CIO, Shelton Waggener, and Associate Vice Chancellor for Admissions and Enrollment, Susanna A. Castillo-Robson. We were assigned this project as part of our work in University of California, Berkeley's Leadership Development Program (http://hrweb.berkeley.edu/ldp/ldp.htm).

Our team was asked to provide an analysis of the technology needs and expectations of incoming undergraduate and graduate students and compare them to those solutions and environments currently offered.

Our sponsors gave us the following background to explain the need for this research:

> Berkeley[1] spends over $100 million annually on technology investments. The vast majority of this is spent on maintaining existing legacy systems and infrastructure. There are limited funds available for investment in new technology initiatives. Typically, new technology development and deployment happen at the departmental level and are rarely integrated or shared with other departments across campus that could benefit. Student systems are a prime example of this fragmentation: the resulting overall student experience is considered less than ideal, especially when compared to peer institutions. Berkeley students today are required to log in to different systems, each with its own set of unique credentials, and sometime fill out forms online that are nothing more than digitized versions of paper-based forms that have no supporting work flow associated with them. They are forced to move between disparate systems for each of the objectives they have on campus—enrollment, registration, financial aid, student life, academic—extending all the way through their status as alumni.
>
> The autonomous nature of the different operating groups and departments within Berkeley has led to this fragmentation of experience, and existed long before the first computer was deployed on campus. Yet Berkeley administration is responsible for supporting a student body that comes to campus having experienced fully-integrated online tools and services that have been customized to meet their needs. As members of the Net Generation[2] most Berkeley students have multiple digital communication devices (computers, cell phones, PDAs), multiple online accounts, and digital personas that are completely disconnected from any system they are introduced to when applying to or attending Berkeley.

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1. The official name of our campus is University of California at Berkeley. This is frequently abbreviated as UC Berkeley, and further shortened to Berkeley as we have done throughout this report.
2. This term was coined by psychologist Don Tapscott in his book *Growing Up Digital* and referenced in the Wikipedia article http://en.wikipedia.org/wiki/Net_Generation.

> While the gap between Berkeley's systems and students' expectations did not develop overnight, the accelerating pace of their expectations, combined with the university's shrinking resources and limited offerings, represents a serious and growing disparity between the online experience of Berkeley students and that of students at our peer institutions. Even where Berkeley has made significant advances in online technology implementations, many of the new-to-Berkeley technologies may still miss the mark to truly integrate into the Net Generation students' world.[3]

Our assignment was to document the current situation using a three-pronged approach:

- Interview incoming freshmen, transfer students, and graduate students in their first year at Berkeley to document their level of satisfaction with the current technology environments.
- Interview key providers of current student technology solutions on campus and document their current solutions as well as roadmaps of future offerings.
- Identify best-in-class offerings for students at peer institutions, with a particular focus on other University of California campuses.

Based on our research and analysis, we were asked to:

- Provide recommendations that identify the most prevalent trends and needs of students.
- Identify where on the continuum of satisfaction and results the university's current portfolio of technical solutions meets their needs.
- Prioritize the areas of technological enhancement the campus should focus on to achieve an environment that students will embrace and use to stay connected to the Berkeley community throughout the continuum of prospective student through alumni.
- Recommend a mechanism through which to continue to gather the trends of new and prospective students in future years.

This report describes our research process and gives our findings and recommendations, including those for establishing continued assessment of new Berkeley students' technology needs and expectations of student services.

3. We worked from an unpublished proposal. See also Student System 2012 Wiki announcement, http://students.berkeley.edu/wiki/ow.asp?p=LDPProject&a=print.

# Process

## Scope

Our first task was to learn more about technology, technology in education, and technology at Berkeley. We reviewed articles, surveys and data from Berkeley, the University of California Office of the President and the broader educational community to familiarize ourselves with the issues.

On September 15, 2006, we met with our sponsors and key members of their organizations who were assigned to work with us as functional sponsors. Our discussion of the project proposal and the sponsors' expectations of the team helped us to formulate our approach.

Due to the short timeline for this project (mid-September 2006 through January 2007), we refined the initial project scope to include the work that would be most valuable and possible. Our refined project scope was:

> *The [Leadership Development Program] project will provide an analysis of, and process to, capture the needs and expectations of incoming first-year undergraduate and graduate students for technology on campus versus what solutions and environments are currently offered.*

## Organization

As the team became more educated on the project, we agreed on a broad interpretation of several terms. We included digital communication and entertainment devices, along with computers, online tools and websites in our working definition of information technology (IT). We also chose to define the term "student experience" by three categories: (1) administrative tasks, such as registering, enrolling in classes, and paying tuition; (2) the academics tasks of learning, demonstrating knowledge and doing research; and (3) the full-range student life activities, including social activities, student groups, and residential life in Berkeley dormitories.

Our sponsors' proposal charged us with three primary research tasks: to investigate the perspectives of students, to learn from key providers of student services at Berkeley, and collect best practices from peer colleges and universities. We chose to create internal team experts on each target population by dividing into three corresponding subgroups. In this way we could best saturate ourselves in the various perspectives and more efficiently complete the research.

Each subgroup developed its approach under the guidance of the functional sponsors, and through review at weekly meetings of the full team.

*Students*
The "student" team chose to use multiple methods, as suggested by the project proposal, to document students' level of satisfaction with current technical environments at Berkeley: focus groups, individual interviews, and electronic surveys. In addition, the team informally learned about students through visiting residential halls, computer centers, classrooms, and libraries. In order to better understand the student IT environment, team members familiarized themselves with websites commonly used by students.[4] The team also interviewed campus administrators[5] for advice and assistance on conducting surveys, and to understand how best to identify representative student members.

*Key Providers*
Campus providers of student services have a unique vantage point from which to see the gap of student IT expectation and experience. The "key providers" team members worked with the sponsors to identify key providers of current student technology solutions in the three student experience categories mentioned above: administrative, academic, and student life. These interviews allowed us to document current applications, any "workarounds" currently in use, and roadmaps of future offerings. This data was useful in identifying where the current portfolio meets the needs of the students. This team also developed expertise in the organizational structure of Berkeley, and were able to hear first-hand about the "autonomous nature of operating groups" and "fragmentation of experience" at Berkeley mentioned by our sponsors.

*Peer Institutions*
Our team's charter was to identify the best-in-class offerings for students at peer institutions, with a particular emphasis on offerings at other University of California campuses. Those team members who focused on peer institutions accomplished this by working with the sponsors to identify appropriate peer institutions, identify the best contacts at those institutions, and create a strategy to recruit them for interviews by telephone or email.[6] In their effort to create a manageable set of interview questions, the team members considered multiple bases of comparison among institutions. As part of their information search, they also conducted internal interviews,[7] exploring some of the best practices identified within Berkeley.

## Focus Groups

We composed questions on IT usage and satisfaction with IT at Berkeley to explore topics of interest with student focus groups. Through examination of recent campus surveys as well as background reading and discussion with the sponsors, we chose open-ended questions to allow for elaboration and discussion. Participants signed consent forms to allow us to take notes in the session and a handout was provided to them with more detailed information on the project.[8] All the student focus groups took place in conference rooms at the campus Recreational Sports

4. See Appendix J., IT and Online Resources for the New Students at Berkeley.
5. See Appendix K., Student Input Contacts.
6. See Appendix P., Best Practice Interviewees.
7. Also included in Appendix P.
8. See Appendix F., Student Interview and Focus Group Flyer and Handout.

Facility, a location familiar to the students. At least two team members conducted each focus group.

Most of undergraduate students we interviewed were solicited through visiting two sections of Reading and Composition 1B, a required English course for many first-year students. By promoting the project in class we were able to recruit nearly 60 potential participants, and the lecturer, Lani Kask, agreed to award extra credit for their participation in the university-sponsored research project. Of those recruited, 21 participated in focus groups, five completed individual interviews, and 15 reviewed and tested the undergraduate electronic survey before we distributed it across campus. Other students interviewed were recruited through personal contacts.

To help us recruit transfer students, Eva Rivas, the director of Berkeley's Transfer, Re-entry, and Student Parent Center, allowed us to post flyers in the Center and enter a notice in the weekly electronic newsletter sent to transfer students. Additionally, we were able to recruit students in Education 198, a transition skills course for new transfer and re-entry students.

Our contact in Berkeley's Graduate Division, Judi Sui, financial and data information manager, distributed information about our project to an email list of Student Affairs Officers for the campus graduate programs and placed a notice in the online graduate student newsletter, *eGrad* (http://www.grad.berkeley.edu/publications/egrad/november06.pdf). Unfortunately, our efforts to recruit graduate student participants by posting flyers in graduate student housing were not effective because of strict rules regulating research in Berkeley residential facilities.

We conducted seven focus groups between November 1 and 8, 2006: three comprised of freshman, two of transfer students, and two of new graduate students. We offered pizza as an incentive for participation.

## Interviews

Our team conducted individual interviews of students, key campus providers, and administrators at peer institutions.

*Students*

We conducted one-on-one interviews with individuals from each student population of interest: first-year undergraduates, undergraduate transfer students, and graduate students. We modeled the questions after those we used for the focus group, adding options for detailed follow-up.[9] We informally tested the questions on student employees in our own departments before using them in the interviews. All but one of the interviews were conducted in person, by one team member, at mutually agreed upon locations. One interview was conducted over the phone. We offered $5 Jamba Juice cards as an incentive to all interviewees who were not already receiving extra credit for their participation.

9. See Appendix G., Student Interview and Focus Group Questions.

In all we held 13 individual interviews: nine freshman, three transfer students, and one graduate student.

*Key Providers*
We started with campus organizational charts to identify which administrators would best know about the student IT experience and campus technologies. We discussed our choices with the project sponsors to insure all relevant providers were included and to prioritize the interviews.

We held eighteen 30- or 60-minute interviews.[10] Two team members conducted each interview. We asked each key provider of services four broad-based questions:

1. What do you provide currently that has a technology element to it?
2. What are students' greatest comments or requests about these technology services?
3. What are your frustration points?
4. What do you want to know from students?

More specific questions were asked of some providers based on their area of work.

*Peer Institutions*
Our team worked with our sponsors to help identify colleges and universities that are Berkeley's peers. Factors we considered included public vs. private, size of undergraduate population, quality of education, quality and level of research, and national reputation for excellence in some area of IT implementation. Our sponsors identified individuals at each institution, in most cases, their peers: high-level administrators in either student services or information technology.

We developed interview questions in collaboration with the sponsors and Katherine Mitchell, organizational development consultant at the Center for Organizational Effectiveness. Due to the vast numbers of IT solutions that might be compared, we chose to ask each institution to share with us only their best practices. We saw this as a way to elicit the most information from our interviewees and to capture best-in-class offerings in our survey of institutions.

To recruit participants, we sent emails requesting a telephone interview and a list of proposed questions. This proved ineffective. Of the five campuses initially contacted, only three responded. Our sponsors then reviewed the targeted list of 22 schools and not only identified high-level administrators to contact at each, but also offered to send out emails in their name, introducing our team and requesting help with our research. After these emails were sent (November 22 and November 28), we followed up with our own emails requesting phone interviews, again including the questions. The strategy proved successful and we were able to interview 28 people at 16 peer institutions between November 17 and December 18. In addition, University of British Columbia, and one of the two Carnegie Mellon contacts provided a written response to our questions but were not interviewed.

Each phone interview lasted approximately an hour. Of the 16 schools, four were University of California campuses: UC Davis, UCLA, UC San Diego, and UC Santa Cruz. The other

10. See Appendix L., Key Providers at Berkeley, for details.

12 schools were Carnegie Mellon University, Duke University, Harvard University, Indiana University, Massachusetts Institute of Technology, Stanford University, University of Chicago, University of Maryland, University of Michigan, University of Minnesota, University of Wisconsin, and Yale University.[11]

**Electronic Surveys**

Since students are so frequently surveyed on campus, and because of our concern for "survey fatigue," we chose to coordinate our electronic surveys with existing campus surveys as much as possible. Permissions to access undergraduate and graduate students are handled by separate organizations, so we organized two survey efforts and ended up conducting three electronic surveys:

- An undergraduate student survey written specifically for this project ran November 30 to December 15, with 156 responses.
- One graduate student survey, using questions that had been used in a University of California study of undergraduates, ran November 9–18, with 129 responses.
- A second graduate student survey, consisting of questions co-written by team members and Graduate Division staff to include in their annual survey of new students, ran November 19–December 31, with 323 responses.[12]

The survey questions were developed based on what we learned in the focus groups. We tracked patterns in our focus group responses, identified themes, and worked with our sponsors to prioritize issues. For the undergraduate survey, we then drafted questions to address the most important themes, and reviewed them with our sponsors and with our own student employees. Once we had our questions, we entered them into Berkeley Office of Student Research's Questionnaire Development System[13] and re-circulated them for review and formal testing by 15 of our volunteer Reading and Composition 1B students.

To survey graduate students, we were fortunate to be able to coordinate with Berkeley's Graduate Division and its annual survey of new graduate students.[14] We were permitted to use selected questions from an existing survey used on undergrads at University of California campuses[15] and hoped that, by using them with graduate students, we would be able to compare the two populations. Berkeley's Graduate Division staff allowed us to link this graduate survey—a stand-alone module created in Zoomerang (http://www.zoomerang.com)—to their annual survey for a limited time (ten days).

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11. See Appendix P., for a complete list of those interviewed.
12. See Appendixes A., B., and C., for a complete list of questions for each survey.
13.. Wahl, Kenneth R., *OSR's Questionnaire Development System,* Office of Student Research, Division of Student Affairs, University of California, Berkeley.
14. Sui, Judi, *First Year Student Survey*, Graduate Division, University of California, Berkeley, done annually.
15. Center for Studies in Higher Education, *University of California Undergraduate Experience Survey (UCUES) 2005 and 2006*, part of Student Experience in the Research University project, Center for Studies in Higher Education, University of California, Berkeley, for more information online see, http://cshe.berkeley.edu/research/seru/ucues.htm and https://osr2.berkeley.edu/Public/surveys/ucues/menu.html.

After the ten days, the Zoomerang module was closed and other IT-related questions, co-written by our team and Andrew Kent Smith, senior research analyst of Graduate Division, were incorporated and ran for the remainder of the survey period.

The incentive for completing the undergraduate survey was a drawing for one of two $50 American Express gift cards. Since Berkeley's Graduate Division does not use incentives in its surveys, we provided none to graduate students.

**Project Team Analysis**

The team first analyzed the data collection results in separate clusters:

- Notes taken from the student focus groups and interviews were reviewed for repeating themes across the three student populations.[16] We also compared results to those of focus groups on the topic of "Teaching, Learning and Technology" conducted by the Division of Undergraduate Education in October 2006.[17] Results of the interviews with key providers were compiled and analyzed.[18] Interviews with peer institutions were analyzed and best practices identified by school.[19]

- Review of the electronic survey data for undergraduates was completed by loading the results into the Questionnaire Development System and cross-referencing. Responses from the graduate Zoomerang survey were downloaded into an Excel spreadsheet for review and cross-referencing. Berkeley's Graduate Division provided a summary of the results from the technology questions included in their survey.[20]

The team then moved from data collection to data analysis and findings.

16. See Appendix H., Student Interview and Focus Group Input Summary.
17. Schrager, Cynthia D., in preparation for the upcoming biannual Symposium on Teaching, Learning, and Technology, "Points of Convergence: Faculty, Student, and GSI Focus Group Findings," "Summary of GSI Focus Group," "Summary of Faculty Focus Groups," and "Summary of Student Focus Groups," unpublished materials, Division of Undergraduate Education, University of California, Berkeley, October 31, 2006.
18. See Appendix M., Key Providers Interview Themes, Appendix N., Key Provider Codes for Cross-Case Analysis, and Appendix O., Key Provider Input Summary.
19. See Appendix R., Best Practice Input Summary by School, and Appendix S., Emergent Themes from Peer Institutions.
20. See Appendixes A., B., and C. for survey results.

# Findings

At MIT, one of our peer institutions, the student body is comprised of innovative students, some of whom create and design their own systems, and some who have their own servers. These students take ubiquitous wireless for granted because they have it. Students have designed systems which catch on and are adopted by campus administration. MIT believes the students should be involved in information planning and implementation.

As newcomers to a university environment, new Berkeley students have a lot to adjust to; they need to obtain housing, negotiate transportation and parking, learn their way around campus, get to know their peers, choose classes, and sign up for classes. During our focus groups and individual interviews, a broad range of issues surfaced regarding adjusting to Berkeley, a campus located in a dense, urban environment, where the cost of living is high.

Faced with these challenges, students turn to the tools they are accustomed to, connecting with their friends and family through cell phones and the Internet. Armed with their Connecting@Berkeley CDs[21] and CalNet IDs,[22] many students receive quick connection to the network upon arrival at Berkeley, but soon find out—to their surprise—that they don't have wireless everywhere. Many don't even arrive with network cables. Yet in the dorm rooms these cables are necessary if the students wish to connect to the Internet as Berkeley does not provide wireless Internet access in the dorm rooms at this time. Berkeley students face other confusing situations when services and websites don't operate in ways they expect.

The following describes some demographics about incoming Berkeley students, what we learned about their technology knowledge and use, their satisfaction with Berkeley's existing technologies, and their access to those technologies. It offers a description of IT in student life across the course of a college career and the recommendations given by our interviewees for collecting student feedback.

### Who are Berkeley's Incoming Students?

In 2006, there were an estimated 8,975 incoming students at Berkeley: 4,200 freshman, 2,000 transfer students, and 2,775 new graduate students. 19% of new undergraduates are first-generation college attenders.[23]

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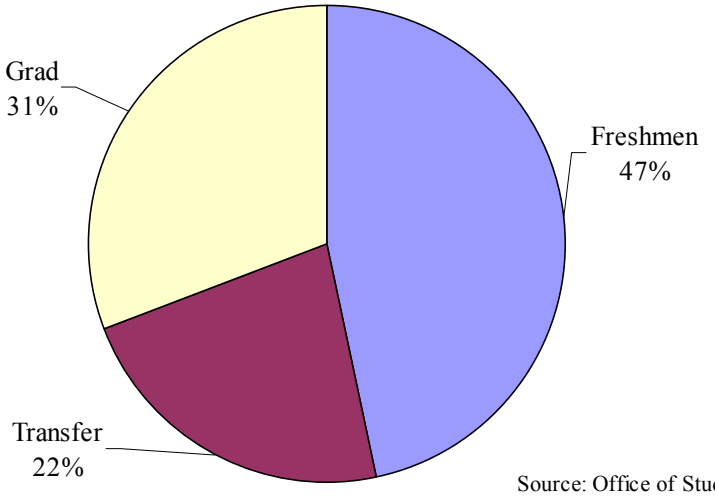
21. Connecting@Berkeley CD is an award winning, free set of tools to secure and connect computers, (http://cab.berkeley.edu/).
22. CalNet is an identity management service that assigns students with a CalNet ID to use to obtain online access to secure sites, (https://calnet.berkeley.edu/).
23. UC Berkeley News, "Student Facts at a Glance, Fall semester 2006," *UC Berkeley Web Feature*, UC Berkeley News, August 23, 2006, http://www.berkeley.edu/news/media/releases/2006/08/23_facts.shtml.

**Berkeley Incoming Students by Class Standing, Fall 2006**




Most freshmen are adjusting to living away from home for the first time and 95% of them live in university dormitories. These dorms offer a great deal to the students, including Academic Learning Centers with technology training and support, as well as formal and informal advising opportunities and counseling. Still the learning curve for adjusting to college is high. Only 33% of new transfer students live in university housing. Combining the remaining 67% of transfers with the 5% of freshmen not in university housing means that 1,550 new undergraduates face adjustment to Berkeley without access to the additional support of dormitory living.

Freshmen who are beginning their education are encouraged to explore broadly with the future goal of narrowing their focus to choose a major in their fourth semester. Transfer students, who enter as juniors, must accomplish these tasks in a condensed time frame, having only two semesters to declare a major. Intensifying this pressure is, as upperclassman have recently observed, that fact that undergraduate students may take two to three years to find their niche at Berkeley.[24] Transfer students transitioning from community colleges also may be accustomed to having more interaction with faculty than they will at Berkeley, as well as a curriculum focused on applied learning rather than research.

The graduate student body is made up of a diverse group, including students enrolled in two- and three-year master's programs as well as PhD students who stay on Berkeley's campus for many years. Unlike the majority of undergraduates, graduate students have already chosen a focus, and their departments, rather than the campus in general, are their gateways to Berkeley. The following shows the distribution of graduate students by college, with nearly half being in business, engineering, or law. By contrast, 73.5% of undergraduates are in Letters and Science.[25]

24. Schrager, unpublished materials, October 31, 2006.
25. Demographic information used in this section is derived from queries of registration data through the Office of Student Research website (https://osr2.berkeley.edu/).

**Distribution of Incoming Berkeley Students by College (Fall 2006)**

| Undergraduates | Graduate students |
|---|---|
| Letters and Sciences: 73.5% | Letters and Science: 21% |
| Engineering: 12% | Engineering: 13% |
| Natural Resources: 6.5% | Natural Resources: 2.4% |
| Chemistry: 3.5% | Chemistry: 3.8% |
| Environmental Design: 3% | Environmental Design: 4.3% |
| Business: 1.5% | Business: 20% |
| | Law: 13.5% |
| | Public Health: 5.4% |
| | Education: 5.2% |
| | Social Welfare: 3.4% |
| | Optometry: 2.7% |
| | Journalism: 2% |
| | Public Policy: 2% |
| | School of Information: 1.3% |

Graduate students possess different skills and experience than undergraduates. Administrative tasks are less likely to overwhelm them because they have acquired those skills during the successful completion of their undergraduate education. New challenges facing graduate students are the tasks of learning to teach or do original research. Also since 17% of the new graduate students are international students, many are making cultural and language adjustments. Improved IT and student services for these issues may be the priorities for graduate students.

As a result of this and recognizing the diversity of the Berkeley student population, we focused primarily on the undergraduate student. We do however address our findings covering the graduate student as appropriate.

## Incoming Students' Technology Knowledge and Use

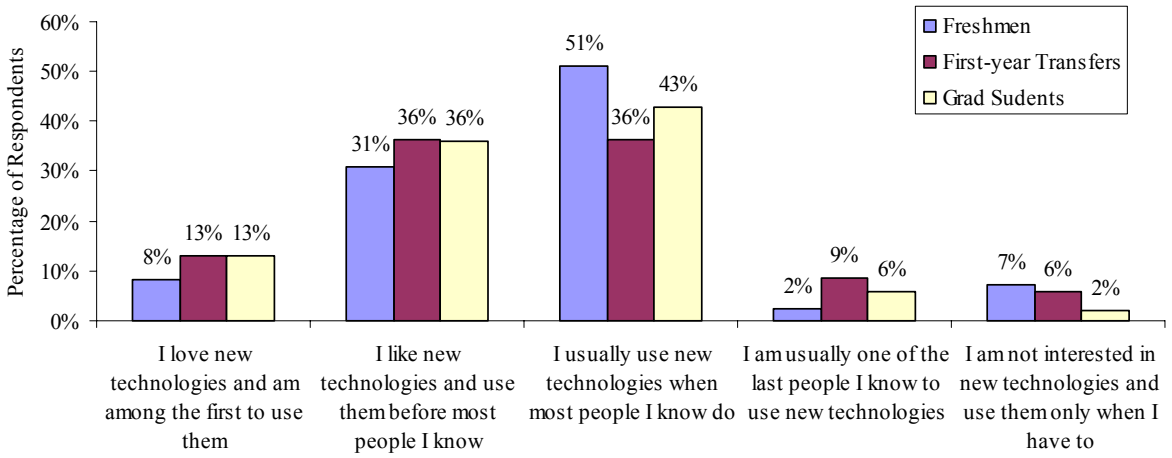
Most incoming students arrive at Berkeley with their own laptops and cell phones. Many students own iPods or other MP3 players and own digital cameras. They use email and are familiar with Microsoft Office software. Most students have used some sort of social networking service such as MySpace and regularly use Google and Wikipedia for reference. The majority visit YouTube and make use of the Internet for shopping and gaming. Most freshmen use text messaging and instant messaging (IM) extensively. Some of our freshmen respondents regularly use webcams, Voice-Over IP, and Skype, and do website design, programming, and building or customizing of computers.

The incoming students we interviewed represent a broad range in their level of interest, experience, and skill with technologies. One uniform response we received was that most students will choose to use new technologies when people they know and associate with use them. While undergraduates have been characterized as being increasingly "internet-savvy,"[26] the degree of receptivity to new technologies varies among students.

26. Levin, Douglas, and Sousan Arafeh, *The Digital Disconnect, the Widening Gap between Internet-Savvy Students and Their Schools*, American Institute for Research, Pew Internet and American Life Project, August 2002, http://www.pewinternet.org/PPF/r/67/report_display.asp.

This chart shows incoming Berkeley students' self-assessed receptivity to new technologies. What we found was a bell curve distribution. The largest proportion of students report using new technologies "when most people I know do" (51% of freshmen; 36% of new transfers). However, some students "love" new technologies (8%; 13%), while others report using them "only when I have to" (7%; 6%). This variation may reflect similar variation in receptivity to technology in general. It may also suggest a range of preferences regarding the IT experience at Berkeley, meaning that the university may not be able to satisfy all students with a given IT solution. Instead, the university may be forced to focus on only a portion of students, or, if resources allow, to develop multiple solutions to satisfy students of varying levels of technology receptivity.

**The Receptivity of Incoming Berkeley Students to New Technologies**




Source: LDP group electronic surveys; 84 freshmen, 69 first-year transfers, and 129 grad students responding.

## Students' Satisfaction with Berkeley's Existing Technologies

Incoming students like some of the technologies they have encountered at Berkeley. We documented several endorsements of the Media Resources Center (film library), the paperless bills, webcasts of classes, the library search technology, the Cal 1 Card (http://cal1card.berkeley.edu),[27] and library proxies (which allow students to access library materials remotely). Almost universally, incoming students liked myBerkeleyApp, the common name given to myBerkeleyApplication, (http://students.berkeley.edu/myberkeley/) the secure website through which new students are linked to the resources they need to smooth their transition to campus.

Areas that students identified as deficient and needing improvement included:

- Difficulties scheduling classes.
- Holes or flaws in the wireless coverage.

27. The Cal 1 Card is Berkeley's official ID card. In addition to serving as a digital photo ID card, it permits access to campus buildings and services and can be used as a debit card for campus dining and area vendors.

- The limited capacity of and high degree of spam coming through CalMail, Berkeley's email service.
- The lack of real-time billing available through Campus Accounts Receivable System (CARS).
- Insufficient technology support when needed.
- Limitations of computer labs and lab hours.
- The problem of multiple websites, specifically having to visit multiple unrelated sites to complete administrative tasks.

It should be noted that while our focus group questions centered on technology, many student responses raised student personal safety issues. There was discussion of secure elevators, proximity keys, crime, and reluctance to cross the campus at night. Personal safety concerns were particularly stressed by female students who commute to Berkeley and depend on technology resources on the campus. The computer labs were identified as not being located on campus in easily and safely accessed areas.

**Student Access to Berkeley's Technologies**

Access to online resources is crucial for students to conduct their daily tasks: academic, administrative, and social. Yet we can't assume that all students have the same level of access.

One population needing attention is those students who lack financial resources for up-to-date computers or internet access from home. These students arrive at Berkeley at a distinct disadvantage. One transfer student who needs to rely on university-run computer centers described her dilemma. One of her professors gave assignments on Saturday evening that were due Monday morning. The campus computer centers that are run by Berkeley's Information Services & Technology department are not open Sunday mornings, so this student needed to plan her weekend around doing her assignment Sunday afternoon. This caused her to essentially lose 12 hours of work time that could have been devoted to the assignment.

Other students who may be particularly vulnerable to technology access issues include commuters who do not have the advantages of on-site technology support, advising, and coordinated academic centers; first-generation college students who may not have family resources to help them with academic advice; students with family responsibilities; students with disabilities; and international students who may be adjusting to a new culture and language. Specialized support is available for each of these groups on campus through the Student Learning Center; Transfer, Re-entry, and Student Parent Center; Disabled Student Center; and Support for International Students Services. However, with the exception of the Assistive Technology Center administered through the Disabled Student Center (http://dsp.berkeley.edu), technology support is not addressed specifically by these centers.

**The Student IT Experience**

The IT experience of Berkeley students can be viewed as a series of individual and important steps toward a higher education. Employing previously acquired tools and skills to determine

their first steps towards campus life, and influenced by the world around them, the new "IT-enabled" student is armed and ready to embrace learning with minimal interference. However, barriers arise along the way, forcing students and the university to examine internal processes and develop corrective strategies. These strategies range from those developed on campus to those purchased from outside vendors. Whatever the answer, today's students use and will continue to use technology to maximize their educational experience at Berkeley.
Let's look at the steps undergraduates take in their IT experience.

*How it begins*
Students consider pursuing higher education during their high school years and begin gathering information on their options during that time. They more than likely start by researching information on the Internet. In our undergraduate survey we asked students to identify the key factors in their decision to attend Berkeley.

- 95% of the freshmen selected academic reputation.
- 69% selected location.
- 49% selected a program in their field of interest.
- 45% selected cost.
- 11% said friends attending.
- 8% said family tradition.

When transfer students were asked the same questions, the results were as follows:

- 88% selected academic reputation.
- 54% selected location.
- 46% selected a program in their field of interest.
- 23% selected cost.

When we asked focus group participants how important the quality and type of technology offered at each of the institutions was to their decisions to apply, 70% of freshmen and 68% of transfer students indicated that it was at least somewhat important.

This finding is supported by our discussions with peer institutions. All report that students who experience a one-stop, self-service system when they are prospective students feel that that sets the tone for their future university experience. A school gains a competitive advantage when the prospective student's initial IT experience is smooth.

*Choosing classes*
Once a school is selected as a "best match," a high school student, but more typically his or her parents, begins the enrollment process. Key providers interviewed agreed that students and their parents handle this process together. Most undergraduate students are not yet ready to handle all of their bills, find the answers to their academic questions, plan their residential experience, or register for classes without the help of their parents. Therefore it is important that systems are provided that can serve both the student and the parents during enrollment (and thereafter). It was identified that the desire for a separate parent log-in to student information (limiting the

parent to information the university may release and information the student agrees to release to the parents) would be a welcome addition to a student's experience at Berkeley.

Students interviewed indicated they appreciated myBerkeleyApp and felt it was useful in their application process. However, myBerkeleyApp only goes so far. When it came to choosing courses, students indicated more information would have been helpful in their decision. The current technologies leave a lot to be desired. For example, key providers indicated that during class registration there is no real time indication if a class is full. This causes frustration for the students, administrators, and faculty.

As it currently works, before selecting classes, students need to ascertain the requirements needed for general education and for their major. When looking at specific class choices, they need to review prerequisites and check final exam dates. Each element of this is on a different website and is difficult to find. The course selection software does not permit students to save drafts of their schedules, so they have to start over if they move to another website to get needed course information.

When asked about their satisfaction with the existing process for selecting their class schedule, 54% of our freshmen respondents were somewhat satisfied with the process, 16% very satisfied, and 30% neutral to very dissatisfied. Of the transfer students surveyed, 53% were somewhat satisfied, 27% very satisfied, and 20% neutral to very dissatisfied. Outside of the usual resources used in selecting classes (http://www.berkeley.edu/catalog and http://schedule.berkeley.edu) students also used departmental websites because those are the only sources through which they can find information to assist them in choosing their classes, find out about their majors, or learn about other academic requirements.

One popular workaround is Aman's Interface to Berkeley's Online Schedule (http://www.ocf.berkeley.edu/~amanb/makeSched/). This was developed by a former Berkeley student to help himself plan his semester schedule. He eventually made it publicly accessible and word of its usefulness spreads from student to student each semester.[28] Other similar student-developed workarounds exist, but none have been endorsed or supported by administration.

Students indicated that a satisfactory online class schedule would include: a syllabus for every course, sample schedules of students in their year with their intended major, more information on major requirements and prerequisites, and a set of FAQs regarding scheduling. Students also expressed the desire for a student evaluation system of faculty. One student introduced us to an innovative alternative to FAQs that currently exists on the US Army recruiting website: an avatar cartoon officer who directly answers any question you ask (http://www.goarmy.com/ChatWithStar.do). This student envisioned a similar online Berkeley Cal-Student Orientation (CalSO) counselor who could help with class selection, course descriptions, recommendation of classes to take for given majors, and other matters as an ideal best practice.

28. For more details see Appendix J.

At the peer institutions that have information-rich systems for enrollment, student satisfaction is high. Four schools interviewed use the Peoplesoft/Oracle Student Information Systems (SIS); University of Michigan and Duke University have highly customized models while the University of Wisconsin and Indiana University have done limited customization. Not surprisingly, those universities that have customized the interface are more satisfied with the software, as are their students.

Other schools have developed their own SIS using an online shopping module approach for choosing classes in real time. At these schools, the course catalog is integrated into the course selection. MIT's home-grown course enrollment system, interestingly, was developed by students. It includes an integrated catalog with a scheduling function that identifies what the student needs to take, provides suggestions for fulfilling the requirement, and builds a grid to display the schedule as the student moves through the process.

The shopping cart feature included in the online enrollment at some universities allows students to select their schedules ahead of their enrollment date and store these in a "shopping cart" otherwise known by names such as Backpack (University of Michigan) and Book-bag (Duke).

All schools we interviewed are aware of the importance a single location for course enrollment and are working to make their sites as rich as possible including course descriptions, syllabi, and course evaluations.

*Administrative needs*

In every survey and focus group, students indicated that wireless connectivity is essential. Key providers agreed that the expectations of students are that they have access to campus systems all day, everyday, or 24/7/365. This is echoed by the peer institutions. Every school interviewed heard the same demand from students. Currently, only two offer wireless access throughout their campus buildings, including dorms rooms. Carnegie Mellon University was the first of those we interviewed to offer these services; MIT completed its wireless campus in fall 2005.

Students also want IT assistance 24/7. Key providers identified a need for a central call-in, email or live chat to answer questions and help students to navigate complex systems. Currently at Berkeley, a student needs to ascertain who provides a particular service before he or she can contact the proper helpdesk.

This problem is exemplified by the setup in Moffitt Library (Berkeley's main undergraduate library). The computer lab on the bottom floor is run by the Information Systems and Technology department. All other computer and printing services in the library are provided by the library. To complicate matters, copy pricing is different within the lab than elsewhere in the library, and each system requires a separate method for payment for copies and printing.

Centralized helpdesks are in place at the University of Chicago. They are also in place at Carnegie Mellon and Duke, though not available 24/7. UC Santa Cruz has received positive feedback from its recent move to include residential support with all other IT support under one department. UC Davis also provides centralized support. There, all service requests, whether by

student, faculty, or staff, are processed through the same office. The helpdesk presently operates from 7:00 a.m. to 9:00 p.m. weekdays but they plan to move to 24/7.

Students want to access one location, with one log-in, for all the services they need at Berkeley. Students at Indiana University, MIT, and University of Wisconsin are able to access all campus student services sites using one log-in password. These students have expressed high satisfaction with this feature, finding it a time-saver and a convenience.

Key providers interviewed also noted the need for a single database, or databases that can communicate better than they do today. A data warehouse that can connect or manage all the campus systems with student data would be ideal.

Other administrative innovations at peer institutions include:

- **University of Wisconsin.** Prospective students are given access to the university's portal prior to admittance so they can trace their application status. This enables them to become familiar with the features of the portal prior to acceptance and arrival. Prospective students are given campus email accounts as well to allow direct communication with the university.
- **Harvard University.** Harvard has added an advising component to its student portal. Before arriving on campus, students can go online to see who their advisors are and advisors can track their assigned students online.
- **MIT**: A blog set up by admissions allows incoming students to talk to administrators. This helps answer incoming students' questions and has been successful at helping alleviate students' and parents' fears and anxieties relative to starting college.
- **University of Minnesota.** Minnesota offers online information to support the financial literacy of new students, educating them on the risks of taking on debt. The university also offers an online graduation planner for students considering continuing on to graduate school.
- **Duke University.** Several years ago, Duke initiated a program giving iPods to students for use in courses requiring the technology. Since today most students come to campus with their own iPods, the giveaway was not as great a hit as anticipated. Currently, Duke makes iPods available to students who need them for courses such as music appreciation and language courses. At the conclusion of the course the student can purchase the iPod at a deep discount. Duke also has an arrangement with Apple Computer to allow students to download applicable course material.
- **UC San Diego.** When faced with projected increased enrollments of 1,000 students per year, San Diego implemented Blink (http://blink.ucsd.edu/), a content management system that provides a centralized database. This has allowed San Diego to handle the increased enrollment without increasing staff. This system is also expandable and departments not yet linked to San Diego's student system, Tritonlink (https://tritonlink.ucsd.edu) can have nodes added and be allowed appropriate, customized access to the centralized database.
- **University of Maryland.** Their student-designed registration system/scheduler shows seat availability, notes regarding prerequisites, waitlist and hold list information, pictorial grids, and registration in real time with catalog updates every hour. It even indicates

walking times between classroom locations warning students when calculated times exceed ten minutes.

- **University of Chicago.** The popular O-Festival is a new student/parent event that offers entertainment along with the issuance of the student's ID cards and a backpack with connection tools and instructions. It is a welcoming face-to-face event that allows students to get help from fellow students and to make connections in their residence halls.
- **UC Davis.** The registrar's office now offers IT support on Saturdays so faculty members have assistance posting grades electronically. One office, client services, provides IT support for the entire campus and campus population—staff, students, and faculty. In this way, customers know who to call for IT support. This office answers 95% of calls in less than 60 seconds.

One of our peer institutions, UC Santa Cruz, noted that Berkeley has an enviable "best practice"; they consider our orientation programs for computing services in the residence halls best in class.

*Academic Needs*

Once students have enrolled and begun classes, their academic needs become apparent. Students interviewed identified several IT-related academic improvements: they would like their instructors to use websites and podcasts more; they would like more collaborative forums, and they want an improved email system.

Email is an indispensable part of academia; 99% of students interviewed say they used email to communicate with at least one faculty member this academic year. Having said that, they are dissatisfied with CalMail, the major complaints being too much spam, not enough storage for their academic and social needs, and the cumbersome nature of the system.

Key campus providers agreed that CalMail's shortcomings are a constant complaint among students. Many students work around this problem by using Google's Gmail instead and many have suggested that CalMail would benefit from looking and functioning like Gmail. All peer institutions interviewed struggle with the issue of how to meet the demand from students who want university email services to offer the same features as Gmail or Yahoo! mail. Interestingly, all schools, with the exception of Yale, are considering outsourcing their email.

This email issue can lead to serious communication difficulties. Currently all schools communicate with students and send official university information and documents through the university email system. This can have a negative impact on communication if the students are forwarding their university email to another email address. They may not receive all documents or communications if the system's spam filter removes it.

Duke University students have gone so far as to suggest that in order to get the students' attention, any official university communication or documents requiring a response should be sent via postal mail rather than email. There is concern, of course, about how often students truly check their campus physical mailboxes.

Students and faculty (from key provider interviews) note the need for a more technologically advanced classroom environment. Students want and need both wireless access in the classroom

and power to the seats. Students want more webcasting and podcasting. This is not to replace the classroom experience, but rather to enhance it with additional information delivered through various avenues of technology.

Another area of need identified by the students is for the increased availability of computer labs: increased lab hours and more computer labs.

Many universities comment that there has been an increased call for collaborative environments for students, both online and in physical space. Berkeley students interviewed mentioned a desire for student-to-student online forums; 49% of the freshmen and 46% of the transfer students have used a collaborative online tool for classwork at Berkeley, while 48% of the freshmen and 59% of the transfer students would value having more online collaborative tools available for future classes.

Both our students and students at peer institutions want face-to-face collaborative environments. To address that need, University of Chicago has created state-of-the-art media labs with flexible furniture, collaborative spaces for groups and teamwork, and an area where food can be eaten. It is open 24/7 and is popular with the students. This is part of University of Chicago's goal to make technology spaces into social spaces, creating a welcoming place where technology needs are met while students are comfortable to stay and interact with one another.

*Social IT*

A vital part of a university student's life is the social side: making friends, joining groups, meeting colleagues, and expanding their circles. Today's high school students are already quite adept at facilitating collaboration through social IT web services such as email, instant messaging, and MySpace.

In our surveys, when asked if students had searched for personal information about another student using a search engine, most confirmed that they had. Most also affirmed that they had used a social networking site such as Facebook. However, student interest in a social networking service run by Berkeley was mixed. In a survey of graduate students, 50% indicated they would be interested in such a service. The most popular potential functions were organizing student groups and organizing events. Reasons for not using such a service included having friends who do not attend Berkeley and already having a service that meets their needs. In face-to-face discussions, students expressed concerns that university involvement in social networking would ruin the social networking atmosphere and reduce their privacy from the university.

All the peer institutions we interviewed are considering whether or not they should have their own version of Facebook. Most have come to the same conclusion our study shows: that resources should be focused elsewhere instead of duplicating services students already have. Yale students have created http://yale.station.org —a web-based networking site—that works well for them given their small student population (5,200 undergraduates). The University of Wisconsin student body has asked the university to support a campus version of Facebook so they can check out the profiles of students enrolled in their classes. The university is considering the students' request but also assessing the ways students use social IT services to understand how or if the university could meet their needs.

**Collecting Student Feedback**

In today's environment, student needs change rapidly. We asked Berkeley students how they would recommend administrators identify the expectations of students in the future. In the focus group and interviews, freshmen indicated that electronic surveys with incentives were effective, as well as holding technology forums, and having a technology discussion board. Transfer students felt students don't take electronic surveys seriously and that face-to-face contact is crucial. Graduate students agreed with transfer students. They went even further to state that focus groups have the advantage of brainstorming and going into more depth than individual interviews.

Overall, all student groups interviewed agreed that student involvement in campus technology decisions is the most valuable. Recommendations ranged from employing students in the CIO's office, perhaps on a student task force or in Graduate Student Research positions, to having instructors champion student involvement through class projects or extra credit offerings. Another recommendation identified the need for a feedback button on the Berkeley website where comments and opinions could be submitted. Students emphasized, however, that this will only work so long as this feedback was reviewed regularly and it was demonstrated to the community that suggestions were being heard and acted upon.

Key providers indicated that resource-rich departments were more knowledgeable about their students' needs than resource-poor departments. As a result, these departments are more likely to build their own systems and collect student data. Tapping these resources for the benefit of resource-poor departments would be beneficial to the entire campus and student body.

Most peer institutions we spoke to include students in testing and development of systems. Duke has student projects on technology innovation; MIT uses a course enrollment system designed by its own students; University of Maryland similarly uses a student-developed registration system; University of Wisconsin uses students to test upgrades to the portal in exchange for early registration; and Yale has a student social networking system. UC San Diego beta-tested its class planner and has followed up with a focus group to help decide how to write its interface to Tritonlink (the student system that provides student portal). Other institutions have student employees in various administrative and academic departments; they value them as a very good source of feedback regarding student satisfaction and expectations. Most schools employ students to work their helpdesks, in the media labs, and in the residence halls; this has also been successful in supporting the students and their technology experience.

Ideally, when arriving on campus, the student must have connectivity to function within the institution. The systems must function seamlessly to maximize student efforts to simply get things done. When a problem occurs or help is needed, prompt and accurate assistance on a personal level is expected. This is where the gap between student expectations and what Berkeley current offers is greatest.

## Recommendations for Shrinking the Gap between Student Expectations and Campus IT Offerings

We have noted that students arrive at Berkeley for the most part having been raised in a 24/7, anytime, anywhere digital world. They are used to a world in which friends and family are constantly connected, wirelessly and conveniently. Many incoming students have used state-of-the-art websites and technologies and expect no less from Berkeley. They expect to be able to transact their business: enroll in school, select and enroll in courses, navigate financial aid issues, seek and receive advising, interact on course projects, and communicate with administrators and teachers quickly and efficiently. Ideally the services they need will be provided within a one-stop, online environment which will enable them to connect to all the services they need using one log-in and authentication.

Our interviews with campus administrators, students, and peer institutions have led us to the following recommendations. These recommendations are based on a perfect-world scenario with no consideration of costs. However, because no such world exists, we have prioritized these recommendations. Our general guideline in prioritizing is that it is best to start with student-centered systems, accommodating the students' need for convenience and enhanced communication.

We first identify what Berkeley should do to decrease the gap between what students expect, technologically, and what they have currently. We recommend the following:

- Expand wireless access everywhere, including dorm rooms.
- Expand the functionality of and improve the look of myBerkeleyApp.
- Offer more channels of communication between campus administration and students and parents.
- Centralize helpdesk support across campus.
- Create a one-stop online environment for students that covers all their academic and administrative needs.
- Ensure that labs on campus and in residential halls are safe, coordinated across campus, and equipped with what today's student needs.
- Standardize administrative websites with coordinated navigation and interface.
- Simplify and unify the student information system.
- Expand technology training and support for students.
- Expand technology training and support faculty, and staff.
- Offer extended support to students whose access to or familiarity with technology may be limited.
- Contract with software and hardware vendors for deeper student discounts.

We also give recommendations of how Berkeley can achieve these specific goals:

- Use existing commercial resources where appropriate. Consider outsourcing email service to Gmail or another commercial provider.

- Choose, design, and develop systems that offer flexibility to accommodate upgrades and enhancements to meet the rapidly changing student technology needs.
- Foster a student-centered culture when developing systems; be in touch with the students at all levels of technology development and assessment.
- Break down campus silos.
- Use Customer Relationship Management (CRM) systems.
- Think strategically and globally about IT needs at Berkeley.

**What Berkeley should do to close the IT gap**

In order for Berkeley to close the IT gap we recommend that it improve the following specific services and processes.

**Expand wireless access everywhere, including dorm rooms.** "Wireless everywhere" is one of the primary expectations of incoming students. They expect no less from an institution of the caliber of Berkeley.

**Improve and expand myBerkeleyApp.** This is first experience applicants have with Berkeley's IT services. This initial IT experience, if designed with ease of navigation, could present a competitive advantage over other schools. Berkeley should keep itself immediately competitive with peer schools with an up-to-date, friendly, easy-to-use site for applicants and newly admitted students.

**Offer more channels of communication between campus administration and students and parents.** One suggestion students made was for a blog on myBerkeleyApp for applicants, newly admitted students, and parents to communicate directly with the admissions office and ask questions regarding application and what to expect when they arrive on campus. A similar service at MIT is considered a success.

**Centralize helpdesk support across campus.** Provide a single helpdesk service (combining telephone, online, and face-to-face support) that handles all faculty, student, and staff requests concerning any technology on campus, ideally 24/7.

**Create a one-stop online environment for students that covers all academic and administrative needs**. This should connect to all these services using one log-in/authentication.

- *Course enrollment.* Design an interface similar to the retail online sites students are used to, such as Amazon.com. The site should, at a minimum, allow students to pre-plan their classes in real time, save their schedules using a shopping cart interface, and create schedule grids. Ideally, the site would include current, complete course descriptions, course evaluations, syllabi, prerequisites, faculty evaluations, text requirements, degree audit information, and "what if" scenarios for course requirements for different majors.
- *Course management.* Give access to course assignments, exam schedules, and grades.
- *Finance*. Provide financial aid, loan information, loan payments, and billing information in real time.
- *Online transcript request.* Provide paperless, electronically transmitted transcripts.

**Ensure that labs on campus and in residential halls are safe, coordinated across campus, and equipped with what today's student needs.** Every lab should be the following:

- *Convenient and accessible.* Ensure labs are in safe, convenient, and accessible environments. Extend hours of operation as much as possible, ideally to 24/7.
- *Comfortable.* Furnish each lab with flexible, comfortable, living-room-like furniture both to facilitate collaborative work, and to enhance social interaction, in a technology center with the goal of bringing socializing and technology together—each to enhance the other. See University of Chicago for a "best practice" in this area.[29]
- *Fully equipped.* Expand lab offerings to include more multimedia and more design, film, and video production.
- *Coordinated campus-wide.* Provide remote printing capability at computer centers and coordinate the Berkeley-sponsored printing programs.

**Standardize administrative websites with coordinated navigation and interface.** A common concern of students and staff is the many diverse and non-coordinated websites a member of the Berkeley community must learn. Standardization would include one look and feel and streamlined, coordinated navigation for administrative student sites, to make them recognizable and familiar. Standardization could be achieved most readily if the Information Systems and Technology department were to work towards minimum web-design standards for all university websites.

**Expand technology training and support for students.** We recommend that Berkeley expand the amount of training and the ways it is offered. The new student technology orientation is well received and very popular. Expand it, either through online tutorials or face-to-face training. Be sure to include those students not living in dorms. Where possible, use video and animation for disseminating information to students, in the manner of the advising tips included on the Transfer, Re-entry, and Student Parent Center website (CalMax video tips on advising/finances at http://reentry.berkeley.edu/newstu.htm), or the Residential Computing education cartoon promoting safe behavior online (http://www.rescomp.berkeley.edu/besmart/).

**Offer extended support to students whose access to or familiarity with technology may be limited.** For commuters and students who don't live on or near campus and therefore don't have access to residential hall services, increase campus computer center hours, allow them access to the academic centers in the dorms, and offer campus-based assistance with technology purchases and support.

For low-income students initiate a computer equipment loan program and financial assistance for meeting minimum computer connectivity standards.

For all students expand and enhance the services currently offered by Berkeley's The Scholars Workstation (http://www.tsw.berkeley.edu):

- Contract with software and hardware vendors for deeper student discounts.
- Offer technology recommendations undergraduate students can understand.

29. See Appendix R., for details.

- Help students navigate consumer choices.
- Offer comprehensive help through the entire process of buying, setting up, and using new software or hardware.
- Expand services hours.

**Expand technology training and support for faculty and staff.** One cause of the gap between students and campus is the limited technological experience of some faculty and staff. Faculty may not know what classroom technologies are offered at Berkeley, or they may feel uncomfortable using them. Offer expanded technology training to faculty to increase their comfort level. This will help faculty members keep in step with students.

Similarly, offer expanded technology training to administrative staff to increase their technological dexterity and comfort with technology, thus making it easier for them to work with students and support faculty.

**Simplify and unify the student information system (SIS).** Develop a one-stop, self-service student information system using a packaged SIS either off the shelf or customized, or work with a consortium such as Kuali Student, an open source project Berkeley helped to initiate (http://students.berkeley.edu/wiki/ow.asp?KualiAppendixB_Admissions).

**How Berkeley should achieve these goals**

**Use existing commercial resources where appropriate.** When developing student-centered systems, consider purchasing packaged software, either customized or off the shelf. One example of a system that is being reviewed is CalMail. This campus email online interface has proven to be unpopular with students because of its limitations. Consider outsourcing email to either Google or Yahoo! as many peer universities are doing. This both serves as a time saver and reduces the learning curve for students, who are already familiar with these commercial services. Further, it provides the storage capabilities that students deem necessary for their email service.

**Choose, design, and develop systems that offer flexibility to accommodate upgrades and enhancements to meet the rapidly changing student technology needs.** For example, enrich the course enrollment site with degree audits, what-if scenarios, faculty evaluations, and advising appointments, and work with students to consider what enhancements should be next.

**Foster a student-centered culture when developing systems: be in touch with the students at all levels of technology development and assessment.** Fostering a student-centered culture and working with students directly will encourage system developers to think as students, and to better anticipate their needs and expectations.

- Hire students to develop, test, and review systems.
- Include students in advisory councils and committees
- Survey and interview students regularly about their needs and expectations.
- Incorporate forums or blogs into campus websites to foster communication about technology.
- Create synchronized live chats to capture the student voice in online dialogues.

- Create case competitions for students to present their solutions to challenging technology problems, such as the design of a new course enrollment system, with a monetary or scholarship award.

**Break down campus silos.** Foster a culture at Berkeley that builds relationships between units across campus. Spearhead efforts to pool resources to develop systems having one look and feel to accommodate all populations. Provide a forum for departments to get together to discuss their needs and include them in planning and development of systems.

**Adopt Customer Relationship Management (CRM) systems.** A robust CRM would enable a better understanding of students' interests and provide more targeted and helpful information to students, such as suggesting other courses a student might want to consider based on what a student has previously selected. A CRM system provides a database storehouse of student activity which can be used to better determine what services to provide students to meet their needs in a personalized format.

**Think strategically and globally about IT needs at Berkeley.**

- *Create a marketing analyst position*. The position should focus on the digital trends and needs of the future market, high school students, and continue to research best practices in peer universities, and explore global IT trends. The position could provide future trend analysis to help in the design and development of student IT services.

- *Emphasize the link of IT development to Berkeley's core educational mission to advocate for dedicated resources for research and development***.** IT innovation is critical to Berkeley's ability to adapt to rapid changes in teaching and technology, and learning and technology. New technology tools within emerging organizational and business models will allow the university to educate more students with fewer and shrinking resources. Best-in-class utilization of technology tools will enhance Berkeley's ability to attract research funds and continue its leadership in influencing innovation in California. Berkeley's CIO needs to disseminate this message across campus.

- *Continue collaboration and networking with other colleges and universities through conferences and committees.* To take advantage of our size and our peer institutions, work in collaboration with the other UC campuses to develop systems to increase student access to services, courses, and events and, as a result, reap economy of scale. Currently, Vice Chancellors of Enrollment Services at the various UC campuses meet monthly via phone conferences. Directors from Financial Aid, the Registrars Office, and Admissions hold similar phone meetings. Computing client services staff participate in an annual UC Computing Services Conference. In the fall of 2006 the first conference of Enrollment Services Assistant Vice Chancellors was held in Burbank. It is also notable that the UC Information Technology Guidance Committee has been working to coordinate university-wide resources with campus visits, a dedicated website (http://www.universityofcalifornia.edu/itgc/), updates, periodic reports, and a concerted effort to gather student input. These meetings can provide a collaborative culture so that Berkeley can leverage resources available across the UC system.

## Recommendations for Continued Assessment of Student Expectations

Our team was asked to recommend mechanisms through which Berkeley administration can continue to monitor the technology trends of new and prospective students. We recommend a multi-pronged data collection approach.

- Use existing campus electronic surveys to learn about trends in students' technology ownership, usage, expectations, and learning preferences.
- Coordinate the timing of independent surveys with the calendars of Berkeley's Office of Student Research and Graduate Division.
- Integrate feedback mechanisms and customer satisfaction polling into administrative service websites.
- Partner with other Berkeley researchers across organizational and departmental boundaries to learn from their existing research, advocate for inclusion of technology-relevant questions in their future research, and collaborate on joint research.
- Use academic settings and faculty endorsements to increase student participation in surveys and interviews.
- Continue to conduct regular face-to-face interviews with students.
- Facilitate better communication with and among faculty and staff who interact with students.
- Champion the participation of Berkeley and local K–12 schools in national surveys.
- Consider performing more research before proceeding with the collection of data from first-year graduate students.

**Use existing campus electronic surveys to learn about trends in students' technology ownership, usage, expectations, and learning preferences.**

*Advocate for the inclusion of technology-related questions in the Office of Student Research's annual survey of new students.*[30] This survey, administered each August by Director Gregg Thompson, is conducted with newly admitted undergraduate students before they arrive on campus. It has historically had a very high response rate. If this recommendation is adopted immediately, there is time to select questions (or develop and test new ones) for inclusion in the August 2007 survey.[31]

*Plan ahead for possible inclusion of technology-related questions in the University of California Undergraduate Experience Survey (UCUES).* The UCUES survey (http://ucues.berkeley.edu/), developed through the Center for Studies in Higher Education's Student Experience in the Research University Project, is an online survey of all University of California undergraduates. The survey is administered by Thompson and housed and run from Berkeley's Office of Student

30. Thomson, Gregg, et al., *Survey of New Students*, Office of Student Research, Division of Student Affairs, University of California, Berkeley, conducted annually.
31. Gregg Thomson, director, Office of Student Research, interview by authors, December 13, 2006.

Research. The UCUES questions are determined by a committee of Thompson and his peers at the other eight UC campuses with undergraduate students. The survey consists of a core set of questions which are asked of all students, plus several modules that are given to subsets of students. UCUES core questions will run for five years, 2005–2009. One module, on student services, includes questions that rotate year-to-year. Since the UCUES survey is done in the spring semester, typically one week after spring break, it would be possible to advocate for inclusion of technology-related questions in the student services module in 2008. Strategizing for inclusion in the core questions should be a long-term goal.

*Use questions from the UCUES 2006 wildcard module focused on technology.*[32] These 20 questions, created collaboratively by several Berkeley researchers, reflect good collective expertise. Since they were launched last year, using them in 2007 and future years would quickly produce longitudinal results. Also, Office of Student Research practice ensures the internal consistency of these questions.

*Select survey questions that prompt students to describe their world of technology.* The average freshman is unlikely to be able to articulate expectations of student services in an electronic survey outside the context of those services. A better strategy to understand their expectations is to ask students what IT tools they own and use, when and how often they use them, and for what purposes. Changes in patterns of ownership and use can be tracked for emerging trends.

We found it important to include a question to help us distinguish different types of students: the average users of IT from early adopters who pushed technological limits, and those who need help to utilize IT tools from those who provide that help to their peers.[33] Having this information as a data point might help identify emerging technologies that early adopters are using. It could also help identify if those students at the bottom of the technology curve are getting increasingly behind over time.

Since in our research we found that students are looking for campus resources and opportunities through their social networks, we recommend including a question on the use of online social networking. Another line of questioning to consider in the future is the interest in online forums that link prospective students, current students, and alumni, allowing students to ask questions and get advice from those who have gone before them.

**Coordinate the timing of independent surveys with the calendars of Berkeley's Office of Student Research and Graduate Division.**

In a research-rich environment such as Berkeley, it is important to protect students from being asked to participate in too many studies, making them unresponsive to all. To avoid "survey fatigue," both Thomson and Judi Sui, Financial and Data Services Manager, in Berkeley's Graduate Division stress the importance of carefully timing and coordinating all proposed surveys.

32. See Appendix D., UCUES Wildcard Module on Technology, Survey and Results, for complete list of questions.
33. Finn, Megan, (Ph.D. student at the School of Information), *The Techne-Mentor*, part of Freshquest, University of California, Berkeley, May 11, 2005, http://groups.sims.berkeley.edu/ikids/freshquest/FreshQuest%20-%20The%20Techne-Mentor.pdf.

**Integrate feedback mechanisms and customer satisfaction polling into administrative service websites.**

The scope of this project includes both research-based and customer service-based inquiry. Questions about specific services or websites may best be incorporated into the sites themselves. In this way students can give quickly provide feedback when they are within the specific IT environment and their experience is fresh. From the student point of view, it would be ideal for each Berkeley website to include a contact for the person or organization responsible for the site and a link for making a complaint or asking a question.

In contrast to lengthy research surveys, there is also the possibility of taking short one- or two-question polls that are quick to complete. The website myBerkeleyApp incorporates such polls effectively. This type of survey tool can be easily launched to gather information on new, unexpected, or timely issues.

As another way to optimize the convenience of both researcher and student, investigate options for passive collection of information concerning the use of Berkeley websites or online tools in a way that respects the concern over the loss of privacy voiced by some of the students we interviewed.

**Partner with other Berkeley researchers across organizational and departmental boundaries to learn from their existing research, advocate for inclusion of technology-relevant questions in their future research, and collaborate on joint research.**

Organizations, surveys, and studies to consider include**:**

- UC Teaching, Learning, and Technology Center (IT Systemwide Guidance Committee)
- Center for Studies in Higher Education (research projects on Education in the Digital Age, the Research University)
- Division of Student Affairs, Office of Student Research (annual survey of new students, UCUES, demographic information collection)
- Division of Undergraduate Education (biannual Symposium on Teaching, Learning & Technology, Education Technology Committee)
- The Library, Doe / Moffitt Libraries (development of survey questions on academic engagement for UCUES and NSSE)
- Graduate Division (annual survey)
- Academic Senate, Committee on Computing and Communications
- Faculty and Graduate Student Researchers at relevant schools and colleges, such as the Haas School of Business, School of Information, School of Education, and College of Engineering
- Division of Student Affairs, Residential & Student Service Programs, Office of Student Development (Living/Learning survey 2002–2006)
- Division of Student Affairs, Computing (surveys linked to the statement of intent to register and myBerkeleyApp)
- Division of Student Affairs, Residential & Student Service Programs, Information Technologies, Residential Computing (customer satisfaction polls in academic learning centers)

**Use academic settings and faculty endorsements to increase student participation in surveys and interviews.**

When targeting first-year students, visiting entry-level or transition classes specifically designed for new students is a good way to access groups of potential student participants. For our student interviews, it was particularly difficult to recruit graduate students because there are no defined first-year classes. In the future it would be crucial to gain the endorsement of each of the various departments to aid in reaching and recruiting these students.

If the decision is made to recruit student participants from the residential halls it is important to plan at least one semester ahead and gain approval from the Office of Student Development and the Office for the Protection of Human Subjects.

**Continue to conduct occasional face-to-face interviews with students.**

While running electronic surveys is certainly the more cost-effective method of questioning students, face-to-face interviews offer the advantage of going more in depth and possibly discovering new areas for inquiry. We found the participants of our focus groups enthusiastic about the synergy created from coming together—it broadened their thinking about the topic. Even a very modest interview pool could greatly supplement an electronic survey. It would be a more flexible tool than a once-a-year survey in responding to a new problem or technology. One shortcut for organizing focus groups would be to access existing groups, such as classes, workshops, student government groups, or student employees. Another would be to use highly-motivated student groups (such as the employees at the Residential and Student Services Programs' Academic Learning Centers) not only as participants but as recruiters of other students and as peer interviewers.

**Facilitate better communication with and among faculty and staff who interact with students.**

There exists at Berkeley a great deal of untapped institutional knowledge. The following groups of employees could supply important data through their observations of students and assist in recruiting student participants for research:

- Student advisors and counselors
- IT professionals who staff computing centers
- IT professionals who support departments
- Faculty
- Librarians
- Staff in centers that target specific, vulnerable student populations (disabled students, transfers, first-generation college attendees, etc.)
- Staff and volunteers with the Center for Educational Partnerships[34] who interact with pre-college students, their parents, and local K–12 teachers

34. UC Berkeley Center for Educational Partnerships (http://studentaffairs.berkeley.edu/apa/) is a consortium of organizations that provide education opportunities for local K–12 students, their parents, and their teachers.

The Office of the CIO or Admissions and Enrollment could host forums, briefings, or workshops that highlight IT issues directed towards one or more groups. They could also create an IT Advisory Council with representatives from each group. Members could be recruited by contacting individuals who already participate in committee surveys on education and IT for recommendations.

**Champion the participation of Berkeley and local K–12 schools in national surveys.**

Although national surveys have limitations and do not replace UC- or Berkeley-specific surveys, they do provide quantifiable measures and contribute to studies that may identify important societal trends. For the first time this spring Berkeley plans to participate in the National Survey of Student Engagement.[35] This survey asks a sample of freshmen and a sample of seniors about academic challenge, collaborative learning, student-faculty interaction, different types of learning, and gains in practical competence and personal and social development. UC Merced and UC Davis also participate in this survey (http://nsse.iub.edu/html/quick_facts.cfm).

In order to collect information about future college students, organizations are looking to the pool of prospective students in K–12 schools. The UC Berkeley Center for Educational Partnerships endorses NetDay's Speak Up (http://www.netday.org/), a survey that gathers information about technology ownership and usage from students in grade school, middle school, and high school, as well as from their parents.[36] Since recruitment is a critical part of admissions, this particular survey may yield information that could make Berkeley student services both more efficient and more effective.

**Consider performing more research before proceeding with the collection of data from first-year graduate students.**

It is challenging to survey both first-year undergraduates and graduate students with the same research instrument. The developmental tasks of undergraduate and graduate students are significantly different; different questions concerning technology-related behavior may be appropriate. A graduate student's experience is also influenced most strongly by his or her graduate programs so that university-wide, centralized solutions may have less impact on their academic or administrative needs or their social lives. Graduate students' technology experience also most likely varies dramatically by their chosen field of study, making sampling challenging to accomplish.

When surveys are needed, work with Berkeley's Graduate Division to determine the best survey tool and timing for gathering data. Options include advocating for the inclusion of technology-related questions in the annual Graduate Division survey done each fall, or creating a new survey to be distributed at the same time as the undergraduate new student survey. The August timing of the undergraduate survey has the advantage of reaching students before they arrive on campus and are faced with what is typically a grueling first semester. Doing an August

35. NSSE Institute, *National Survey of Student Engagement, Engaged Learning: Fostering Success for All Students*, *Annual Report 2006*, NSSE Institute, Indiana University, Bloomington, http://nsse.iub.edu/html/annual_reports.cfm.
36. NetDay, *Speak Up Survey 2006*, NetDay, 15707 Rockfield Blvd., Suite 550, Irvine, CA, 92618, 2006, http://www.netday.org/SPEAKUP/speakup_your_data.htm.

survey, however may interfere with the effectiveness of the Graduate Division's fall survey and, since admissions are handled separately by each graduate program, a unified contact list may not be available in time.

**Long-term considerations**

In order for a continued assessment of students' expectations to be successful, the research effort needs to be ongoing. We recommend a commitment to survey students annually for a minimum of three years. Ideally one person or one organization, would serve as its advocate—selecting questions, analyzing data and networking with other researchers.

We recommend the assessment also be ongoing in a sense of evolving. As the technology changes, the assessment needs to adapt. A dedicated advocate, well-connected to a research community, would be in the best position to make decisions about revising or adding questions to the survey instrument, or devising a new assessment strategy altogether. Something to consider for the future, would be an investigation of customer relationship management technologies that could automate the capture, storage, and analysis of student information.

Lastly, technological, cultural, and organizational changes may combine in the future to allow for a collaborative process of designing IT environments. Shelton Waggener envisions a time when "every user [becomes] a sophisticated consumer *and* producer of technical solutions."[37] In this case, there will no longer be a need to solicit and capture the "student voice." Instead, university administrators will be researching how best to channel a steady stream of free-ranging, creative conversations.

37. Waggener, Shelton, "Stepping up and Embracing Change," *iNews from the Chief Information Officer*, UC Berkeley information technology news channels, The Regents of the University of California, February 13, 2006, http://istpub.berkeley.edu:4201/bcc/Spring2006/875.html

# Conclusion

As our team took on this project we immersed ourselves in the student perspective. To understand the integrated (and increasingly technology-dependent) lives of students, we surveyed and talked to students, and we interviewed the administrators on campus who work closely with students and who work closely with technology. We also interviewed administrators of student services and IT support at peer institutions to see how their best practices support their students.

Overall we found that, whatever problems may exist, and whatever technical services Berkeley students may desire, they are willing to adapt to existing services. They value the knowledge of their professors, the intelligence of their peers, and the reputation of the university, and for these benefits they will tolerate necessary inconveniences. They are also hopeful that—with their participation—technology services will continue to improve.

The problem areas identified by providers of IT services match those identified by the students themselves. And the best practices we collected from peer institutions closely match what our students want. All of this reiterates themes in the literature and national trends.

Importantly, the patterns we observed and needs cited also match the analysis, planning, and efforts already underway to improve student services and IT coordination at Berkeley.[38]

Today's incoming students rely heavily on IT in their daily lives. Whether relying on a course website, managing financial aid online, or instant messaging friends, students use IT as a tool to help them accomplish their goals more easily. Technology helps them learn, interact, and simply enjoy themselves. The ways students use technology are diverse and ever-changing.

As a provider of IT solutions, the university must continually respond to the changing IT expectations of our students. Given limited resources, solutions must be cost-effective and flexible. They must be designed with student needs in mind and with the recognition that those needs will continue to change.

As the campus continues to develop strategies to improve its services, it is essential to continue to assess the needs of the whole student to create an IT environment that enables all students to maximize their college experience.

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38. Specifically, Waggener, Shelton, as lead of planning process and chair of the Campus Technology Council, "Critical issue 2: Student experience, prospects through alumni," *Campuswide Information Technology Strategic Plan*, Technology@Berkeley, Regents of the University of California, http://technology.berkeley.edu/planning/strategic/critical2.html.

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# Bibliography


Berkeleyan, "Birgeneau: 'We serve California extraordinarily well'," *Berkeleyan*, Volume 35, Number 10, University of California, Berkeley, October 19, 2006

Bergman, Barry, "It's a Relative Thing…, For some, the start of college is fraught with angst, fear, and other emotional baggage. Someday, maybe students will understand," *Berkeleyan*, University of California, Berkeley, August 30, 2006

Bleed, Ron, "A Hybrid Campus for the New Millennium," *Educause Review*, January/February 2001, Educause, pp 17-24, http://www.educause.edu/ir/library/pdf/erm0110.pdf

Cabacungan, Cecille, Lesley Clark, Rachelle Feldman, Paula Flamm, Gail Ford, Kati Markowitz, Stacey Shulman, and Dan Sullivan, *Student Portal Project*, Leadership Development Program, University of California, Berkeley, May 22, 2002

Carlson, Scott, "The Next Generation Goes to College," *Information Technology*, Volume 52, Issue 7, The Chronicle of Higher Education, from the issue dated October 7, 2005, http://chronicle.com/free/v52/i07/07a03401.htm

Carnevale, Dan, "E-Mail Is for Old People," *Information Technology*, Volume 53, Issue 7, The Chronicle of Higher Education, from the issue dated October 6, 2006, http://chronicle.com/weekly/v53/i07/07a02701.htm

Caruso, Judy Borreson, *2006 UW-Madison Student Computing Survey Report*, Division of Information Technology, University of Wisconsin, Madison, July 2006, http://www.doit.wisc.edu/about/research/2006/DoITStudentSurveyReport06.htm

Center for Studies in Higher Education, *University of California Undergraduate Experience Survey (UCUES) 2005 and 2006*, part of Student Experience in the Research University project, Center for Studies in Higher Education, University of California, Berkeley, for more information online see, http://cshe.berkeley.edu/research/seru/ucues.htm and https://osr2.berkeley.edu/Public/surveys/ucues/menu.html

Chenoweth, Lynda Salter, *Effective Staff Analysis in Institutions of Higher Education*, Claros Consulting, 18012 Stanford Court, Sonoma, CA 95476, 1995

Christoph, Kathy, Sponsor; Jane Terpstra, Project Lead; Jeff Bohrer, Les Howles, Kathleen Konicek, and Christine Lupton, Project Team; Dave Carter, Data Analysis; Cid Freitag, Communications; and Sirisha Karamchedu and Mike Graif, Project Assistants, *2006 Academic Technology Survey, Results and Summary*, Academic Technology Department, Division of Information Technology, University of Wisconsin, Madison, July 2006, http://www.doit.wisc.edu/about/research/2006/2006_AT_Survey_Rpt_08-08-06-1.pdf

Christopher, Tony, "2003–2004 MyBerkeleyApplication Student User Survey, Executive Summary" My Berkeley App Survey, on *Student Affairs Technology Wiki*, University of California, Berkeley, http://students.berkeley.edu/wiki/ow.asp?MyBerkeleyAppSurvey

Cockrell, Cathy, "Grad Students to Enjoy One-Stop Resource Shopping," *Berkeleyan*, University of California, Berkeley, November 9, 2006, p 3

———, "Spotlight on Undergraduate Outcomes," *Berkeleyan*, University of California, Berkeley, November 29, 2006, p 1

Edelstein, Wendy, "Tackling Technological Truancy," *Berkeleyan*, Volume 35, Number 12, University of California, Berkeley, November 2, 2006, p 1

Educause, *Student Guide to Evaluating Information Technology on Campus 2006*, Educause, http://www.educause.edu/studentguide

Educause Learning Initiative (ELI), "Facebook," (August 2006), "YouTube," (September 2006), and "Google Earth," (October 2006), *7 Things You Should Know about…*, a series of briefings on emerging technologies, Educause, http://www.educause.edu/7ThingsYouShouldKnowAboutSeries/7495

Finn, Megan, Ph.D. student at the School of Information, *The Techne-Mentor*, part of Freshquest, University of California, Berkeley, May 11, 2005, http://groups.sims.berkeley.edu/ikids/freshquest/FreshQuest%20-%20The%20Techne-Mentor.pdf

———, *Freshquest Research Instruments*, Freshquest, University of California, Berkeley, July 24, 2006, http://groups.sims.berkeley.edu/ikids/freshquest/data.html

Finn, Megan, and David Schlossberg, *Adoption and Negotiation of Technology in the Lives of Berkeley Freshman*, Freshquest, University of California, Berkeley, May 2005, http://groups.sims.berkeley.edu/ikids/freshquest/FreshQuest%20-%20Adoption%20and%20Negotiation.pdf

Harley, Diane, Shannon Lawrence, Sandra Ouyang, and Jenny L. White, editors, *University Teaching as E-Business? Research and Policy Agendas: Selected Conference Proceedings*, CSHE.9.02., Center for Studies in Higher Education, University of California, Berkeley, South Hall Annex #4650, Berkeley CA 94720-4650, June 2002, http://cshe.berkeley.edu/research/ebusiness/

Harley, Diane, Jonathan Henke, Shannon Lawrence, and Flora McMartin, Center for Studies in Higher Education; Michael Maher, Graduate School of Management at UC Davis; and Marytza Gawlik and Parisa Muller, Graduate School of Education, *Costs, Culture, and Complexity: an Analysis of Technology Enhancements in a Large Lecture Course at UC Berkeley*, Center for Studies in Higher Education, University Of California, Berkeley, March 2003

Harley, Diane, Jonathan Henke and Shannon Lawrence, *Why Study Users?, an Environmental Scan of Use and Users of Digital Resources in Humanities and Social Sciences Undergraduate Education*, CSHE.11.06, Center for Studies in Higher Education, University of California, Berkeley, South Hall Annex #4650, Berkeley CA 94720-4650, September 2006, http://repositories.cdlib.org/cshe/CSHE-11-06

Heidinger, Tim, "Student Systems 2012: Rebuilding Berkeley Student Systems," *iNews: Planning, architecture, development,* Information Systems & Technology, University of California, Berkeley, September 26, 2006, http://istpub.berkeley.edu:4201/bcc/Fall2006/944.html

Henderson, Gabe, "Henderson: MySpace 'friendships' lack time and energy," *Iowa State Daily*, Opinion section, September 14, 2006, http://media.www.iowastatedaily.com/media/storage/paper818/news/2006/09/14/Opinion/Henderson.Myspace.friendships.Lack.Time.And.Energy-2270932.shtml?sourcedomain=www.iowastatedaily.com&MIIHost=media.collegepublisher.com

Information Services and Technology, *Customer Satisfaction Survey*, modules for staff, faculty, students, University of California, Berkeley, October 2006

Jackson, Gregory A., "Open Source Is the Answer, Now What Was the Question?," *Information Technology*, Volume 51, Issue 5, The Chronicle of Higher Education, from the issue dated September 24, 2004, http://chronicle.com/weekly/v51/i05/05b01701.htm

Jafari, Ali, Patricia McGee, and Colleen Carmean, "Managing Courses, Defining Learning: What Faculty, Students, and Administrators Want," *Educause Review*, July/August 2006, Volume 41, Number Four, Educause, pp 50-71, http://www.educause.edu/apps/er/erm06/erm0643.asp

Krieger, Lisa M., of the San Jose Mercury news, "Campus Computer, Gadget Fixers Revel in Popularity," *Belleville.com*, Belleville News-Democrat and wire service sources, November 12, 2006, http://www.belleville.com/mld/belleville/15987554.htm

Kvavik, Robert B., and Judith B. Caruso, *ECAR Study of Students in Information Technology*, *2005-Convenience, Connection, Control, and Learning*, Educause Center for Applied Research (ECAR), Vol. 6, 2005, October 12, 2005, http://www.educause.edu/content.asp?PAGE_ID=8964&bhcp=1

Lee, Ellen, "Social Sites Becoming Too Much of a Good Thing," *San Francisco Chronicle*, November 2, 2006, accessed through sfgate.com, http://www.sfgate.com/cgi-bin/article.cgi?file=/c/a/2006/11/02/MNGG3M4KB31.DTL

Lenhart, Amanda, Research Specialist, Lee Rainie, Director, and Oliver Lew, Research Assistant, principal authors, *Teenage Life Online, the Rise of the Instant-Message Generation and the Internet's Impact on Friendships and Family Relationships*, The Pew Internet and American Life Project, June 2001, http://www.pewinternet.org/PPF/r/36/report_display.asp

Levin, Douglas, and Sousan Arafeh, *The Digital Disconnect, the Widening Gap between Internet-Savvy Students and Their Schools*, American Institute for Research, Pew Internet and American Life Project, August 2002, http://www.pewinternet.org/PPF/r/67/report_display.asp

Makam, Vam, with contributions from Allison Bloodworth and Tu Tran*, e-Berkeley Haas Student Portal User Needs Analysis, Final Report*, School of Information, University of California, March 22, 2005

Murphy, Paula, Dan Greenstein, and Katherine Mitchell, *IT in Student Experience, Summary Report*, systemwide discussion sponsored by the Information Technology Guidance Committee, University of California, Oakland, California, June 23, 2006

NetDay, *Our Voices, Our Future, Student and Teacher Views on Science, Technology and Education,* national report on 2005 speak up event, NetDay, 15707 Rockfield Blvd., Suite 550, Irvine, CA, 92618, April 2006, http://www.tomorrow.org

Net Day, *Speak Up Survey 2006*, NetDay, 15707 Rockfield Blvd., Suite 550, Irvine, CA, 92618, 2006, http://www.netday.org/SPEAKUP/speakup_your_data.htm

Noel-Levitz, Inc., *E-Expectations Class of 2007 Report: Engaging the "Social Networking" Generation*, Noel-Levitz, Inc., 2101 ACT Circle, Iowa City, IA, 52245, http://www.noellevitz.com/NR/rdonlyres/425D56C3-9ACD-4A90-9782-F70ED7AC3CF2/0/EExpectationsClassof2007.pdf

NSSE Institute, *National Survey of Student Engagement, Engaged Learning: Fostering Success for All Students*, *Annual Report 2006*, NSSE Institute, Indiana University, Bloomington, http://nsse.iub.edu/html/annual_reports.cfm

Oblinger, Diana, "Boomers, Gen-Xers & Millennials, Understanding the New Students," *Educause Review*, July/August 2003, Educause, pp 37-47.

Oblinger, Diana G. and James L. Oblinger, Editors, *Educating the Net Generation*, Educause, 2005, http://www.educause.edu/EducatingtheNetGeneration/5989

Oblinger, Diana G., editor, *Learning Spaces*, Educause, 2006, http://www.educause.edu/learningspaces

Olson, Florence, "U. of Michigan Cancels the Closely Watched Portal Project," *Information Technology*, The Chronicle of Higher Education, from the issue dated April 11, 2002, http://chronicle.com/free/2002/04/2002041101t.htm

Padilla, Genaro, and Carolyn Porter, Co-Chairs, *Commission on Undergraduate Education, Final Report*, University of California, Berkeley, September 2000, http://learning.berkeley.edu/cue/

Padilla, Je Nell, and Jerlena Griffin-Desta, *Living/Learning Survey 2002-2006*, Office of Student Development, Residential and Student Service Programs, Division of Student Affairs, University Of California, Berkeley (final report pending)

Palfrey, John, of the National Law Journal, "What's Technology's Role in Law School?," *Law.com Legal Technology*, November 16, 2006, http://www.law.com/jsp/legaltechnology/pubArticleLTN.jsp?id=1163585123651

Pluck, Sarah, *DoIT, 2005-06 UW-Madison Faculty/Staff Computer Survey*, *Data Report & Analysis*, University of Wisconsin Survey Center, University of Wisconsin, Madison, April 21, 2006, http://www.doit.wisc.edu/about/research/2006/2006_facStaff_DoITReport.pdf

Prensky, Marc, "Digital Natives, Digital Immigrants," *On the Horizon*, NCB University Press, Vol. 9 No. 5, October 2001

Radwin, David, *Undergraduates & Technology Fact Sheet 2006*, Office of Student Research, Division of Student Affairs, University of California, Berkeley, https://osr2.berkeley.edu/Public/STAFFWEB/DR/Technology_Fact_Sheet.pdf

Salaway, Gail, Richard N. Katz, and Judith B. Caruso, with Robert B. Kvavik and Mark R. Nelson, *ECAR Study of Undergraduate Students and Information Technology, 2006*, Educause Center for Applied Research (ECAR), Vol. 7, 2006, Educause, December 22, 2006, http://www.educause.edu/LibraryDetailPage/666?ID=ERS0607

Schrager, Cynthia D., in preparation for the upcoming biannual Symposium on Teaching, Learning, and Technology, "Points of Convergence: Faculty, Student, and GSI Focus Group Findings," "Summary of GSI Focus Group," "Summary of Faculty Focus Groups," and "Summary of Student Focus Groups," unpublished materials, Division of Undergraduate Education, University of California, Berkeley, October 31, 2006

Student Affairs, *Statement of Intent to Register Tech Survey*, University of California, Division of Student Affairs, University of California, Berkeley, 2005 and 2006, done annually

Sui, Judi, *First Year Student Survey*, Graduate Division, University of California, Berkeley, done annually

Thomson, Gregg, et al., *Survey of New Students*, Office of Student Research, Division of Student Affairs, University of California, Berkeley, done annually

UC Berkeley News, "Student Facts at a Glance, Fall semester 2006," *UC Berkeley Web Feature*, UC Berkeley News, August 23, 2006, http://www.berkeley.edu/news/media/releases/2006/08/23_facts.shtml

Undergraduate Affairs, *First Year Experience Task Force, Report*, Undergraduate Affairs, University of California, Berkeley, February 1999, http://students.berkeley.edu/uga/firstyear.htm

Waggener, Shelton, "Stepping up and Embracing Change," *iNews from the Chief Information Officer*, UC Berkeley information technology news channels, the Regents of the University of California, February 13, 2006, http://istpub.berkeley.edu:4201/bcc/Spring2006/875.html

——, as lead of planning process and chair of the Campus Technology Council, "Critical issue 2: Student experience, prospects through alumni," *Campuswide Information Technology Strategic Plan*, Technology@Berkeley, Regents of the University of California, http://technology.berkeley.edu/planning/strategic/critical2.html

Wahl, Kenneth R., *OSR's Questionnaire Development System,* Office of Student Research, Division of Student Affairs, University of California, Berkeley

Wallis, Claudia, and Sonja Steptoe, "How to Bring Our Schools Out of the 20th Century," *Time*, December 18, 2006, pp 50-56

Walton, Alexander, "Project Management Planning Workbook, v6.3 – Draft," September 18, 2006.

Wheeler, Brad, *Open Source Student Services System*, on behalf of the Executive Advisory Committee, Indiana University, Bloomington, July 31, 2006

Young, Jeffrey R., "'Open Courseware' Idea Spreads, MIT's plan to give away course materials online gains a few adherents," *Information Technology*, Volume 51, Issue 26, The Chronicle of Higher Education, from the issue dated March 4, 2005, http://chronicle.com/weekly/v51/i26/26a03201.htm

——, "George Washington University, Better Technology and High Schools Raises Students' Expectations," *Information Technology*, Volume 53, Issue 5, The Chronicle of Higher Education, from the issue dated September 22, 2006, http://chronicle.com/weekly/v53/i05/05a03101.htm

Zinko, Carolyne, "Why tlk whn u cn txt? Many raised in era of e-mail and texting shun conversation," *San Francisco Chronicle*, September 22, 2006, accessed through sfgate.com, http://www.sfgate.com/cgi-bin/article.cgi?file=/c/a/2006/09/22/MNGMTLANK71.DTL

# Appendixes

**Appendix A. Undergraduate Information Technology Survey and Results**

*Below is the undergraduate student survey written specifically for this project. This survey ran November 30–December 15, 2006. The survey introduction and all questions are shown, along with the counts and percentages for each response. Free-text responses are excluded in the interest of space. This survey had 156 responses (15.6% response rate).*

# UC Berkeley First-Year IT Experience Survey

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This survey takes about 10–15 minutes to complete. Your answers will remain confidential, so we appreciate your candor. You may skip any questions you prefer not to answer.

Note: For the purposes of this survey, "information technology" (IT) is the hardware and software used for the digital exchange of information. IT includes all the tools we use to go online and exchange text, voice, music, images and video. Cal-specific examples include AirBears, CalMail, and the online Schedule of Classes.

Thank you for helping us learn how we can improve the student IT experience at Cal!

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1A. Why did you choose to attend Cal? Please check all that apply.

141 (90.4%) Academic reputation
55 (35.3%) Cost
8 (5.1%) Family tradition
13 (8.3%) Friends attend
96 (61.5%) Location
73 (46.8%) Program in field of interest
16 (10.3%) Other, please specify: [Open-ended text field]

---

1B. When you were deciding which college(s) to apply to and attend, how important was the type and quality of the IT offered at each of your choices?

[2 missing] (Select one)
21 (13.6%) Very important
36 (23.4%) Important
50 (32.5%) Somewhat important
30 (19.5%) Not at all important
17 (11.0%) Don't know

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1C. How important is the quality of IT to your current overall satisfaction as a student at Cal?

[3 missing] (Select one)
44 (28.8%) Very important
65 (42.5%) Important
35 (22.9%) Somewhat important
1 (0.7%) Not at all important
8 (5.2%) Don't know

---

2. Which of the following best describes you? Please mark one.

16 (10.4%) I love new technologies and am among the first to use them
51 (33.1%) I like new technologies and use them before most people I know
69 (44.8%) I usually use new technologies when most people I know do
8 (5.2%) I am usually one of the last people I know to use new technologies
10 (6.5%) I am not interested in new technologies and use them only when I have to

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3. The UC Berkeley website (www.berkeley.edu) is the door to our campus for anyone interested in Cal, including students, visitors, researchers, faculty, alumni, staff, and people from other campuses. For some it is their first view of the campus. As a new student at Cal, please rate the following based on your impressions of the UC Berkeley website. Please mark one in each row.

| | Excellent | Good | Neutral | Poor | Don't Know |
|---|---|---|---|---|---|
| Overall Visual Appearance | 32 (20.8%) | 79 (51.3%) | 32 (20.8%) | 10 (6.5%) | 1 (0.6%) |
| Search Capabilities | 33 (21.6%) | 79 (51.6%) | 26 (17.0%) | 11 (7.2%) | 4 (2.6%) |
| Ease of Use | 28 (18.3%) | 76 (49.7%) | 35 (22.9%) | 14 (9.2%) | - |
| Overall Accuracy of Information | 37 (24.0%) | 90 (58.4%) | 19 (12.3%) | 1 (0.6%) | 7 (4.5%) |
| NewsCenter Information | 16 (10.5%) | 51 (33.3%) | 23 (15.0%) | 5 (3.3%) | 58 (37.9%) |
| Cal Student Connection | 19 (12.4%) | 51 (33.3%) | 23 (15.0%) | 9 (5.9%) | 51 (33.3%) |
| Online Tour | 24 (15.8%) | 39 (25.7%) | 29 (19.1%) | 7 (4.6%) | 53 (34.9%) |
| Information for Prospective Students | 38 (24.7%) | 74 (48.1%) | 27 (17.5%) | 9 (5.8%) | 6 (3.9%) |
| Information for Current Students | 40 (26.0%) | 81 (52.6%) | 14 (9.1%) | 10 (6.5%) | 9 (5.8%) |

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4. Are you able to easily navigate all the different university websites/web applications to accomplish your goals as a student? Please mark one in each row.

| | Yes | Somewhat | No | Don't know/Not applicable |
|---|---|---|---|---|
| Register for school | 117 (76.0%) | 31 (20.1%) | 6 (3.9%) | - |
| Select a class schedule | 113 (73.4%) | 33 (21.4%) | 8 (5.2%) | - |
| Learn about university, college, and major requirements | 76 (49.4%) | 61 (39.6%) | 17 (11.0%) | - |
| Manage my financial aid | 56 (36.8%) | 51 (33.6%) | 19 (12.5%) | 26 (17.1%) |
| Pay my CARS bill | 84 (55.3%) | 45 (29.6%) | 16 (10.5%) | 7 (4.6%) |
| Get a job while a student | 25 (16.4%) | 30 (19.7%) | 22 (14.5%) | 75 (49.3%) |
| Prepare for graduate school or employment after graduation | 19 (12.4%) | 33 (21.6%) | 15 (9.8%) | 86 (56.2%) |
| Pursue sports, hobbies, and interests | 39 (25.3%) | 54 (35.1%) | 21 (13.6%) | 40 (26.0%) |
| Other, please specify : [Open-ended text field] | 3 (7.5%) | 2 (5.0%) | 6 (15.0%) | 29 (72.5%) |

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5. Do you feel any of the following are preventing you from easily accessing IT resources at Cal? Check all that apply.

3 (1.9%) I do not own a computer
12 (7.7%) I do not own a laptop
4 (2.6%) I do not have an internet connection where I live
14 (9.0%) My computer equipment or internet connection is not adequate
15 (9.6%) Other, please specify: [Open-ended text field]

---

6A. While at Cal have you ever requested technical help from a university or departmental service or help desk/help line?

[3 missing] (Select one)
40 (26.1%) Yes
104 (68.0%) No
9 (5.9%) Don’t Know

---

6B. If yes, from where have you requested technical help?

| | Have you gotten the help you needed to solve your problem(s)? | |
|---|---|---|
| Please specify location: [Open-ended text field] | Yes | *** |
| | Somewhat | *** |
| | No | *** |
| Please specify location: [Open-ended text field] | Yes | *** |
| | Somewhat | *** |
| | No | *** |
| Please specify location: [Open-ended text field] | Yes | *** |
| | Somewhat | *** |
| | No | *** |

*** Results for 6B were based on the locations entered in the open-ended text fields.

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7A. How do you access your UC Berkeley email (@berkeley.edu)? Please check all that apply.
12 (7.7%) I open a program installed on my computer (e.g. Eudora, Mail, Outlook)
135 (86.5%) I go online and log on to CalMail
17 (10.9%) I forward my UC Berkeley email to another address
3 (1.9%) I do not use my UC Berkeley email
1 (0.6%) Other, please specify:

---

7B. How satisfied are you with UC Berkeley email in general?

[2 missing] (Select one)
50 (32.5%) Very satisfied
61 (39.6%) Somewhat satisfied
19 (12.3%) Neutral
20 (13.0%) Somewhat dissatisfied
4 (2.6%) Very dissatisfied

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7C. Which of the following would increase your satisfaction with or persuade you to use UC Berkeley email services? Please check all that apply.

39 (25.0%) Better spam blocking
74 (47.4%) Enhanced CalMail user interface
62 (39.7%) More disk space
31 (19.9%) More reliable sending and receiving of messages
22 (14.1%) Faster message delivery
23 (14.7%) Don't know
2 (1.3%) I won't use UC Berkeley email services
22 (14.1%) Other, please specify: [Open-ended text field]

8A. Are you satisfied with the existing process for selecting your class schedule? Please mark one.
[4 missing] (Select one)
31 (20.4%) Very satisfied
81 (53.3%) Somewhat satisfied
16 (10.5%) Neutral
19 (12.5%) Somewhat dissatisfied
5 (3.3%) Very dissatisfied

8B. Several online tools or sources of information exist for selecting the courses you wish to take. Which of the following do you use? Please check all that apply.

81 (51.9%) General Catalog (www.berkeley.edu/catalog)
149 (95.5%) Schedule of Classes (schedule.berkeley.edu)
36 (23.1%) CourseWeb (courseweb.berkeley.edu)
49 (31.4%) Undergraduate Advising College of Letters and Sciences (ls-advise.berkeley.edu/)
71 (45.5%) Departmental website(s)
34 (21.8%) Aman's Interface to Berkeley's Online Schedule (www.ocf.berkeley.edu/~amanb/makeSched)
18 (11.5%) Final Distance Perfect Schedule Generator (finaldistance.berkeley.edu)
6 (3.8%) Other, please specify: [Open-ended text field]

8C. Would having access to any of the following currently unavailable resources increase your satisfaction with selecting your class schedule online? Please check all that apply.

129 (82.7%) A syllabus posted online for every course
108 (69.2%) Sample schedules of students in my year with my intended major
109 (69.9%) More information on major requirements and prerequisites
78 (50.0%) Frequently asked questions related to scheduling
46 (29.5%) A glossary of scheduling terms
52 (33.3%) Increased office hours when I can visit, call or IM a live person
9 (5.8%) Other, please specify: [Open-ended text field]

9. Online collaborative tools, such as bSpace wikis or discussion forums, can allow students to discuss or share information on an academic topic online.

| | Yes | Somewhat | No |
|---|---|---|---|
| Have you used a collaborative online tool for classwork at Cal? | 73 (47.7%) | 19 (12.4%) | 61 (39.9%) |
| Would you value having more online collaborative tools available for future classes? | 79 (53.0%) | 44 (29.5%) | 26 (17.4%) |

10. Many students at Cal use computer centers. These centers are located in several places and are run by different organizations. The following question asks about the computer centers you have used, whether you plan to use them again, and whether you feel satisfied with them.

| | Have you ever used this type of computer center? | | Do you plan to use this type of computer center again? | | | Are you satisfied with this type of computer center? | | |
|---|---|---|---|---|---|---|---|---|
| | Yes | No | Yes | Maybe | No | Yes | Somewhat | No |
| An Academic Service Center located in a residential hall. (Actual locations are Unit 1, Unit 2, Unit 3, Unit 4, Unit 5, and University Village Apartments.) | 71 (46.7%) | 81 (53.3%) | 52 (41.6%) | 35 (28.0%) | 38 (30.4%) | 53 (50.5%) | 36 (34.3%) | 16 (15.2%) |
| A Workstation and Microcomputer Facility located on campus. (Actual locations are First Floor Moffitt Library, B3 Dwinelle Hall, B3 Evans Hall, 2105 Valley Life Sciences Building, 175 Tan Hall, and 211 Wheeler Hall) | 80 (53.3%) | 70 (46.7%) | 64 (48.5%) | 43 (32.6%) | 25 (18.9%) | 51 (43.2%) | 45 (38.1%) | 22 (18.6%) |
| The Open Computing Facility, located in Heller Lounge, King Student Union | 12 (8.2%) | 135 (91.8%) | 9 (9.1%) | 52 (52.5%) | 38 (38.4%) | 6 (7.9%) | 39 (51.3%) | 31 (40.8%) |
| Another computer center, please specify [Open-ended text field] | 11 (35.5%) | 20 (64.5%) | 10 (45.5%) | 6 (27.3%) | 6 (27.3%) | 5 (25.0%) | 8 (40.0%) | 7 (35.0%) |

11. How else could UC Berkeley use IT to enhance the student experience? (optional)
*[Open-ended text field]*

- a link on the berkeley website of computer access places. most students only resort to the student center (by the student store) or libraries. i did not know we had more. and computers with microsoft word applications. in some libraries, only some computers have it.
- Berkeley MUST get wireless internet in the dorms. Extend AirBears to our dorms. I am an out-of-state student, so obviously for the tuition I pay I feel we should have better services, but I understand that it is a public school and Berkeley doesn't accumulate as much funding as other private institutions. Regardless though, using Berkeley's academic reputation and our top engineering school in the nation, we should at least have those services.
- Better eMail!
- By being able to register for classes & view the schedule from bearfacts. It would be great to be able to check off the classes desired straight from a schedule available on the bearfacts site. Also, to have email capabilities from there. It would be fantastic to have all features in one place, i.e. bearfacts.
- Change back to old calmail
- change the scheduling system
- create ONE central website that connects every other site related to school- a portal that includes everything. Right now, I have half-a-dozen portal sites I have to bookmark and/or memorize. I have friends that go to other schools, and they only have to remember one web address to access everything from financial aid, to registering for classes, to the library. Also, AirBears is quite spotty in some buildings. Perhaps strengthening the network would be a good way to enhance our IT experience.

- Create three phases for signing up for classes. The first one would be like normal, the second one would be 13 units then the third one would be as much as you want.
- have a short seminar related to finding those IT resources available on campus and how to use them..
- i am unable to access airbears. i tried to follow the instructions to make sure i had all the necessary elements. however, the instructions are almost impossible for me to follow. airbears needs to be more accessible to all students, with instructions for people who know nothing about a computer.
- I don't know
- I don't know, but I am really confusing because there are many websites and a lot of information which is confusing me this is why I am always asking some student or worker around the campus. I still don't know how to use anything in the campus belong to technology
- I think Question 8C is where Berkeley should focus most of its efforts. It seems like adding these features to the IT services would really enhance students' abilities to make informed decisions and ultimately get the most out of their education.
- I think that the e-mail can be more aesthetically pleasing. Also, upgrading points of interest in the main website and advertising this on the front page may draw attraction to the pages that have the most important information.
- Improve Airbears on campus and expand it to the dorms
- Improvements will make finding info quick; and not take as much time as it does (it takes as much as finding research for a term paper).
- Improving bspace features and appearances.
- in the library in Moffitt (third floor computers), Microsoft word is not available. I need Microsoft Word many times to copy the information I find. Also, printing is pretty expensive. Thank you.
- It should be fine as it is, but it would be great if I won that 50 dollars.
- It would be nice if when a quarter of a Unit 1 building doesn't have the internet, someone actually listened to our complaints any time soon. It took almost a week to get internet because no one believed it wasn't working.
- I've been satisfied.
- maybe make a list of links of important websites for new students or give step by step instructions on a suggest route (by order of importance) of websites a new student needs to visit
- More computer labs
- More disc space on calmail. More posting on bSpace by professors. More information about a course on the schedule of classes. Easier access to major requirements. More explanation of the CARS system.
- More online/ipod lectures.
- more wireless!
- not too sure. maybe have a live internet support 24 hours for questions or emergencies.
- Nothing, its great
- online broadcast of workshops

- online tutorials with a video stream “how to” session for students who need IT assistance or general help with operating a computer. Many students know the basics involved with operating a system, but could use the assistance for topics that they may be too shy or embarrassed to ask about. An accessible site that allows someone to anonymously ask questions or watch a video would be helpful and convenient.
- Open wireless without signing in each and every time
- Please provide the type of computing facility of First Floor Moffitt EVERYWHERE on the campus. Sometimes I'm in another building in campus (for example: Doe, or Chem Library) and the building does not have a computer equipped with printing station, or with CD-ROM, I have to go to Moffitt, it's a waste of time. Please expand the computing facility everywhere on campus; that would be a very big help. Thank you.
- Provide free printing at the computer centers and free copying. Provide free laptops that students can borrow or checkout for a certain amount of time when student's computer (desktop or laptop) is broken. In general, provide more technologies that can be borrowed or checked out by students.
- Some computer centers are responsive and helpful (Unit computer centers) while others are not helpful and are reluctant to assist you (MLK). The staff that replies to emails on calmail needs to be expanded because I have sent 3-4 emails to them with zero responses.
- Telebears is a pain for any student. For the most part I haven't been able to get into classes that I need to graduate, which is a real pain.
- the computer centers that are available on campus are usually taken up so if there were more computers available, that would be good.
- The email interface needs some serious work. Frames?? Please. And not only that, there aren't any cookies to keep me logged in every time, so I have to sign in every time I click on the link in my toolbar folder... very annoying. Finally, it would be nice if we didn't have to enter our password every single time for school pages. Banks don't even do that. Just keep everything nice and neat in one place instead of having many different pages scattered all over the place. This is Berkeley, for crying out loud, where BSD was born. Finally, if you used open-source software, you could save so much money and students like me would be happier.
- The interface to the available courses in a semester is not adequate. Tools like Final Distance and Aman’s Interface are necessary because they provide graphical management tools. Such tools are the only way to effectively manage conflicting courses, major, requirements, scheduling concerns, and course availability. UC Berkeley itself, as a matter of course, should offer such an interface.
- The reason I filled out this survey is because I have repeatedly had problems logging in w/ my calnet ID. Some pages allow me to access it, some don't. I am a new student, and frequently use my “myBerkeleyapplication” page to then direct me to a page I know will allow me to access Calnet. Anyways, maybe someone else has that problem.
- to be able to download lectures for clarity
- UC Berkeley could improve overall design of the site so the students can navigate through the site easier.

## Appendix B. Graduate Student Information Technology Survey and Results (#1 of 2)

*Below is the first of two graduate student surveys conducted during this project. This survey ran November 9–18, 2006, and was based on questions on the University of California Undergraduate Experience Survey (UCUES). This survey had 129 responses.*

| **1. During this academic year, how often have you engaged in the following activities?** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Almost every waking hour | Several times a day | Once or twice a day | 3-5 days a week | 1-2 days a week | Every few weeks | Once or twice | Never |
| Used the Internet from a computer or other electronic device | 59 (46%) | 67 (52%) | 3 (2%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) |
| Used a cell (mobile) phone | 12 (9%) | 66 (51%) | 31 (24%) | 7 (5%) | 3 (2%) | 0 (0%) | 2 (2%) | 8 (6%) |
| Communicated with a professor by email | 4 (3%) | 13 (10%) | 12 (9%) | 24 (19%) | 28 (22%) | 36 (28%) | 11 (9%) | 1 (1%) |
| Communicated with a professor by instant messaging (IM) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 2 (2%) | 1 (1%) | 126 (98%) |
| Communicated with a GSI by email | 3 (2%) | 2 (2%) | 5 (4%) | 7 (6%) | 17 (13%) | 23 (18%) | 21 (17%) | 49 (39%) |
| Communicated with a GSI by IM | 0 (0%) | 1 (1%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (1%) | 0 (0%) | 125 (98%) |
| Communicated with other students about class assignments by email | 7 (5%) | 17 (13%) | 17 (13%) | 27 (21%) | 28 (22%) | 20 (16%) | 5 (4%) | 8 (6%) |
| Communicated with other students about class assignments by IM | 1 (1%) | 5 (4%) | 5 (4%) | 6 (5%) | 5 (4%) | 12 (9%) | 6 (5%) | 89 (69%) |
| Communicated with your parents by email | 1 (1%) | 2 (2%) | 11 (9%) | 17 (13%) | 23 (18%) | 44 (34%) | 12 (9%) | 19 (15%) |
| Communicated with your friends by email | 7 (5%) | 32 (25%) | 30 (23%) | 24 (19%) | 19 (15%) | 15 (12%) | 2 (2%) | 0 (0%) |

| **2. During this academic year, have you done any of the following?** | | |
|---|---|---|
| | Yes | No |
| Created art, photos, music or video using a computer | 78 (60%) | 51 (40%) |
| Shared your own art, photos, music, or video on the Internet | 83 (64%) | 46 (36%) |
| Searched for personal information about another student using a search engine (such as Google) | 83 (64%) | 46 (36%) |
| Advertised or invited other students to an event or meeting | 76 (59%) | 53 (41%) |
| Searched for personal information about another student using a social networking site (such as Facebook or MySpace) | 72 (56%) | 57 (44%) |

| **3. During this academic year, how frequently have you done each of the following?** | | | | | | |
|---|---|---|---|---|---|---|
| | Very often | Often | Somewhat often | Occa-sionally | Rarely | Never |
| Used a library catalog such as Pathfinder or Melvyl | 19 (15%) | 29 (22%) | 16 (12%) | 25 (19%) | 13 (10%) | 27 (21%) |
| Searched a library-provided database for journal articles | 30 (24%) | 24 (19%) | 19 (15%) | 17 (13%) | 12 (9%) | 25 (20%) |
| Used a non-library search engine (such as Google) for research | 59 (46%) | 37 (29%) | 18 (14%) | 8 (6%) | 3 (2%) | 4 (3%) |
| Read or printed e-books or online full-text journal articles | 40 (31%) | 37 (29%) | 19 (15%) | 13 (10%) | 7 (5%) | 13 (10%) |
| Brought your own laptop to the library and used a wireless connection | 39 (31%) | 15 (12%) | 9 (7%) | 12 (9%) | 13 (10%) | 39 (31%) |

| **4. Which of these best represents your opinion on the following statements?** | | | | | |
|---|---|---|---|---|---|
| | Strongly agree | Agree | Disagree | Strongly disagree | Don't know |
| I would like more professors to use Powerpoint slides in their lectures | 14 (11%) | 39 (30%) | 36 (28%) | 28 (22%) | 12 (9%) |
| The Internet has helped me better communicate with my instructors | 51 (40%) | 64 (50%) | 6 (5%) | 3 (2%) | 5 (4%) |
| The Internet has helped me better communicate with my classmates | 67 (52%) | 51 (40%) | 6 (5%) | 2 (2%) | 3 (2%) |
| The Internet has made it more difficult to complete assignments | 5 (4%) | 9 (7%) | 43 (33%) | 69 (53%) | 3 (2%) |
| I am more comfortable asking questions of my instructors in office hours rather than by email or instant messaging | 10 (8%) | 29 (22%) | 59 (46%) | 22 (17%) | 9 (7%) |
| I would prefer to buy printed course packets/readers instead of downloading readings from the Internet | 25 (20%) | 29 (23%) | 32 (25%) | 34 (27%) | 8 (6%) |
| Sometimes the use of information technology in the classroom makes it harder to do well in my classes | 5 (4%) | 14 (11%) | 60 (47%) | 37 (29%) | 12 (9%) |
| I prefer to do research on the Internet when possible rather than go to the library | 52 (40%) | 53 (41%) | 15 (12%) | 6 (5%) | 3 (2%) |

| **5. Would you like to be able to download a greater number of your class lectures in the form of podcasts (audio) or webcasts (video)?** | |
|---|---|
| Yes | 79 (62%) |
| No | 49 (38%) |
| Total | 128 (100%) |

*Additional Comments.*

- Although I am sure this would reduce class participation, it really helps when studying for exams.
- audio, no  video, yes
- I think there is something to be said for going to class and having the ability to ask questions
- but i would need to know how to use these since i am not familiar with the technology
- Though, if I really felt that strongly about it, I probably could record them myself.
- Currently, only undergraduate general education type classes are webcasted.  I would love to have graduate classes on webcast.
- Absolutely--in fact, I often “spy” on other classes because I find their lectures so interesting.
- i don’t have classes that are lectures.
- YES to Podcasts!!YES YES to webcasts!!!
- Yes because currently nothing is taped and its hard to recollect some of things professors said even if I go back to them at a later point
- Webcasts are not and should not be substitutes for live classes. However, they are a great resource for double-checking notes and reviewing material for exams.
- I do not have time to listen into podcasts and webcasts. I prefer written material that I can slice and dice the way I like it.( podcasts and webcasts are not searchable for content which is very important for me)
- I attend class lectures regularly, I think this would facilitate people skipping class more often.
- Podcast / webcast initially seem useful, but who has got time to sit and listen to the lecture yet again!!  Instead, I prefer to listen carefully during the actual lecture.
- And it would be best if we could download them as files rather than streaming so we can watch when offline.
- I think in most classes this would lead to less attendance, which could result in less interaction, lower "morale," and boredom.  However, if I had to miss a class for sickness or the like, I would much much much rather have the real thing than someone el
- The Berkeley-Columbia EMBA program classes have densely packed lectures. It is impossible to grok all the material during the lecture. Podcasts would be invaluable for review and study.
- All classes should be taped and made available for at least a year after we have taken the class. Digital formats are cheap and easy to transport.

| **6. Why did you answer "Yes" or "No" to question #5? (please check all that apply)** | |
|---|---|
| I would like more professors to use Powerpoint slides in their lectures | 24 (20%) |
| The Internet has helped me better communicate with my instructors | 24 (20%) |
| It saves me time | 41 (33%) |
| It is as if I can choose what time I want to go to lecture | 26 (21%) |
| I like to review my notes while replaying the lecture | 62 (50%) |
| I am not a native English speaker and it helps to be able to review the lecture | 10 (8%) |
| I can use it in case I miss lecture | 60 (49%) |
| I am not interested in podcasts or webcasts | 40 (33%) |
| Enough of my professors provide lectures in the form of podcasts or webcasts now | 2 (2%) |
| Other, please specify | 17 (14%) |

*Responses to "other" from those who answered, "yes."*

- I take some wicked hard classes, I'd like to review
- You can pause or replay a podcast, but not a prof
- I just think it'd be nice to have the option.
- Helps for reviewing for exams and course wrap-up
- Allows one to hear lectures in other disciplines
- you can explore other subjects in your own time!
- I could share the lectures with other people
- Would be a nice option.

*Responses to "other" from those who answered, "no."*

- I'm a grad student in small seminars
- I am a grad student and all my classes are small
- Fewer people show up to class.
- I don't have classes that are lectures.
- Notes are faster to review because we write them
- Types of classes I have aren't appropriate for pod
- A good lecture is at least a little interactive.
- I am already frustrated with over-reliance on P.P.
- MBA is all about learning from colleagues in class

| **7. Which of the following best describes you?** | |
|---|---|
| I love new technologies and am among the first to experiment with them and use them | 17 (13%) |
| I like new technologies and use them before most people I know | 46 (36%) |
| I usually use new technologies when most people I know do | 56 (43%) |
| I am usually one of the last people I know to use new technologies | 8 (6%) |
| I am skeptical of new technologies and use them only when I have to | 2 (2%) |
| Total | 129 (100%) |

8. How could UC Berkeley use information technology to enhance the student experience? *[Free-text field]*

- A more reliable Airbears network, with expanded coverage into older buildings, would help greatly.
- Better e-mail system (more reliable), standard IM, better video streaming quality.
- Better online registration and course catalog information; more consistent availability of course materials online (bSpace is kind of a pain)
- By developing an email system which doesn't lock when I receive a 60 MB email of readings from a professor and have to forward it to yahoo because it doesn't open (and the forwarded email occupies space in the “sent” folder, making the account to collapse).
- Create a portal for student information systems.
- Difficult question.
- Ensure that quality of education does not get compromised. we did not have a good prof for one of the classes. Things like that affect what we get out of classes.
- Greater wireless access range.
- Higher bandwidth wireless networks (802.11g) and better wireless coverage.
- I think is a good idea to make online as much as you can of the class materials.
- I think there is almost too much reliance on powerpoint, which allows professors to go too fast or cram too much information into them without allowing enough time for notetaking. So podcasts are nice in that context.
- Improve wireless reception on and around campus; provide a faster connection
- Increase the areas around campus that Airbears can be accessed for wireless computing.
- It's good the only bad thing is cellular connection
- Make a better library cataloguing system!!! Find some way to bring all three existing systems onto a single, less complicated system for books, articles etc.
- Make airbears available on upper floors and more widely throughout campus! Install GOOD projectors everywhere! Videotape and make available to students ALL lectures (please?)

- maybe I am not aware of many computer labs but from what I can tell so far, there are not enough computers and/or they just suck. It seems UCB believes everyone can afford a laptop! Last I checked, this is a public school that is supposed to have people from all types of income levels present. This is my 8th year in college, first year PhD student here at UCB. I have been to 2 different top public schools (one for undergrad, one for Masters), both seem to do a much better job in this area than UCB. UCB wins when it comes to wireless though. Airbears is good.
- More bandwidth on Airbears
- More course websites, more podcasts
- more online/podcast/webcast lectures available to students.
- more webcasts and podcasts! It helps to be able to replay the lectures to understand the material better. It also helps to see them if we can't make it to class. And it's also great to “sit in” on courses who's topic we have an interest in but may be outside of our degree program.
- Off-campus AirBears!
- Offer free printing services to graduate students.
- Offer it to more students -- build more computer labs.
- Online lecture notes and research material; video and audio podcasts of classes.
- Professors need training in how to make powerpoint presentations. The blackboard seems to have forced them to slow down and teach properly. Powerpoint just lets them gloss over important details. They are not going through the derivations (that the blackboard forces) anymore. It is difficult to keep up with them in note taking.
- Provide a single system for Student information system. Currently the system appeared far too fragmented with redundant and confusing functions in various subsystems, e.g. catalyst has some information overlap with study.net, bear facts has information overlap with pay.net. It might be a good idea to tie all the systems and present an easy to understand interface with no redundancy.
- Provide more information about online archival resources of which students may not be aware.
- Provide more information on technological tools that could be of use to students. The Computing at Berkeley CD was excellent and very helpful.
- Remove the blind spots in the classrooms the Haas building. Also a lot of the ethernet plugs in the classroom at Haas don’t work.
- Rid us of the need to carry books!!! I love the idea of having online books, especially in law school where I feel my back is breaking! I also place a lot of value on the fact that fewer natural resources would be used, and also feel that it would ease space limitations.
- The basement of the business school library has really poor wireless connection. Need to add a powerful access point there. Also cell phone coverage in some of the parts of school building is really bad, I use my cell phone to check emails, I expect some of those things in a technologically advanced school to work.
- UC Berkeley should choose to go after a couple of new technologies and do that very well. Last discussion it sounded like UC Berkeley was going to implement 20 items and I'm not sure they have the infrastructure to support these initiatives.

**Appendix C. Graduate Student Information Technology Survey and Results (#2 of 2)**

*Below is the second of two graduate student surveys conducted during this project. This survey ran November 19-December 31, 2006. Questions were co-written by team members and Berkeley's Graduate Division staff as part of their annual survey. This survey had 323 responses.*

# Graduate Student Technology Survey, 2006

A. Online Social Networking Services

The following questions are about social networking services. Services like Facebook or MySpace are web-based social networking utilities that connect you with people. Users of social networking services can share information with people they know; see what's going on with their friends; or meet new people.

A1. Are you currently registered as a user of an online social networking service?

| | |
|---|---|
| 178 *(57.2%)* | Yes |
| 133 *(42.8%)* | No |

A2. Which services do you use? (check all that apply)

| | |
|---|---|
| 112 *(34.7%)* | None |
| 12 *(3.7%)* | Classmates |
| 110 *(34.1%)* | Facebook |
| 22 *(6.8%)* | Flickr |
| 47 *(14.6%)* | Friendster |
| 60 *(18.6%)* | MySpace |
| 34 *(10.5%)* | Other *(specify)* |

A3. Which of the following best describes how often you use a social networking service? (check only one)

| | |
|---|---|
| 115 *(37.7%)* | Never |
| 62 *(20.3%)* | Daily |
| 66 *(21.6%)* | Weekly |
| 31 *(10.2%)* | Monthly |
| 31 *(10.2%)* | Less than monthly |

A4. Would you be interested in subscribing to a UC Berkeley-run social networking service?

| | |
|---|---|
| 154 *(49.5%)* | Yes |
| 157 *(50.5%)* | No |

A5. What features would most interest you in a UC Berkeley-run social networking service? (check all that apply)

| | |
|---|---|
| 114 *(35.3%)* | Not interested in an online social networking service |
| 85 *(26.3%)* | Sharing photos with friends |
| 34 *(10.5%)* | Sharing video with friends |
| 61 *(18.9%)* | Posting comments to my friends' pages |
| 84 *(26.0%)* | Seeing my friends' personal interests |
| 90 *(27.9%)* | Seeing my friends' academic interests |
| 81 *(25.1%)* | Locating study partners |
| 99 *(30.7%)* | Making new friends |
| 100 *(31.0%)* | Organizing student groups |
| 107 *(33.1%)* | Announcing and/or organizing events |
| 11 *(3.4%* ) | Other *(specify)* |

A6. What reasons would keep you from using a UC Berkeley-run social networking service? (check all that apply)

| | |
|---|---|
| 106 *(32.8%)* | I don't like to use social networking services |
| 96 *(29.7%)* | Not all my friends attend UC Berkeley |
| 42 *(13.0%)* | I like to keep my school and social life separate |
| 81 *(25.1%)* | I'm concerned about privacy issues related to sharing my personal information online |
| 73 *(22.6%)* | I already use a networking service that meets all my needs |
| 19 *(5.9%)* | Other *(specify)* |

C. Information Technology Services

The following services are being considered by the UC Berkeley Information Systems Technology Department. Because there may not be enough resources to offer all of them, the campus needs to prioritize according to the needs of users.

C1. Please rate how important it is to you that UC Berkeley offer each of the following services:

| | | Very Important | Important | Somewhat Important | Not Important | N/A (Don't know) |
|---|---|---|---|---|---|---|
| a. | A university-wide event calendaring system | 123 *(41.4%)* | 90 *(30.3%)* | 50 *(16.8%)* | 22 *(7.4%)* | 12 *(4.0%)* |
| b. | Expanded video-conferencing | 44 *(14.9%)* | 55 *(18.6%)* | 64 *(21.7%)* | 84 *(28.5%)* | 48 *(16.3%)* |
| c. | Wireless access everywhere on campus | 235 *(78.6%)* | 44 *(14.7%)* | 14 *(4.7%)* | 2 *(0.7%)* | 4 *(1.3%)* |
| d. | Webcasting and podcasting tools | 74 *(25.1%)* | 62 *(21.0%)* | 72 *(24.4%)* | 61 *(20.7%)* | 26 *(8.8%)* |
| e. | Personal Web hosting | 53 *(18.0%)* | 77 *(26.2%)* | 68 *(23.1%)* | 70 *(23.8%)* | 26 *(8.8%)* |
| f. | Tools for turning research data into instructional content | 72 *(24.8%)* | 84 *(29.0%)* | 57 *(19.7%)* | 37 *(12.8%)* | 40 *(13.8%)* |
| g. | Improved remote access | 130 *(44.5%)* | 92 *(31.5%)* | 38 *(13.0%)* | 12 *(4.1%)* | 20 *(6.8%)* |
| h. | Collaboration software (wikis, file storage and sharing) | 104 *(35.4%)* | 99 *(33.7%)* | 50 *(17.0%)* | 17 *(5.8%)* | 24 *(8.2%)* |
| i. | Assistance with creating and maintaining websites, blogs | 42 *(14.3%)* | 73 *(24.8%)* | 81 *(27.6%)* | 74 *(25.2%)* | 24 *(8.2%)* |

| | | Very Important | Important | Somewhat Important | Not Important | N/A (Don't know) |
|---|---|---|---|---|---|---|
| j. | High-performance computing | 127 (*42.9%*) | 79 (*26.7%*) | 35 (*11.8%*) | 27 (*9.1%*) | 28 (*9.5%*) |
| k. | Virtualization services | 48 (*16.5%*) | 57 (*19.6%*) | 63 (*21.6%*) | 55 (*18.9%*) | 68 (*23.4%*) |
| l. | Instant messaging | 40 (*13.7%*) | 39 (*13.4%*) | 69 (*23.7%*) | 121 (*41.6%*) | 22 (*7.6%*) |
| m. | Improved spam blocking | 116 (*39.5%*) | 92 (*31.3%*) | 47 (*16.0%*) | 28 (*9.5%*) | 11 (*3.7%*) |
| n. | Other | 9 (*25.7%*) | | | 3 (*8.6%*) | 23 (*65.7%*) |

D3. Please use the following space if you have any other comments about technology service issues not addressed by this survey.
*[Free-text field]*

- A lack of adequate computing facilities is profoundly disturbing.
- AirBears is not available in Wurster Hall -- and yet students there have to pay for wifi access. I'm not an architecture student, but it seems punitive.
- An integrated, fully functional UC Berkeley calendar or set of calendars is key. License Google's APIs!
- Citation management software -- UCB should provide EndNote software free for all graduate students in PhD programs. The currently-provided RefWorks access is great and should be continued, but EndNote is needed to complement it so that students can take their references with them after graduation without having to pay an annual fee to RefWorks indefinitely. UCB should also offer free or modest-fee-based access to online library resources for alumni from professional schools, particularly public-service oriented schools like Social Welfare and Public Policy. At UCB students are taught that it's important to use research to inform practice, but then after graduation many of us go to work for nonprofits or public agencies that don't offer access to electronic resources like journal articles, which seriously limits the ability to find out about research to use for practice. If library access was included as a benefit of alumni association membership (or could be added for an additional fee), I think alumni would take advantage of the opportunity. Another thing UCB could do would be offer a program where public agencies and nonprofits could pay a subsidized or sliding-scale fee to purchase access to UCB online library resources for their organizations.
- Compared to other institutions I have been at, I think Cal is sadly lacking in the area of technology in the classrooms. Professor and GSI's have very limited access or no access to projectors. I am limited to a whiteboard and my drawing skills. That is technologically archaic.
- Connecting to AirBears wireless has been a huge pain. It works sporadically and my password has had to be reset several times. Plugging in always works, but it sucks to have to be near a plug and always carry a cable in case. Reliable wireless access everywhere PLEASE!!

- Engineering Library does not have a good quality internet everywhere on the Library, nor power connections.
- Have more places with public use computers WITH printers
- Help with Macintosh-related interfacing problems for B-space
- How can AirBears can be improved in times of high volume where lots of people are logged onto the network.
- I feel like I never know when the deadlines are for dropping/adding a class, grade change preferences, etc. If there was an e-mail that mentioned the grade and then pointed to a website where this stuff is located that would be nice. Also, some students have access to CalAgenda, maybe you could upload a calendar with these dates right into our current calendars.
- I find the haas computing center and remote login to be quite frustrating at times. The main problem is that we have a very limited amount of space and if we use too much we cannot logout. This in itself is problematic, but it becomes even worse since using certain programs on the computers causes files to be created automatically which use up all the space, preventing me from logging out. I have no way of preventing the creation of these files, and have no idea how to delete them (profile cleaner works sometimes, but not always).
- I just want to emphasize how much better the spam-blocking software for CalMail needs to be. I have set my filter to the lowest setting, but it has made no difference at all.
- I receive more spam on my berkeley account than any of the other three email accounts i use.
- It would be nice if you only had to login to the UCB system once for Bearfacts, Telebears, Airbears, etc. instead of repeatedly logging in. Also, I am disappointed with the library web technology. I would expect that the GLADIS system would be replaced with a web-based application. I would also expect that holds could be requested online.
- It's been tough to find lab space since the lab is shared with classes and the older computers have the usb port in the back so it is very difficult to insert my flash drive to work on hw at school (which is easier because school computers already have all the software). Also I need to know where to go to plug in my laptop and get internet and be able to talk without disrupting others (the library is not always the best for working in a group).
- NO
- Overall I've been disappointed in UCBs tech services - given that this is one of the nations premier tech institutions I would have expected better performing networks, access and computer labs - the UCB tech experience is a bit primitive overall.
- Provide Mac support
- See comment B5 - look at what UCLA has, and model off of that.
- Single sign-in that integrates study.net, catalyst, bearfacts, webmail, alumni ... you get the idea. ;-)
- The academic search engines, in particular Gladys, are very old and very user unfriendly. I have tried several times to learn it and it is very difficult. I suggest their could be a centralized location where you can search for on reserve books, journal articles etc. may I suggest you see the Scotty Library website of UC Riverside, they have just updated it. Their general website with the spotlight also looks nice.

- The Civil Engineering Computer Lab is the size and quality of a high school computer lab.
- The disjointed series of websites that ostensibly allows one to execute university business is almost impossible for me to navigate. I am a skilled computer user and have had no difficultly navigating similar sites at other universities, as well as transact business over the internet (banking, DMV, etc.) Any efforts to simplify/condense these sites would be greatly appreciated.
- The fact that the graduate lounges in education (Tolman 4, for example) need to have their technology updated and need to have someone who can come repair them.
- The library webpage could use some work. It seems like one shouldn't have to go through so much to simply bring up journal articles.
- The web version of Calmail is not good at all, and the amount of space allocated to it is very inadquate. I had to start forwarding mine to an outside account.
- The weekly bandwidth usage limit is way too low, I can't even watch online TV Channels as I please and I'm paying 16 dollars each month for subscription to those TV Channels. Internet is not about static downloads anymore, you know, it's all about streaming now.
- There need to be full graphics kits in the computer labs. Not just Photoshop, but InDesign, Quark, etc. that are accessible to all graduate students.
- What about security? This issue is very important to me and other students, but is not addressed on this survey.
- improved airbears coverage would be great. concentrate on the libraries, which seem to have the worst coverage.
- no
- none
- video cameras should be available for off-campus use.
- wireless internet access needs to be improved in Boalt -- quite often the signal indicates “low connectivity”

## Appendix D. UCUES Wildcard Module on Technology, Survey and Results

*The University of California Undergraduate Experience Survey (UCUES) is an online survey that UC undergraduates are invited to complete each spring. The survey is funded by the University of California and is based at the Center for Studies in Higher Education at UC Berkeley. It is administered by the UC Berkeley Office of Student Research. UCUES provides an opportunity for students to give the university feedback on many aspects of student life, such as the quality of the undergraduate experience, advising, access to classes, and their overall satisfaction with the UC experience. (Source: http://ucues.berkeley.edu/)*

*The following questions were included as a one-time "wildcard module" on technology for UC Berkeley students in the 2006 survey.*

### PART III: ITEMS OF SPECIAL INTEREST TO UC BERKELEY

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### Undergraduates and Technology

### Hardware

1. Which of the following devices do you own? Check all that apply.

796 (37.8%) Personal desktop computer
1577 (74.8%) Personal laptop computer
154 (7.3%) Personal digital assistant (PDA) such as Palm or PocketPC
40 (1.9%) Smart phone (combination cell phone and PDA), such as Treo
1826 (86.7%) Cell phone (mobile phone)
772 (36.6%) Working regular telephone (land line)
1280 (60.7%) Portable digital music player (such as iPod)
85 (4.0%) Portable electronic translation device
329 (15.6%) Webcam

2. Which of these best describes your personal desktop computer?

1053 (55.2%) Don't own [skip to the next item]
756 (39.6%) Generally adequate
76 (4.0%) Barely adequate
22 (1.2%) Not at all adequate

2a. What is the primary operating system on this computer?

1090 (81.0%) Windows
128 (9.5%) Macintosh
24 (1.8%) Linux
3 (0.2%) Other Unix
100 (7.4%) Other, please specify: [Open-ended text field]

3. Which of these best describes your personal laptop computer?

334 (17.4%) Don't own [skip to the next item]
1442 (74.9%) Generally adequate
125 (6.5%) Barely adequate
23 (1.2%) Not at all adequate

3a. What is the primary operating system on this computer?

1319 (81.1%) Windows
277 (17.0%) Macintosh
17 (1.0%) Linux
Other Unix
13 (0.8%) Other, please specify: [Open-ended text field]

3b. How often do you bring your laptop to class this semester?

768 (47.0%) Never
526 (32.2%) Sometimes
155 (9.5%) Often
185 (11.3%) Always or almost always

4. How do you most often connect your personal computer to the Internet at your local residence?

61 (3.1%) Dial-up modem to UC Berkeley (Home IP service, SHIPS)
36 (1.9%) Dial-up modem to other service provider (such as AOL, Earthlink, MSN)
59 (3.0%) Wireless connection to AirBears
379 (19.6%) Direct Ethernet connection
601 (31.0%) DSL (such as SBC/Yahoo! DSL)
510 (26.3%) Cable modem (such as Comcast)
146 (7.5%) Other high-speed Internet access (such as satellite dish) T-1 or fiber optic
34 (1.8%) Do not connect to Internet from home
49 (2.5%) Don't know
62 (3.2%) Other, please specify: [Open-ended text field]

5. How do you most often connect to the Internet while on campus?

894 (46.4%) Use a university computer (in a computer lab, library, etc.)
791 (41.0%) Use my own computer with wireless connection to AirBears
8 (0.4%) Use another electronic device (PDA, mobile phone, etc.)
205 (10.6%) Do not connect to Internet while on campus
30 (1.6%) Other, please specify: [Open-ended text field]

**Technology & The Student Experience**

6. During this academic year, how often have you engaged in the following activities?

| | Almost every waking hour | Several times a day | Once or twice a day | 3-5 days a week | 1-2 days a week | Every few weeks | Once or twice | Never |
|---|---|---|---|---|---|---|---|---|
| Used the Internet from a computer or other electronic device | 580 (*30.0%*) | 1076 (*55.7%*) | 162 (*8.4%*) | 48 (*2.5%*) | 23 (*1.2%*) | 12 (*0.6%*) | 18 (*0.9%*) | 13 (*0.7%*) |
| Used a cell (mobile) phone | 187 (*9.7%*) | 1075 (*55.6%*) | 445 (*23.0%*) | 100 (*5.2%*) | 45 (*2.3%*) | 21 (*1.1%*) | 24 (*1.2%*) | 35 (*1.8%*) |
| Communicated with a professor by email | 20 (*1.0%*) | 35 (*1.8%*) | 52 (*2.7%*) | 141 (*7.3%*) | 265 (*13.7%*) | 721 (*37.3%*) | 581 (*30.1%*) | 116 (*6.0%*) |
| Communicated with a professor by instant messaging (IM) | 14 (*0.7%*) | 16 (*0.8%*) | 11 (*0.6%*) | 19 (*1.0%*) | 15 (*0.8%*) | 24 (*1.2%*) | 26 (*1.3%*) | 1805 (*93.5%*) |
| Communicated with a GSI by email | 17 (*0.9%*) | 28 (*1.5%*) | 46 (*2.4%*) | 157 (*8.1%*) | 399 (*20.7%*) | 812 (*42.1%*) | 384 (*19.9%*) | 86 (*4.5%*) |
| Communicated with a GSI by IM | 11 (*0.6%*) | 12 (*0.6%*) | 10 (*0.5%*) | 21 (*1.1%*) | 23 (*1.2%*) | 47 (*2.5%*) | 63 (*3.3%*) | 1727 (*90.2%*) |
| Communicated with other students about class assignments by email | 19 (*1.0%*) | 68 (*3.5%*) | 95 (*4.9%*) | 231 (*12.0%*) | 448 (*23.3%*) | 588 (*30.5%*) | 327 (*17.0%*) | 149 (*7.7%*) |
| Communicated with other students about class assignments by IM | 38 (*2.0%*) | 111 (*5.7%*) | 126 (*6.5%*) | 199 (*10.3%*) | 282 (*14.6%*) | 257 (*13.3%*) | 244 (*12.6%*) | 676 (*35.0%*) |
| Communicated with your parents by email | 14 (*0.7%*) | 36 (*1.9%*) | 70 (*3.6%*) | 201 (*10.4%*) | 369 (*19.1%*) | 436 (*22.6%*) | 261 (*13.5%*) | 543 (*28.1%*) |
| Communicated with your friends by email | 47 (*2.4%*) | 167 (*8.6%*) | 198 (*10.2%*) | 345 (*17.8%*) | 437 (*22.6%*) | 402 (*20.8%*) | 210 (*10.9%*) | 127 (*6.6%*) |

7. During this academic year, have you done any of the following?

| | Yes | No |
|---|---|---|
| Created art, music or video using a computer | 764 *(39.6%)* | 1165 *(60.4%)* |
| Shared your own art, music, or video on the Internet | 615 *(31.9%)* | 1312 *(68.1%)* |
| Searched for personal information about another student using a search engine (such as Google) | 847 *(44.0%)* | 1076 *(56.0%)* |
| Advertised or invited other students to an event or meeting | 992 *(51.6%)* | 929 *(48.4%)* |
| Searched for personal information about another student using a social networking site (such as Facebook or MySpace) | 1573 *(81.7%)* | 352 *(18.3%)* |

8. During this academic year, how frequently have you done each of the following?

| | Never | Rarely | Occasion-ally | Some-what often | Often | Very often |
|---|---|---|---|---|---|---|
| Used a library catalog such as Pathfinder or Melvyl | 277 (*14.4%*) | 343 (*17.8%*) | 564 (*29.2%*) | 326 (*16.9%*) | 259 (*13.4%*) | 160 (*8.3%*) |
| Searched a library-provided database for journal articles | 323 (*16.8%*) | 377 (*19.6%*) | 530 (*27.5%*) | 287 (*14.9%*) | 251 (*13.0%*) | 156 (*8.1%*) |
| Used a non-library search engine (such as Google) for research | 54 (*2.8%*) | 143 (*7.5%*) | 325 (*17.0%*) | 392 (*20.4%*) | 457 (*23.8%*) | 546 (*28.5%*) |
| Read or printed e-books and online full-text journal articles | 367 (*19.1%*) | 395 (*20.5%*) | 417 (*21.7%*) | 307 (*16.0%*) | 284 (*14.8%*) | 154 (*8.0%*) |
| Brought your own laptop to the library and used a wireless connection | 764 (*39.7%*) | 272 (*14.1%*) | 300 (*15.6%*) | 196 (*10.2%*) | 198 (*10.3%*) | 195 (*10.1%*) |

9. Which of these best represents your opinion on the following statements?

| | Strongly disagree | Disagree | Agree | Strongly agree | Don't know |
|---|---|---|---|---|---|
| I would like more professors to use Powerpoint slides in their lectures | 238 (*12.3%*) | 508 (*26.3%*) | 643 (*33.3%*) | 356 (*18.4%*) | 185 (*9.6%*) |
| The Internet has helped me better communicate with my instructors | 33 (*1.7%*) | 179 (*9.3%*) | 966 (*50.2%*) | 663 (*34.5%*) | 83 (*4.3%*) |
| The Internet has helped me better communicate with my classmates | 25 (*1.3%*) | 118 (*6.1%*) | 833 (*43.2%*) | 899 (*46.7%*) | 52 (*2.7%*) |
| The Internet has made it more difficult to complete assignments | 537 (*27.9%*) | 875 (*45.5%*) | 321 (*16.7%*) | 114 (*5.9%*) | 76 (*4.0%*) |
| I am more comfortable asking questions of my instructors in office hours rather than by email or instant messaging | 150 (*7.8%*) | 855 (*44.4%*) | 518 (*26.9%*) | 229 (*11.9%*) | 173 (*9.0%*) |
| I would prefer to buy printed course packets/readers instead of downloading readings from the Internet | 387 (*20.1%*) | 544 (*28.2%*) | 494 (*25.6%*) | 379 (*19.7%*) | 124 (*6.4%*) |
| Sometimes the use of information technology in the classroom makes it harder to do well in my classes | 345 (*17.9%*) | 880 (*45.6%*) | 414 (*21.5%*) | 101 (*5.2%*) | 188 (*9.8%*) |
| I prefer to do research on the Internet when possible rather than go to the library | 57 (*3.0%*) | 278 (*14.5%*) | 762 (*39.7%*) | 718 (*37.4%*) | 105 (*5.5%*) |

10. Would you like to be able to download a greater number of my class lectures in the form of podcasts (audio) or webcasts (video)?

530 (27.5%) No (Skip to next item)
1399 (72.5%) Yes

10a. Why? Please check all that apply

762 (36.2%) It saves me time
786 (37.3%) It is as if I can choose what time I want to go to lecture
1024 (48.6%) I like to review my notes while replaying the lecture
115 (5.5%) I am not a native English speaker and it helps to be able to review the lecture
1224 (58.1%) I can use it in case I miss lecture

11. Which of the following best describes you?

207 (10.7%) I love new technologies and am among the first to experiment with them and use them
394 (20.5%) I like new technologies and use them before most people I know
974 (50.6%) I usually use new technologies when most people I know do
280 (14.5%) I am usually one of the last people I know to use new technologies
71 (3.7%) I am skeptical of new technologies and use them only when I have to

**Facebook**

This next section is all about the website Facebook.

12. How often do you use Facebook?

73 (3.8%) Almost every waking hour
351 (18.1%) Several times a day
449 (23.2%) Once or twice a day
264 (13.6%) 3-5 days a week
207 (10.7%) 1-2 days a week
156 (8.0%) Every few weeks
85 (4.4%) Once a month or less
80 (4.1%) Used it in the past but not now

Why did you stop? *[Open-ended text field]*

273 (14.1%) Never used it

Why not? *[Open-ended text field]*

(If you do not currently use Facebook, please skip to the end of the questionnaire.)

13. Generally speaking, how important is Facebook to you?

| | | | | | |
|---|---|---|---|---|---|
| 273 *(16.1%)* Not important | 481 *(28.4%)* Not very important | 548 *(32.4%)* Somewhat important | 244 *(14.4%)* Important | 88 *(5.2%)* Very important | 58 *(3.4%)* Essential |

Please explain: *[Open-ended text field]*

14. About what proportion of these students do you think use Facebook?

| | <25% | 25-50% | 51-75% | >75% |
|---|---|---|---|---|
| All Cal students | 28 (*1.7%*) | 188 (*11.1%*) | 716 (*42.3%*) | 762 (*45.0%*) |
| Closest male friends at Cal | 101 (*6.1%*) | 227 (*13.7%*) | 458 (*27.6%*) | 875 (*52.7%*) |
| Closest female friends at Cal | 53 (*3.2%*) | 137 (*8.2%*) | 404 (*24.3%*) | 1070 (*64.3%*) |
| Closest friends at other schools | 127 (*7.7%*) | 248 (*15.0%*) | 552 (*33.3%*) | 731 (*44.1%*) |

15. Which of these have you uploaded to Facebook?

1397 (66.3%) Photo of myself
834 (39.6%) Photos of friends. About how many?

Please type the number:
*[Open-ended text field]*

1460 (69.3%) My email address
1213 (57.6%) List of my current classes
1261 (59.8%) Lists of favorite music, movies, food, or similar things
962 (45.7%) Whether I am in a relationship

16. Including photos that other people may have uploaded, how many photos of you do you think are on Facebook? Please type the number:
*[Open-ended text field]*

17. Many students belong to groups on Facebook. What is one group to which you belong that is particularly significant to you?
*[Open-ended text field]*

17a. Why is that group important to you?
*[Open-ended text field]*

18. Have you ever decided not to post photos or other information about yourself because it might be read by current or future employers, Cal administrators, or other non-students?

1054 (64.4%) No
582 (35.6%) Yes

19. What is the BEST thing that has happened to you as a result of using Facebook?
*[Open-ended text field]*

20. What is the WORST thing that has happened to you as a result of using Facebook?
*[Open-ended text field]*

Notes: Counts are in bold, and precede items they are counting.
Notes: Missing values are not included in the counts.
Percents for multiple selection items are based on the total number of active cases.
Number of cases: 2107 (including 20 2nd degree/Limited students not counted in systemwide UCUES reports)

Response rate for module: 46.3%

## Appendix E. Summary of Student IT Requests

*The following tables summarize student input on how Berkeley could use information technology to enhance the student experience (undergraduate survey question 11; graduate survey #1 question 8; interview and focus group discussion question). Requests are grouped by area (academics, administration, student life), with some requests shown in multiple areas as appropriate.*

### Freshmen

| Academics | Administration | Student Life |
|---|---|---|
| All courses webcast | Expand myBerkeleyApp | No limit on bandwidth use in dorms |
| More podcasts | Online appointment systems | Ability to host websites |
| Basic IT classes | Improve CalSO to be more relevant | Proximity cards for all access on campus |
| More friendly library interface | Improving Tele-BEARS / scheduler | Wireless everywhere |
| Cell phone coverage everywhere | Improve the help desk | More help with logistics for commuters |
| Want more options for student learning | One access log-in | Create an online forum for students to help each other like at Cornell |
| Virtual shared workspaces for group study | Student portal | |
| Better scheduler for selecting courses | 24/7 helpdesk | |
| Train professors to use technology better | Billing should be sent to parents as well a student | |
| Want a professor rating program like ratemyprofessor.com but useful and legitimate | Want an automated CalSO counselor | |
| Wireless everywhere | Upgrade to T4 like at Stanford | |
| More help with logistics for commuters | Want computer labs open all the time | |
| Create an online forum for students to help each other like at Cornell | Include remote printing capability at computer centers | |
| | Wireless everywhere | |
| | More help with logistics for commuters | |
| | Create an online forum for students to help each other like at Cornell | |

**Transfers**

| Academics | Administration | Student Life |
|---|---|---|
| Podcast more lectures: audio is enough | Provide more guidance for purchase of appropriate computer equipment and internet connection services; [could] the university sell this to us? Tell us what to buy? [charge] on our CARS bill? Offer bulk discounts coupons? | Improve transportation, security resources on campus |
| Would like to see grades from midterms entered into Bear Facts | Continue to support the transfer student center | Wireless everywhere |
| Would like an online forum by major like at UCLA | Can there be technology resource people with office hours and appointments? | |
| Would like to have audio version of class readers like books on tape | The campus needs small resource centers in more places | |
| Want classroom materials to be more concise (better prioritizing of readings) | Please help students with remedial computer technology skills | |
| Wireless everywhere | Whatever improvements are made, it is crucial to keep tuition low | |
| | Wireless everywhere | |

**Graduate students**

| Academics | Administration | Student Life |
|---|---|---|
| There are better classroom management software packages available; choose one of them instead of bSpace[39] | The university needs to support web design; computers in the computer labs should be quick with web design software | Increase CalMail storage limits; should refresh automatically, is too difficult to learn |
| All films at the media resource center should be digitized and available online | Library website needs to be simplified | It would be nice to have the Cal version of Yahoo! groups so people did not need to create Yahoo! accounts |
| Professors and students don't use bSpace effectively | University website reflects lack of centralization and is very confusing; uses too many cute names | Need help prioritizing email messages |
| Would like to see more filled out on courseweb | Coordinate licensing of specialized software that graduate students need | |
| bSpace needs improvements | Market Cal resources better | |
| Increase CalMail storage limits; should refresh automatically, is too difficult to learn | Improve majordomo mailing lists (e.g. you cannot unsubscribe to some lists even if the person managing the list has left and now spammers are sending to the list); also, it is hard to add people to CalMail mailing lists | |
| It would be nice to have the Cal version of Yahoo! groups so people did not need to create Yahoo! accounts | Would like a campus calendar system like the Google calendar program | |
| Need help prioritizing email messages | In CARS, would like to have a clear statement when payments are due and when they make a change. Would like an email and system to communicate with staff about the bill. | |

39. bSpace is Berkeley's class management system, powered by Sakai, a free, open-source software, (http://www.sakaiproject.org). It is used to create shared workspaces online for faculty and students. Find out more at https://bspace.berkeley.edu.

| Academics | Administration | Student Life |
|---|---|---|
| | Increase CalMail storage limits; should refresh automatically, is too difficult to learn | |
| | It would be nice to have the Cal version of Yahoo! groups so people did not need to create Yahoo! accounts | |
| | Need help prioritizing email messages | |

**Appendix F. Student Interview and Focus Group Flyer and Handout**

*The following flyer is a sample of the flyers used to recruit student interview and focus group participants for this project.*

# Your opinion matters

## *...and we want it*

Student IT @ Cal™

Campus-sponsored study on your expectations about technology at Cal

★ Attend a focus group ★

Seeking "first-years":
- Freshmen
- First-year transfers
- First-year grad students

Pizza & drinks provided!

**Sponsored by:**
Associate Vice Chancellor-IT & CIO
Assistant Vice Chancellor for Admissions & Enrollment

**Conducted by:**
UCB staff through the Leadership Development Program

For more info: 642-0505 or UCBTechStudy@lists.berkeley.edu

*The following handout was provided to student interview and focus group participants to familiarize them with the scope and purpose of our discussion with them.*

### STUDENT IT EXPERIENCE AT CAL

**What is IT?**

Information technology (IT) is the generic framework of hardware and software that enables the exchange of digital information using a variety of tools, such as:

| | | |
|---|---|---|
| Computers (desktops, laptops) | cell phones, personal digital assistants (e.g., Blackberry, mylo) | digital recorders, cameras, storage devices or players (e.g., MP3 players, iPods) |

While it is true that these devices actually operate using different technologies—through telephone wires, cable lines, the ethernet, over cell towers, or on wireless networks—for the typical user their functionalities overlap. We use them to:

- access the internet,
- exchange text, audio, and video,
- obtain goods and services, and
- communicate with other people.

**What is the Student Experience?**

The student experience is the full spectrum of activities a student may do while at UC Berkeley. We've chosen to divide these activities into four categories. Here are some examples.

| | |
|---|---|
| Academic<br>• studying<br>• doing research<br>• communicating with instructors<br>• preparing for grad school or a career<br>• getting advice, tutoring, or help | Residential<br>• getting housing<br>• purchasing the right equipment<br>• setting up Internet access<br>• getting a job while in school<br>• meeting your health care needs |
| Administrative<br>• selecting and registering for classes<br>• paying tuition and fees<br>• transferring credits or getting transcripts<br>• applying for and receiving financial aid | Social<br>• making and maintaining friendships<br>• student government or clubs<br>• pursuing hobbies or interests<br>• balancing work and play |

**What is the goal of the study?**

We would like to capture a broad range of student perspectives and opinions. How does IT at Cal work for you in any aspect of your student experience? Does it meet your expectations? Are you satisfied?

**Who are we?**

We are a team of eight staff members at Cal who are participating in a Leadership Development Program. We are not technology experts but we will relay your opinions, ideas, and suggestions to people who are. This study is sponsored by Shel Waggener, the Chief Information Officer and Associate Vice Chancellor for IT, and Susie Castillo-Robson, the Acting Associate Vice Chancellor for Admissions and Enrollment. They want input from students to help with short-term improvements to student services system and long-term planning for IT at Cal.

**For More Information:** phone 642-0505 or write UCBTechStudy@lists.berkeley.edu

## Appendix G. Student Interview and Focus Group Questions

*The following questions and other prompts were used by project team members during student interviews and focus groups. See the "core open-ended questions" lower on this page for the main questions asked at the focus groups.*

### Student IT Experience at Cal Interview Questions

Our goal is to perform exploratory interviews to gather an overview of student satisfaction and expectation for technology on campus. Keep the student talking. One or two questions may be enough to cover all of the core content. However, this list provides different options for the wording and some optional follow-up questions that may be helpful in certain situations.

**Essential Personal Info**

Do you consent to this interview? (Sign the form.)
Name:
Age:
Major or intended field of study:

**Preferred Personal Info**

Do you live in university housing?

Which other schools have you attended? (For graduate and transfer students)

Have you been interviewed or surveyed about technology before?

**Core open-ended questions (the heart of focus groups)**

1a. What technologies do you use? b. What's your favorite and why?

2. (pick one) What do you see as the most effective and exciting use of technology at Cal? What have you learned? How does IT help your life at Cal?

3. (pick one) What doesn't work? What needs to be improved? How does IT hinder your life at Cal?

4. (pick one) How (else) could Cal use IT to enhance the student experience? What would be the best technology that Cal could bring to campus? (Encourage blue sky, sky's the limit, outside the box thinking.)

5. How should the campus receive this input from students on an ongoing basis?

6. Anything else?

*Reference List of Follow-up questions for specific groups*

**For anyone:**

- Why did you choose to attend Cal? Did you consider technology resources when deciding which college to attend? How important is technology to your overall satisfaction at Cal?

- If you compare yourself to other students in your year at Cal would you say that your skills in information technology are:

    - better than most of my classmates
    - about the same as everyone else
    - lower than average and I want to improve
    - I hate technology

- Are you concerned that information you provide via the internet is used for commercial purposes? e.g., that your search information given to Google may be used for targeted advertising.

- Do you get the info you need to select classes, professors?

- Are you concerned about cyber stalking? Are you concerned about identity theft?

- Some people say there is a digital divide between those people who have access to information technology and those who don't. Would you agree?

- Have your technology skills improved this semester? How and why?

- What do you consider the single most important factor in a good education?

**For transfer and graduate students:**

- How does IT at Cal compare to IT at your previous school?
- Does Cal provide adequate training and support your IT needs?
- Do you think entering freshmen use IT differently than you do?

**For "techno mentors":**

- What do students most need help with? How about what professors most need help with?
- How do you customize your computing environment? Is there anything you do that would work well for other students?
- What is it like to be seen as a technology wizard?
- How would you like to contribute suggestions to those who control the IT budget

**For those who consider themselves "below average" or who hate technology:**

- How can Cal best help you?

**For those who do not live in University housing:**

- Do you have the tools and skills necessary to access information technology resources on campus?

**Reference List of Types of Technology Use**

- use a computer not connected to the Internet
- use a computer connected to the Internet
- use word processing on a computer (e.g. MS Word)
- search on the Internet (e.g. using Google, Yahoo!, msn search)
- computer programming (e.g. using Java,VB, C/C++ etc)
- write or read email
- use IM on a computer
- update a blog (e.g. LiveJournal, MySpace, blogger, etc.)
- read or commented on others' blogs
- participate in chat rooms (e.g. IRC)
- use the social networking service (e.g. Friendster, facebook, tribe)
- play online games on a computer
- play video games on a console (e.g., PS2, Xbox, Nintendo)
- use a web cam
- talk on a mobile phone
- use text messaging on a mobile phone
- listen to music on a portable MP3 player
- take pictures with the digital camera
- upload pictures to the Internet
- download video from the Internet
- upload video
- use a collaborative workspace for a course
- remove the virus from a computer
- remove spyware from a computer
- set up an RSS feed to keep current in your field
- set up a firewall
- create animation
- create a group work space
- set up a system to filter and organize email
- forward email from one account to another
- taught friends IT task
- taught parents IT task
- taught instructor IT task
- Do you turn off pop-ups in your browser defaults?
- Did you ever download an entire book and read it from the screen or print partially?

- Are you familiar with online banking and billpay?
- Are you familiar with GPS? Do you use any online internet direction services?
- Do you use VoIP services? (e.g. Skype)
- Use clickers in class
- Use Endnote to prepare bibliographies?
- Use online communities to sell or buy goods? Get jobs? Get rentals?
- Web hosting
- Online meetings (WebEx)
- Announce an event online
- Go to academic opinion sharing website (ratemyprofessor.com)
- Post a résumé online

If you are unfamiliar with a technology your interviewee mentions, this is a strategy from FreshQuest[40] for finding out more:

When did you first see X?
When did you first use X?
What do you think about X?
What do you mean by X?
Please you figure it out from?
How did you figure out how to use X?
What you do when you need help using X?
When you use X? What situations?
Tell me about it time you did X?
Do you like X?
How do you compare to your friends with X? Frequency? Ability?
Have you ever shown anyone else how to X?
Have you ever told other people about X?
What do your friends say when he started using X?
Do your conversations on X turn into face-to-face?

40. Finn, Megan, and David Schlossberg, *Adoption and Negotiation of Technology in the Lives of Berkeley Freshman*, Freshquest, University of California, Berkeley, May 2005, http://groups.sims.berkeley.edu/ikids/freshquest/FreshQuest%20-%20Adoption%20and%20Negotiation.pdf.

## Appendix H. Student Interview and Focus Group Input Summary

*The following summarizes the input received through student interviews and focus groups.*

*Participants—Summary*

We interviewed a total of 42 students: 28 freshman, 8 transfer students, and 6 first-year graduate students. Among the graduate students were Cal alumni and one was a Cal staff member. 25 of the freshman lived in university housing; one lived in a private dorm, one had started the year in university housing and had moved out, and the other lived at home. Only one each of the transfer and graduate students lives in university housing.

*Participants—Themes*

Most of the freshman, and transfer students, and first-year graduate students we interviewed share being newcomers to the Cal community. As newcomers they need to navigate multiple parallel organizations to be effective in a large, decentralized, complex organization. Some of the tasks of orienting newcomers to Cal can be shared across all faculty, staff and students. Newcomers need to obtain housing and negotiate transportation and parking as well as learn to get around campus and the city. Issues surfaced within the group and individual interviews that reflect adjustments to a dense urban environment where the cost of living is very high. Although our focus was technology there were responses about secure elevators, proximity keys, crime, and reluctance to cross campus at night. Personal safety concerns were particularly stressed by women students who were commuters and dependent on technology resources on campus.

*Technologies Used, Skill Levels, and Access*

We asked each group and individual to describe the technologies they use, which they prefer, and (for the individual interviews) how they would assess their technology skill levels. The range of responses from "older" interviewees—the transfers and graduate students—did not seem significantly different from those of freshman, so we have summarized this information for students across the three populations.

It is a given that students own computers and use email. Cell phone ownership and knowledge of Microsoft Word is near 100%. Most students have laptops; those who don't are considering it. Most students use some sort of social networking service, Google and Wikipedia. Most freshmen use text messaging and IM extensively. Many students use iPods or other MP3 players, digital cameras, YouTube, and various websites for shopping and gaming. We also had respondents that regularly use WebCams and voice over IP (e.g. Skype), and do website design, programming, building or customizing of computers, or are linux aficionados. Some graduate or transfer students mentioned specialized software for their fields of study: Matlab, ChemLab, GIS environmental design software, AutoCAD, Macromedia Fireworks.

The students we interviewed represent a range in technology interest, experience, and skill levels. One respondent (a transfer) felt that his lack of skills and poor equipment prevents him from learning one of the most exciting subjects in his field. He believes that remedial computer

skills should be taught through the university. However, other respondents who considered themselves "below average" in their technology skill levels feel that they were still capable of meeting their academic goals.

Access to online resources is crucial for students to meet their academic, administrative and social goals. Those students who lack financial resources for up-to-date computers or Internet access from home are at a distinct disadvantage. One transfer students described her dilemma in relying on university-run computer centers. She had one professor who gave assignments on Saturday evening that were due Monday morning. The IST-run computer centers are not open Sunday morning so she needed to plan her weekend around doing her assignment Sunday afternoon; because of the technology access limitation, she lost 12 hours of work time on the assignment.

It should be kept in mind that any break in connectivity is disruptive to student life. One freshman respondent, for example, was punished for exceeding the bandwidth quota in her dorm by a one-week exile from connectivity. She considered this an overly harsh punishment even though she still had access to the internet through the Academic Center in her dorm.

Although commuters may have the primary equipment they need, other equipment such as cable, modems, software and choice of internet services can be confusing and different for students to configure on their own.

*Student Services: the Good and the Bad*

We asked respondents if there was any technology on campus that was exciting or had a "wow" factor. Unprompted answers were sparse but included: fast Internet connections in the dormitories, paperless bills, several endorsements of the Media Resource Center (film library), library proxies, specialized equipment in the optometry clinics, free wireless, and classes that are webcast. Praise also went to the job site coordinated by the public health department. With prompting, students praised the Cal 1 card, library search technology, proximity keys, DC++, and myBerkeleyApp.

Our interviewees were more forthcoming with complaints, particularly about the following services:

- Flaws in wireless coverage (certain buildings and portions of dorms)
- Flaws in cell phone coverage (certain buildings on campus)
- Problems with CalMail (too little capacity to send, receive and store image and audio files; too much spam; too awkward and difficult to use; ugly)
- Problems with CARS billing (not updated often enough; confusing; wrong)
- Complaints about university websites (cumbersome, obsolete, too much information, etc.)
- Complaints about technology help desk and computer labs (not enough hours or help)
- Problems with scheduling classes (not enough info; info in too many separate places; some sites not complete or up to date)
- Problems finding out information about majors and other academic requirements

*Suggestions and Wish List*

Because students are acclimated to online environments, they often request services to be like those that they've encountered in the private sector:

- email like Gmail
- list serves like Yahoo! groups
- a student evaluation system of professors like ratemyprofessor.com
- automated CalSO counselor like US Army avatar
- a campus calendar system like the Google calendar program

The following are responses broken out by population:

Freshman

- wireless everywhere
- all courses webcast
- more podcasts
- Expand myBerkeleyApp
- basic IT classes
- online appointment systems
- more friendly library interface
- cell phone coverage everywhere
- improve CalSO to be more relevant
- want more options for student learning
- more help with logistics for commuters
- improving Tele-BEARS and class scheduler
- virtual shared workspaces for group study
- improve the helpdesk
- one access log-in
- student portal
- better scheduler for selecting courses
- no limit on bandwidth use in dorms
- ability to host websites
- 24/7 helpdesk
- billing should be sent to parents as well a student
- train professors to use technology better
- proximity cards for all access on campus
- want a professor rating program like ratemyprofessor.com but useful and legitimate
- want an automated CalSO counselor
- upgrade to T4 like to Stanford
- want computer labs open all the time
- include remote printing capability at computer centers
- create an online forum for students to help each other like at Cornell

Transfers

- wireless everywhere
- podcast more lectures: audio is enough
- provide more guidance for purchase of appropriate computer equipment and Internet connection services: can the university sell this to us? Tell us what to buy? Let us charged on our CARS bill? Offer bulk discounts coupons?
- improve transportation, security resources on campus
- continue to support the transfer student center
- can there be technology resource people with office hours and appointments
- the campus needs small resource centers in more places
- please help students with remedial computer technology skills
- what ever improvements are made it is crucial to keep tuition low
- would like to see grades from midterms entered into Bear Facts
- would like an online forum by major like at UCLA
- would like to have audio version of class readers like books on tape
- want classroom materials to be more concise (she wants better prioritizing of readings)

Graduate students

- increase CalMail storage limits; should refresh automatically, is too difficult to learn
- there are better classroom management software packages available choose one of them instead of bSpace
- the university needs to support Web design; computers in that computer labs should be a quick with web design software
- library website needs to be simplified
- all films at the media resource center should be digitized and available online
- professors and students don't use bSpace effectively
- university website reflects lack of centralization and is very confusing; uses too many cute names
- coordinate licensing of specialized software that graduate students need
- market Cal resources better
- improve majordomo mailing lists (e.g. you cannot unsubscribe to some lists even if the person managing the list has graduated and left and now spammers are sending to the list); also, it is hard to add people to CalMail mailing lists
- it would be nice to have the Cal version of Yahoo! groups so people did not need to create Yahoo! accounts
- need help prioritizing email messages
- would like a campus calendar system like the Google calendar program
- In CARS, would like to have a clear statement when payments are due and when they make a change. Would like an email and system to communicate with staff about the bill.
- would like to see more filled out on CourseWeb
- bSpace needs improvements

*Suggestions for Ongoing Collection of Feedback*

Freshman

- Use an electronic survey with incentives such as 50 $ iTunes card or ASUC bookstore points
- Technology forum
- Technology discussion board
- Do it automatically (data mining)
- Involve students in the CIO office such as on a student task force or GSR positions
- Target students during welcome week
- Lobby instructors to get students to participate
- Follow our suggestions so we know our input is actually used

Transfers

- Students don't take electronic surveys seriously so face-to-face contact is crucial
- Free food is a good incentive
- Surveys are superficial. Face-to-face communication and gives people the opportunity to think about things and come up with this idea that well as more specific examples about their exact situation
- Ask professors to give students time in class to complete a questionnaire
- It might be useful to have a student committee on IT but it would be difficult to solicit a diverse response.
- Come to student classes or workshops

Graduate students

- Face-to-face feedback is the most genuine
- Doesn't want data mining!!!
- Focus groups have the advantage of brainstorming and going more in-depth
- Have the student affairs officers collect information from each department
- Have the IT employees in each department give an idea about what that department needs
- On website it would be nice for their always to be a comment/feedback button to provide specific input
- If there is money to fund student committee it could work; otherwise, focus groups would be nice

## Appendix I. Student Interview and Focus Group Participants Profile

*The following table provides a profile of the student interview and focus group participants.*

| Freshman, Transfer or Grad | Gender | Field of interest | Commuter? | New to Cal? | Focus Group or Individual Interview | Date of Focus Group or Interview |
|---|---|---|---|---|---|---|
| Freshman | F | Undeclared | No | Yes | Focus | 11/1/2006 |
| Freshman | F | MCB or psychology | No | Yes | Focus | 11/1/2006 |
| Freshman | F | Business | No | Yes | Focus | 11/1/2006 |
| Freshman | F | Psychology | No | Yes | Focus | 11/1/2006 |
| Freshman | F | Undeclared | No | Yes | Focus | 11/1/2006 |
| Freshman | M | Business | No | Yes | Focus | 11/1/2006 |
| Freshman | F | Psychology | No | Yes | Focus | 11/1/2006 |
| Freshman | M | Undeclared | No | Yes | Focus | 11/1/2006 |
| Freshman | M | English | No | Yes | Focus | 11/2/2006 |
| Freshman | M | Undeclared | No | Yes | Focus | 11/2/2006 |
| Freshman | F | Business | No | Yes | Focus | 11/2/2006 |
| Freshman | M | Political Science | No | Yes | Focus | 11/2/2006 |
| Freshman | F | MCB | No | Yes | Focus | 11/2/2006 |
| Freshman | M | Undeclared | No | Yes | Focus | 11/2/2006 |
| Freshman | F | Psychology | No | Yes | Focus | 11/2/2006 |
| Freshman | M | Business | No | Yes | Focus | 11/2/2006 |
| Freshman | F | Undeclared | No | Yes | Focus | 11/2/2006 |
| Freshman | M | Business and Psychology | No | Yes | Focus | 11/2/2006 |
| Freshman | M | History | No | Yes | Focus | 11/2/2006 |
| Transfer | F | Sociology | No | Yes | Focus | 11/2/2006 |
| Transfer | F | Sociology | Yes | Yes | Focus | 11/2/2006 |
| Transfer | F | Sociology | No | Yes | Focus | 11/2/2006 |
| Graduate | F | Optometry | No | Yes | Focus | 11/6/2006 |
| Graduate | M | Mechanical Engineering | Yes | Cal alumni | Focus | 11/6/2006 |
| Graduate* | F | Practice of Art | Yes | Cal staff | Focus | 11/6/2006 |
| Transfer | F | Operations Research & Management | Yes | Yes | Focus | 11/6/2006 |
| Transfer | M | Environmental Science (Natural Resources) | Yes | Yes | Focus | 11/6/2006 |
| Graduate | F | Optometry | Yes | Cal alumni | Focus | 11/8/2006 |

| Freshman, Transfer or Grad | Gender | Field of interest | Commuter? | New to Cal? | Focus Group or Individual Interview | Date of Focus Group or Interview |
|---|---|---|---|---|---|---|
| Graduate | M | Sociology | Yes | Yes | Focus | 11/8/2006 |
| Freshman | M | Civil Engineering | No | Yes | Individual | 11/9/2006 |
| Graduate | F | Public Health | Yes | Cal alumni | Individual | 11/27/2006 |
| Transfer | F | MCB | Yes | Yes | Individual | 11/27/2006 |
| Freshman | M | Business and Computer Science | No | Yes | Individual | 11/29/2006 |
| Freshman | F | MCB | No | Yes | Individual | 11/30/2006 |
| Freshman | M | Psychology | No | Yes | Individual | 11/30/2006 |
| Freshman | M | Business or Economics | No | Yes | Individual | 11/30/2006 |
| Freshman | F | Psychology | Yes- started in dorm | Yes | Individual | 12/1/2006 |
| Freshman | F | Operations Research & Management | No | Yes | Individual | 12/1/2006 |
| Freshman | F | Business and History | Yes- "private dorm" | Yes | Individual | 12/5/2006 |
| Freshman | M | MCB | Yes | Yes | Individual | 12/5/2006 |
| Transfer | F | Religious Studies | Yes | Yes | Individual | 12/6/2006 |
| Transfer | F | American Studies/Disability Rights | Yes | Yes | Individual | 12/7/2006 |
| *Re-entry student completing undergraduate degree who identified as graduate | | | | | | |

## Appendix J. IT and Online Resources for the New Students at Berkeley

*Below are websites and applications explored during this project in order to understand the online tools students currently have available to pursue their academic and administrative goals.*

*Introduction to Names*

Our campus has the official name of University of California at Berkeley. This is frequently abbreviated by those outside campus as UC Berkeley, and further shortened to Berkeley or UCB. Since the University of California began at Berkeley, historically it was called California, shortened now to Cal. Within the campus, Cal is most frequently used by students.

The California State animal, the grizzly bear, became the University of California's mascot as well. Names for websites and services for Berkeley students often contain "Cal" and "bear" in various combinations.

*Student Services*

Bear Link, is a portal for online student systems with links to Bear Facts, Tele-BEARS, Info-BEARS, Summer Tele-BEARS, the Course Web System, and Tele-BEARS Drop Hotline, http://bearlink.berkeley.edu/

Bear Facts, provides access to student information systems, such as registration, billing, financial aid, grades, registration, and class schedules, http://bearfacts.berkeley.edu/
The secure sites accessible through Bear Facts include:

- Statement of Legal Residence
- Registration
- Degree Audit Reporting (DAR), where students can see the courses they have completed, or successfully transferred from another college, and credits they have received
- Financial Aid
- Department Student Awards Systems (DSAS)
- Cal Accounts Receivable System (CARS) (provides financial statement)
- e-bill/e-check (how people actually pay)
- Tele-BEARS, class enrollment system
- Tele-BEARS Drop Hotline
- Info-BEARS (this is an older version of Tele-BEARS; some features still available)

bSpace is Berkeley's class management system, powered by Sakai, a free, open-source software, (http://www.sakaiproject.org). It is used to create shared workspaces online for faculty and students. Find out more at https://bspace.berkeley.edu.

Cal 1 Card, is a student identification card integrated with a credit card to be used for campus purchases, http://services.housing.berkeley.edu/c1c/static/index.htm

CalMail, is Berkeley's webmail interface for the free email accounts offered to students and staff. (A previous interface, BearMail, is also still available.) All students are required to have a Berkeley.edu email address, https://calmail.berkeley.edu/

CalNet, an identity management service that assigns students with a CalNet ID to use to obtain online access to secure sites, https://calnet.berkeley.edu/

"Cal Student Connection," on the Berkeley homepage, is a link to frequently used sites, http://www.berkeley.edu/

CourseWeb, is set up to provide online information about courses and is linked to each course listed in the schedule of classes; unfortunately, much information is missing, https://courseweb.berkeley.edu/courseweb/index.jsp

Course Web System, (link on Bear Link) provides a list of departments, with links that reveal current course offerings, http://infobears.berkeley.edu:3400/courseweb/

General Catalog, including many links for gathering information about majors and degree requirements as well as comprehensive list of courses, http://catalog.berkeley.edu/

myBerkeleyApplication, is a secure site for prospective students to track their applications, and for provides an interactive checklist for selected students to complete steps in transitioning to school

Schedule of Classes, list current and upcoming semester's classes, plus final exam schedule, http://schedule.berkeley.edu/

Statement of Intent to Register, an online form for accepted students

*Student-Created Workarounds*

Aman's Interface to Berkeley Schedule of Classes,
http://www.ocf.berkeley.edu/~amanb/makeSched/

Final Distance Perfect Schedule Generator, http://finaldistance.berkeley.edu/

*Orientation Materials*

*Bear Necessities, a Guide to Living on Campus*
http://www.housing.berkeley.edu/student/06_Bear_Necessities_Guide.pdf

*Be Smart, Be Secure*, and *Get Connected,* Residential Computing's teaching cartoons for orientation to computing http://www.rescomp.berkeley.edu/

Cal Day, the campus annual open house, http://www.berkeley.edu/calday/

CalSO, Cal Student Orientation, takes place at the start of each semester. The CalSO website also supplies links to resources and information,
http://services.housing.berkeley.edu/NSS/Content/Welcome.html

Connecting@Berkeley CD, is an award winning, free set of tools to secure and connect computers, http://cab.berkeley.edu/

*Resource,* new student services guide (freshman), http://resource.berkeley.edu/

*Transfer Student Handbook, a Guide for UC Berkeley Transfer Students*
http://transfer.berkeley.edu/Transfer%20Student%20Handbook.pdf

*Where to Begin, a Guide for New Graduate Students*
http://www.grad.berkeley.edu/new_students/pdf/where_to_begin.pdf

*Advising Resources*

CalMax, Cal Major Academic Exchange, supplies mentors for transfer students. They have posted video tips on advising and financial frequently asked questions
http://reentry.berkeley.edu/newstu.htm

Engineering@Cal, Great Minds Online (an example of forum for networking. Many other colleges have this as well, https://engineeralum.berkeley.edu/indexEngineering.asp

*Finding Your Way* (advising guide for freshman in the College of Letters and Sciences)
http://ls-yourway.berkeley.edu/index.html

Learning Library (orientation workshops for research skills),
http://www.lib.berkeley.edu/TeachingLib/

Petition to declare a major (in the College of Letters and Sciences) with instructions,
http://ls-advise.berkeley.edu/fp/08Declare_Maj.pdf

*Step By Step*, a guide to preparing for graduate school for Berkeley undergraduates in Arts & Humanities and Social Sciences
http://ls.berkeley.edu/stepbystep/

Student Life Advising Services, Educational Opportunity Program, http://slas.berkeley.edu/

*Service Centers*

Workstation and Microcomputer Facilities (IST-run computer labs)
http://facility.berkeley.edu/facilities.html

Residential Academic Centers (computers labs in dorms), http://www.rescomp.berkeley.edu/

Open Computing Facility (student controlled), http://www.ocf.berkeley.edu/

Disabled Students' Program, http://dsp.berkeley.edu/sbin/dspACCESS.php?_page=home

Student Learning Center, http://slc.berkeley.edu/general/index.htm

Services for International Students and Scholars (SISS), http://www.ias.berkeley.edu/siss/
Transfer, Re-entry, and Student Parents Center, http://reentry.berkeley.edu/

## Appendix K. Student Input Contacts

*At the request of the project team, the following individuals provided advice and support with recruitment of student participants and collection of student input.*

| **Name** | **Title & Department** |
|---|---|
| Bejinez, Livier | Administrative Director, Fall Program for Freshmen, UC Berkeley Extension |
| Finch, Dawn | Public Information Specialist, University Health Services |
| Handman, Gary | Head, Media Resources Center, Instructional Services, Doe / Moffitt Libraries |
| Kask, Lani | Lecturer, Fall Program for Freshmen, UC Berkeley Extension |
| Olivares, Cristobal | Health Educator, University Health Services |
| Padilla, Je Nell | Manager, Research and Planning, Residential and Student Services Programs (RSSP) |
| Rivas, Eva | Director, Transfer, Re-entry, and Student Parent Center |
| Smith, Andrew Kent | Senior Research Analyst, Graduate Division |
| Sui, Judi | Financial and Data Services Manager, Graduate Division |
| Thomson, Gregg | Director, Office of Student Research |
| Wahl, Ken | Associate Director, Office of Student Research |
| Williams, Ron | Coordinator of Re-entry Student Programs and Services, Transfer, Re-entry, and Student Parent Center |

## Appendix L. Key Providers at UC Berkeley

*The following table lists UC Berkeley personnel who were identified as key providers of information technology (for the purposes of their potentially being interviewed for this project) and indicates those interviewed.*

| **Academic areas only** | **Interviewed** |
|---|---|
| Barbara Davis (Undergraduate Education) | |
| Bob Giomi (Engineering) | |
| Avis Hinkson (Academic Advising L & S) | |
| Lourdes Miranda (College of L&S) | x |
| **Administrative areas only** | |
| Faye Fields (Billing/Payment Services) | x |
| Michelle Kniffin (Assignments and Cashiers) | |
| Cheryl Resh (Financial Aid) | x |
| Walter Robinson (Admissions) | x |
| Richard Russo (Summer Sessions) | |
| Joyce Sturm (Billing/Payment Services) | x |
| Walter Wong (Registrar) | x |
| **Student life areas only** | |
| Dedra Chamberlin (Residential Computing) | x |
| Claudia Covello (University Health Services) | x |
| Tom Devlin (Career Center) | |
| Devin Kinyon (New Student Services) | x |
| Nadesan Permaul (ASUC and former Parking Director) | |
| Jonathan Poullard (Student Life) | x |
| Mike Weinberger (Rec Sports) | |
| **Mix of two or more of the above areas** | |
| Randy Ballew (IST (formerly SIS) architect) | |
| Angela Blackstone (Information Technologies) | x |
| Christopher Chin (AirBears) | |
| Tony Christopher (front end of myBerkeleyApp) | x |
| Victor Edmonds (ETS) | x |
| Roseanne Fong (New Student Services) | x |
| Steven Hansen (Web Applications) | |
| Tim Heidinger (Computing & 2012) | x |
| Steve Immel (Technology Acquisitions / Sales) | |
| Christina Maslach (ETS) | x |
| Steve Masover, IST (formerly SIS) architect | |

| Mix of two or more of the above areas (continued) | Interviewed |
|---|---|
| Bernie Rossi (Service Desk CalMail & WebFiles) | x |
| Jan Sartain (Service Desk CalNet) | |
| Sian Shumway (Microcomputer facilities) | x |

## Appendix M. Key Providers Interview Themes

*The following themes were observed across Key Provider interviews.*

*According to Key Providers, students want…*

- Access 24/7/365
- A central call in, email, or live link station to answer questions (like Ask.com)
- Blogging
- Use of myBerkeleyApp or other flexibility to download into Facebook or a personal calendar, deadlines, dates, cued email reminders about financial aid, classes, etc. (a customizable one-stop interface but *not a portal*)
- CalMail to look and function like Gmail
- Cal 1 Card to provide universal building access and purchasing for campus and non-campus vendors
- Clearer information: what is the process, who do I talk to when I have a question, why do I have to go to another website to find what I need
- Classroom: comfortable chairs, cleanliness, wireless, power to the seats
- Community: "I use Facebook to find study partners and friends"
- Course Availability: what courses are open and how do I get in
- Course evaluations online
- Processes to be easier
- E-billing and paying online
- Instant messaging
- Increased lab hours
- More data storage
- More Tele-BEARS hours
- Online appointment scheduling
- Online form submission and status checking
- Online transcript ordering
- Ability to find a person when they want a person (just to talk, personal connectivity)
- Reduced crime around dorm and greek areas
- Better spam filters
- Reduced wait times for many services
- More webcasting
- Wireless everywhere…that works and is not patchy

*According to Key Providers, they need…*

- A data warehouse: after myBerkeleyApp ends, there is no unified information about students or their records. Administrators rely on multiple locations for the same pieces of data that are not standardized from on application to another (Tele-BEARS, Bear Facts, CARS, myBerkeleyApp)
- A student-centered campus approach
- A better way to communicate with their students and their students' parents (minding FERPA & HIPAA)
- Standardized data collection and reporting
- Parent log-in or CalNet authentication (parents call about information students have but they do not have access to)
- A way to deal with late admits, spring admits, and withdrawals
- Human capital to handle parent, student, and faculty requests
- Flexible campus systems: separate departments and best practices need a way to link into campus systems
- Faster communication among departments (X department does everything by paper and it takes them 2 weeks to get me x information)
- A Campus IT Council so IT departments can talk to each other about decisions and best practices
- Campus buy-in to setting certain standards so students are not hunting for information outside of my venue
- Allow students to use CalAgenda (Berkeley's appointment scheduling system for faculty and staff)

*According to Key Providers, they get information from…*

- Campus surveys (OSR, UCUES)
- Tracking student requests
- Their student workers
- Daily Cal (The Daily Californian is an independent, Berkeley student-run newspaper.)
- Other universities
- Yearly, semesterly, or touch surveys
- Focus groups
- Student advisory boards
- Searching the internet for student blogs, etc.

## Appendix N. Key Provider Codes for Cross-Case Analysis

*The Key Providers subgroup used cross-case analysis of collected interviews data. We looked for comparisons across multiple cases (interviews). In qualitative data analysis, data triangulation is widely recognized and used as the best method for proving results. Data triangulation for us came from the literature review and the interviews. In interviews, themes not only repeated but repeated within and across departments with different functions and levels of connectivity to students. True data triangulation came from comparison of this data with student and best practices data.*

- Access (24/7/365)
- Ask.com (Central place for questions)
- IM/Instant Messaging
- Blogging
- Facebook/MySpace
- CalMail/Gmail
- Courses
- Classroom
- Process/processes
- e-bill
- Purchasing
- Labs
- Data storage
- Online + (i.e., online purchasing, online form submission, online appointment)
- Community/connectivity
- Service
- Webcasting
- Wireless

## Appendix O. Key Provider Input Summary

*Below are additional summaries of Key Provider input.*

**Common student requests by type:**

| Academics | Administration | Student Life |
|---|---|---|
| CalMail to look and function like Gmail | Access to campus systems 24/7/365 | Cal 1 Card to provide universal building access |
| Classroom with comfortable chairs | A central call-in, email, or live chat to answer questions and help them navigate complex systems | Cal 1 Card to allow for purchasing for more campus and off campus vendors. |
| A clean classroom | A portal type system that continued beyond admission (yet many students like facebook and would like the flexibility to download checklists into their facebook or some other online calendar. | Want to find a person when they need one |
| Wireless in the classroom | E-billing and paying online that is updated more than once a month | Wireless in the dorms and everywhere |
| Power to the seats | More Tele-BEARS hours | Parent log-in or CalNet Authentication |
| Information on course availability | Online appointment scheduling | |
| Increased lab hours | Online form submission and status checking | |
| More Data Storage | Online transcript ordering | |
| Better spam filters | Reduced wait times for services | |
| More webcasting | A data warehouse to connect or manage all the campus systems with pieces of student data | |
| | Standardized data collection and reporting | |
| | A campus IT council | |

**Major themes according to Key Providers:**

- In order to serve students they must touch several systems with incomplete or inconsistent data. They need a data warehouse or a method for linking different systems so they do not have to hunt and gather information and build shadow systems to do this.
- If multiple campus systems will continue to exist, they would like standardized data collection and reporting between the systems.
- Students and their parents are linked. Students are not developmentally at a stage that they can handle all of their bills, academic, and health questions yet the current system is not flexible. As communication with parents has decreased with the end of mass mailing, parents are not informed properly and there are real implications for billing, registration etc.
- If multiple campus systems will continue to exist, administrators would like an IT Council where they could get together and coordinate standards and talk about best practices.
- In general, resource-rich departments, departments with three or more IT staff, were more knowledgeable about student needs than resource-poor departments. Resource-rich departments were more likely to build their own systems and collect student feedback data. Those that rely on other departments/campus for IT support were less able to adapt and did not collect student feedback.
- Students, by and large, are confused and do not have enough information to navigate the system correctly and efficiently; it frustrates them. As a result, they create "workarounds."
- Students want customizable, flexible systems in which they only need to enter a password once to get to the information they need. They are used to dotcom systems and want similar functionality when they come to campus. They do not necessarily want to pay for it though.

**Best practices used by Key Providers for gathering student feedback:**

- Surveys
- Focus Groups
- Student Workers
- Tracking Requests
- Other Universities
- Student websites and blogs

**Best practices for gathering administrator feedback:**

- IT Council to discuss student services best practices and build integrated campus solutions that work across departments
- Occasional Questionnaire

## Appendix P. Best Practice Interviewees

*The following individuals at UC Berkeley and peer institutions were interviewed about their student IT best practices.*

**UC Berkeley:**

Susanna A. Castillo-Robson, Associate Vice Chancellor of Admissions and Enrollment
Dedra Chamberlin, Manager, Residential Computing, Residential and Student Services Programs
Zane Cooper, Chief Technology Officer and Director, Haas School of Business–Computing Services
Elizabeth A. Dupuis, Associate University Librarian for Educational Initiatives and Director, Doe / Moffitt Libraries
Katherine Mitchell, Organizational Development Consultant, Center for Organizational Effectiveness
Karen Munro, eLearning Librarian, Instructional Services, Doe / Moffitt Libraries
Louise (J.R.) Schulden, Director, Information Services and Technology–Student Information Systems

**Other UC Campuses:**

*UC Davis*
Paul Drobny, Manager of Systems Technology, Student Affairs
Mark Stinson, Client Services Manager, Data Center & Client Services–Information and Education Technology

*UCLA*
Kathleen O'Kane, Assoc. Director, University Admissions and Relations with Schools
Ruth Sabean, Assistant Vice-Provost and Director of Educational Technology

*UC San Diego*
Margaret Backer, Director, Enterprise Web Application Development, Administrative Computing and Telecommunications
Gabriel Olszewski, University Registrar, Admissions and Enrollment Services

*UC Santa Cruz*
John Rocchio, Student Support Center Supervisor, ITS Student Support Services

**Other Campuses:**

*University of British Columbia*
Marian Schroeder, Assistant Registrar, Student Relations & Strategic Initiatives

*Carnegie Mellon*
Farhat (Meena) Lakhavani, Director of User & Educational Services
John Papinchak, Director of Enrollment Services and University Registrar Department

*University of Chicago*
Greg Anderson, Senior Director, NSIT General Services

*Duke University*
Bruce Cunningham, University Registrar

*Harvard University*
Paige Duncan, Director, Information Technology
Barry Kane, Registrar, Faculty of Arts & Sciences

*Indiana University*
Dennis Cromwell, Associate Vice President, University Information Systems
Sue Workman, Director, User Support

*University of Maryland*
Eloy Areu, Director of Student Applications Services
Jeff Huskamp, Vice President and CIO

*University of Michigan*
John Gohsman, Director, Student Administration & Human Resources Management
Paul Robinson, University Registrar

*University of Minnesota*
Tina Falkner, Associate Registrar, Office of the Registrar

*MIT*
Mary Callahan, Registrar
Oliver Thomas, Manager IT Help Desk

*Stanford University*
Surajit Bose, Technology Operations Manager, Student Computing
Allan Chen, Educational Technology Manager, Student Computing
Jennifer Ly, Consulting Manager, Residential Computing
Ethan Rikleen, Senior Network Administrator, Residential Computing

*University of Wisconsin*
Joanne Berg, Vice Provost and Registrar
Jim Helwig, Project Manager, My UW-Madison

*Yale University*
Jill Carlton, Faculty of Arts and Sciences Registrar and Director of Student Information Technology

## Appendix Q. Best Practice Interview Questions

*The following questions were asked during best practice interviews with peer institutions.*

1. What do you consider to be best practices for student information technology services in the university environment?
2. Which of the student IT services offered at your university do you consider best-in-class?
3. How did you decide to implement these services?
4. How do these services differentiate you from other peer universities?
5. How do you measure student satisfaction with these services?
6. Are there other services you'd still like to implement or any major improvements you'd like to make to current services?
7. What IT services offered by other universities would you consider best-in-class?
8. Would you consider offering those services at your university?
9. How do you measure student expectations for IT services on an ongoing basis?

## Appendix R. Best Practice Input Summary by School

*The following table, grouped by school, summarizes the best practice input received during interviews with peer institutions.*

| | |
|---|---|
| **UC Davis** | • Promote good relations and communications with vendors. Convince them to open their code by explaining that student systems need to be robust and flexible. Davis uses SunGard Higher Education's Banner software in a manner that allows growth and sharing of databases.<br>• Their centralized information system can incorporate small departments that are running their own systems as these departments see the benefits of integration.<br>• Integration of policy and transactions is the key. Students can detect compartmentalization and will pursue other avenues to obtain information and answers that suit their needs. Students find loopholes by observing how policy might be applied differently in similar situations and then use this to argue their case.<br>• Davis IT support staff is very customer focused. All calls, whether by students, faculty or staff, are treated equally from one office.<br>• Get support from upper management.<br>• Share resources amongst UCs.<br>• Where are the lines? The fact that people are waiting shows a need for a new service. Simple observation can be a good indicator of where problems or inefficiencies exist.<br>• New software tracks where and how students interface on webpages.<br>• Administrators across the system need to continue to communicate and increase their collaborative efforts. Administrators of various units (Enrollment Services, Financial Aid, Admissions) telephone conference informally monthly or quarterly. Neither formal notes nor websites hold content for these meetings. Client Services units attend the annual UC CSC conference and AVC enrollment services will be recommending annual, formal conferences be held based on results from their recent Fall conference in Burbank.<br>• Regularly look at other schools' organizational structures and active projects. |

| | |
|---|---|
| **UCLA** | • UCLA systems are 10 years old. Although by no means obsolete, there are significant changes that could be made.<br>• Would like to use Moodle (a free, open source software package, http://moodle.org/) to replace the multiple existing course management systems. This was initiated by the Faculty Committee on Education Technology.<br>• Administration and faculty need to impress on students that technology is meant to augment their educations and that it is not a means in and of itself.<br>• Look at the student experience holistically.<br>• Find common resources amongst UC campuses: consider allowing inter-campus credit for classes and allow students to take classes at multiple campuses. Provide course content online and allow credit also.<br>• Use systems well and integrate systems.<br>• Parents and alumni are integrated into central administrative systems.<br>• Would like to make similar look and feel to systems.<br>• Add class planner software.<br>• The Student Portal may shift to an "integrated portal landing page" that gives more behind-the-scenes tools for administrators working in student systems. |
| **UC Santa Cruz** | • Recent restructuring now provides all tech support, including residential tech support, through Information Technology Services (ITS). For students, this has taken the guess work out of where to obtain support.<br>• Recently moved to centralized support with all IT support, including residential technology support, coming from ITS.<br>• UCSC considers UCB residential orientation program "Best-In-Class." If resources were available, UCSC would consider a similar program.<br>• Getting stricter with copyright violators; new rules will go into effect next year.<br>• Plan to revitalize communication infrastructure next year. |

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| **UC San Diego** | • Tritonlink is the student system that provides the portal for the prospective and current student. Nodes are created as new departments integrate with Tritonlink. It is flexible and expandable and provides a central database for all users.<br>• Complement type of service w/level of personal service.<br>• Blink is the staff system implemented to allow for the huge increase of transactions needed to accommodate enrollment increases projected at 1.000 students per year. The goal was not to add a proportional number of staff to facilitate this change. Blink was implemented prior to, and helped model functionality of. Tritonlink.<br>• Ability to marry transactions with policies and procedures put UCSD in top 10% of efficiently run schools. Students alerted in real-time they have reached full-time status when enrolling. This has important implications for receipt of financial aid should the student inadvertently not register for enough classes.<br>• San Diego has beta tested and received positive feedback on their class schedule program. This allows a student to create different versions of a class schedule. This success will drive the change to implement this feature and expand it to allow a student's ultimate preferred schedule to be uploaded onto Tritonlink by one click.<br>• Students are okay with little face-to-face interaction regarding their IT services, but when they get to the point that they need human help they are usually frustrated and angry. |

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| **Carnegie Mellon University** | • Student registration and egrades submission are best practices.<br>• Member of the Kuali Student consortium.<br>• Wireless everywhere including dorm rooms.<br>• Centralized computing; centralized helpdesk.<br>• Required Computing Skills Workshop (pass/fail course).<br>• Conducting a study of teaching and learning styles to determine how to best design student IT services.<br>• Collaboration across campuses and across departments.<br>• Standardized a/v and tech throughout classrooms; know one classroom, know all classrooms.<br>• Different layers of student computing abilities:<br>Fluid – very proficient users; Middle – in between fluid and stable; Stable – conservative<br>• Want to upgrade computer clusters. They are heavily used by students as well as for classes. Want to re-design with flexible furniture, offer collaborative workspaces. |
| **Duke University** | • Duke created the "book-bag" feature, a shopping cart module duplicated by many others.<br>• Book-bagging has been very successful because it allows students to plan ahead. Best features allow administrators to see what students have signed up for and see potentially impacted classes; allows for better prep by faculty and administrators.<br>• Students are required to complete "book-bagging" two weeks prior to registration so faculty and administrators have time to make changes and/or get prepared.<br>• Edict from top to improve and centralize systems – no "option to opt out."<br>• Customized Peoplesoft SIS so much that they are unable to use upgrades. Would use the latest version of Peoplesoft SIS without doing all the customization, but that was not available when they made their changes. To use current Peoplesoft system now would be too dramatic a change.<br>• Working to integrate Blackboard and Peoplesoft<br>• Some challenges with portal; student can get services portal offers on their own; students would rather use the services they know.<br>• iPods required for many courses, i.e. languages, political science, and music. Duke made arrangement with Apple to download course materials.<br>• Students suggested using snail mail for official university mail; it would get their attention. |
| **Harvard University** | • Home grown enrollment system with "shopping module."<br>• Advising component on the portal considered a success. Prior to getting to school students can see who their advisors are and the advisors can see who their students are. Each student has three different university advisors and one peer advisor.<br>• Parents play a role in guiding their child through college |

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| **Indiana University** | • Students are connected to network within 5 minutes to 2 hours depending on their computers. Students are provided with a CD to get connected, and virus protection and security software.<br>• Several initiatives came together to create the "perfect storm" to force the change to connection service; "blaster" problems demonstrated the need to clean up computers due to too many viruses.<br>• Some challenges making current SIS package as user-friendly as legacy system.<br>• They are considering outsourcing email. There will be challenges such as potentially being put on a spam blacklist for too many bulk emails. There also could be FERPA issues, but they will work to keep personal information out of email. There could be a tech service fee to students if email outsourced.<br>• Provost secured $20 million in state funds to upgrade and develop IT on campus.<br>• Wrote program for safe connectivity; sold to LSU.<br>• Great contracts with Dell and Microsoft; deep discounts on hardware; offer free distribution of software; keep costs down by keeping equipment for only the three years it is under warranty.<br>• Want similar contracts with Apple; students see Macs as cool; what is cool is what they want to use.<br>• Want to extend Microsoft contract to include voice over IP, video conferencing; IM using network ID which gives tracking capability to learn what students are asking for.<br>• Virtual labs provide all the software that is available in the labs on their computers so they can go anywhere with it. 98% of students own their own computers.<br>• Best to stay with university services and not to compete with services students use and like (e.g., Facebook, IM)<br>• Strike a balance between what students want and what is practical and economical to offer. Students do not understand costs and their expectations change rapidly. |

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| **MIT** | • Students want their system to match retail/commercial systems to offer similar ease of functionality; challenge for university to do so.<br>• Wireless everywhere.<br>• Blog set up by admissions to talk to incoming students is considered very successful. It serves to help to answer incoming students' questions, which in turn helps to alleviate students' fears and anxieties relative to starting college.<br>• Changes can come from the bottom up; students go ahead and design systems which then catch on and become system-wide, e.g., shuttle tracking system and a wireless locator system that enables friends to find friends.<br>• New admission site.<br>• Course enrollment system was developed by a student; it integrates catalog with schedule function; states what needs to be taken; makes suggestions for fulfilling requirements; contains an online shopping module; and builds grid to display schedule.<br>• Faculty brings the most weight to decisions; satisfied faculty will impact students positively. Do not allow IT to dominate decisions.<br>• Want to offer online subject evaluation; could use open source, so may not have to start from scratch.<br>• Open Courseware, large scale and web-based, provides MIT course materials for everyone on the web. Considered a great success reaching around the world, however, not sure to what extent it helps existing students.<br>• Despite emphasis on what faculty wants, students should still be involved in information planning and implementation. The administration makes a concerted effort to help students. |

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| **Stanford University** | • Annual survey tracks the ratio of MAC users to PC users. This data is used to equip a corresponding ratio of computer clusters.<br>• Residential Computer Consultants (RCCs) provide the first line of support in residence halls. These are paid student positions. Much support is an informal process. Students have access to RCCs in residences or the dining commons. One RCC per 100 students is staffed for undergraduates. RCCs also provide a source for defining needed improvements.<br>• Currently the ratio is about 50:50 MAC to PC.<br>• Computer clusters in residences vary from 2–25 units depending upon the size of the residence they support. The computers have specialized, expensive applications, that in many cases, would only be needed for one class.<br>• There are new installations of "Quick-in-and-out" computer stations conveniently located to allow students to check emails or perform other short tasks.<br>• Stanford does not intend to provide IM nor social features such as Facebook. The Stanford music channels were discontinued given competition from commercial enterprises.<br>• Wallenberg Hall is a state-of-the-art media center with flexible furniture offering collaborative space for students to work in groups<br>• Quick connection to network upon arrival at school; students come expecting wireless and often arrive without a network cable.<br>• Students are considered clients to be served. |
| **University of British Columbia** | • Online payment of fees<br>• Blogs<br>• Student-centric system<br>• Mentioned University of Texas at Austin and Cornell's integrated message center<br>• One-stop, self-services for prospects<br>• Implementing Client Relationship Management system for prospective students<br>• Implementing an integrated planning tool utilizing a number of existing systems components (e.g. degree audit, registration work lists, fee assessments, class scheduling) that would allow prospects, applicants, and students to plan their academic year. |

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| **University of Chicago** | • O-Festival, a student/parent event, offers entertainment along with student card ID issuance and backpack given to students containing connection tools along with instructions. It is a welcoming and warm event and establishes residence connections; also, students get help from other students.<br>• State-of-the-art media labs, flexible furniture, collaborative spaces for group and team work. There are areas where food can be eaten that are open 24/7.<br>• Creating multimedia recording studios in libraries; can do podcasts. There are consultants present to help students learn how to use equipment.<br>• Want voice over IP like Vonage.<br>• Challenge to incorporate retail services into university services.<br>• Social space becoming technology space; technology space can become social space.<br>• Incorporating calendaring into email; finding calendaring can no longer stand alone. |
| **University of Maryland** | • Student designed their registration system; the scheduler shows seat availability, travel time to class, warnings regarding prerequisites, waitlist, hold list if course not in major, pictorial grids, registers in real time, and gives catalog updates hourly.<br>• Student helpdesk run by students; media labs monitored by students.<br>• Founding member of Kuali with Berkeley and UBC; service oriented architecture (SOA); roll out in 5 years; open source will be able to customize functionality<br>• Want to add warning messages; flow messages reminding students of what they need to take.<br>• Portal will integrate systems.<br>• Translate system into Spanish; recommend using method other than auto-translate.<br>• Want more real-time services but have aging mainframes which means it is difficult to provide.<br>• Transcripts available after graduation using student ID. |

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| **University of Michigan** | • Highly customized Peoplesoft SIS system created in 2000; as one of the original users was very involved with Peoplesoft and the development of the system. They used their own interface. System includes class enrollment, advisor assignment, class schedule, and degree progress report; but does not include financial aid, housing, and dining.<br>• Because involved with Sakai and Peoplesoft early in development, it was easier for them to integrate the two systems; they are able to combine grades access across systems and offer course descriptions.<br>• Developed "back-pack," that acts like a shopping cart. Students select classes prior to registration date. When allowed to register, students just have to hit "submit" to find out immediately if enrolled. If not, students go back and select in real time.<br>• Very satisfied with Peoplesoft. Hired Accenture consultants to help with conversion and development of training materials. System change impacted students, staff, and faculty. Hired internal Change Management Consultants to conduct training sessions.<br>• Created new computing area with new staff positions–Business System Analysts–and continue to test and analyze systems.<br>• Build systems with long term in mind. Quantifying results is difficult.<br>• Realize the need to get more student input for future functionality. They are comfortable with what they have now, but know changes are coming.<br>• Working to integrate Sakai and Peoplesoft to create "what-if" scenarios so students could see what courses would be required if they were to take one major over another. Could also find out grades in one step and integrate course materials with SIS, once security issues are worked out.<br>• Want to tie in registration system with degree audit system. Students would be able to see at registration what courses are required for major to help in their course selection process.<br>• Input from administration and faculty: put money into implementation and training; believe in customized package systems; and strive to integrate systems.<br>• See open source as a way to gain flexibility.<br>• Considering social IT but many pieces to fit together. Customer management systems will allow for more social IT.<br>• Focus on getting students what they need. |

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| **University of Minnesota** | • Virtually all home-grown systems, with the exception of the registration system, which is a highly customized version of the Peoplesoft SIS.<br>• First to have web-based registration over ten years ago.<br>• One-stop for faculty, staff and students, featuring graduation planner for going to grad school and focus on financial literacy to educate students about taking on debt.<br>• Have offered services electronically for a long time; services are organized from a student's point of view.<br>• They study student usability of website.<br>• Suggestions/comments box on front page of website. Feature provides a lot of student input.<br>• Very student-centric; continuing to add services to help students.<br>• Recommended checking out Michigan State's advisor tools that are robust and easy-to-use.<br>• Students feel as if they are getting too many text messages and can't keep up with messages and costs.<br>• Decentralized with 14 different colleges. However if you give people the forum for discussion, and create opportunities for them to work on joint projects, they will come together. |

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| **University of Wisconsin** | • Because direction to develop a student portal came from the Provost it helped to break down the silo mentality. An advisory group was formed composed of department members. Group helped in the development of the portal.<br>• Students given access to portal prior to admittance so they can track their applications. This enables them to become familiar with the features of the portal prior to arriving at school. Students intending to attend are given email accounts and communicate with the university via email.<br>• One authentication for all services; not all services on one server.<br>• Offer webspace to students to create their own sites while giving them space to back up files.<br>• IT policy set by advisory group mentioned above; not dictated by IT.<br>• Communications department conducts surveys to determine how technology is changing and what the student needs are.<br>• Proprietary SIS has customization limitations.<br>• Working to integrate SIS into the portal to give the same look and feel.<br>• Considering outsourcing email but students would prefer university communications through university email service or snail mail.<br>• Providing a way for faculty to create their own websites and encouraging them to include a link rather than an attachment when sending information to students.<br>• Listening sessions: students come once a month before department's strategic planning meeting and give feedback regarding systems.<br>• Students randomly selected to test SIS; reward for doing so is early enrollment.<br>• For future: course guide for students and outside in real time with course descriptions written by faculty; including syllabi along with centralized bookstore with links to bookstores that carry required text. Design interface to be like Amazon.<br>• Considering an internal Facebook.<br>• Students would like centralized course evaluation.<br>• Positive side of social IT: it helps transfer students get acclimated and enables more interaction across campus. |

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| **Yale University** | • Created a course evaluation system based on student demand.<br>• Personal page; use SunGard Higher Education's Banner software, like UC Davis<br>• Created own online course enrollment system that is integrated with catalog.<br>• Students created yale.station.org, a web-based networking site. Works because of their small student population – 5,200 undergrads.<br>• Working on a centralized room reservation system to avoid having to go to many departments to find and reserve an available room.<br>• Would like to have a one-card system.<br>• Moving towards centralization, but there are 12 different colleges. |

## Appendix S. Emergent Themes from Peer Institutions

*Interviews with peer institutions revealed the following themes across schools. The schools whose input is included are the following: UC Davis, UC Santa Cruz, UCLA, UC San Diego, Carnegie Mellon, Duke, Harvard, Indiana, MIT, Stanford, University of British Columbia, University of Chicago, University of Maryland, University of Michigan, University of Minnesota, University of Wisconsin, and Yale.*

- Mobility is a top priority for students. Offer IT services anytime and anywhere. Wireless access throughout campuses is essential to student satisfaction.

- Build systems that are flexible, adaptable, expandable, student-centric, and easy to use. The look and feel of websites should be similar in appearance and navigation. Work toward centralizing to avoid redundant services and unnecessary duplication of data.

- Provide a central, one-stop website for prospective and newly enrolled students that will set the model for future IT experiences. If initial IT experience is smooth, a competitive advantage could be gained as prospective students are easily facilitated and not inhibited by the prospective-to-enrollment student process.

- Utilize customer relationship management systems to allow for targeted personalization of services. Consider modeling system interfaces like those used in commercial/retail sites, when feasible, to create student information systems that look familiar to students. Sites that look familiar will be easily adopted and used by students.

- Students are functionally adept but not necessarily technically adept. As the workings of IT are increasingly hidden, the students know less about how systems or computers work. Students will continue to need help navigating systems and addressing their computer problems.

- Student digital maturity does not necessarily correlate to emotional maturity. Students still need guidance and advice pertaining to academics; emotional and physical health; and their social lives. Universities providing this advice and support will help guide students to successful professional and family lives. In-person interaction is still an expectation of students.

- Student expectations change rapidly. Public schools are faced with increasing enrollments and limited resources. Operational efficiencies must continually be sought out while meeting the needs of the most number of people.

- Social IT. What is the impact for schools with a population that increasingly relies upon technology for social interaction? Is face-to-face interaction being avoided or are these services enhancing social interaction? Bringing technology and face-to-face social interaction together in comfortable lounge-like computer labs is a way that is being used and being considered. University facebooks are also being considered. Overall, however, schools believe these services are being sufficiently provided by commercial social networking sites and they would rather spend their resources on university-related IT services.

- Student involvement can be, and should be, utilized at many levels. Technology support and development, providing feedback through focus groups, surveys or advisory councils are methods schools use to remain in tune to student needs and expectations.

- The gap in expectations is increasing from year to year, making it more difficult to keep up. Only recently schools could plan their IT services for the next 4-5 years but now have to respond more quickly to rapid change occurring year to year. This creates the need to build systems that are flexible and can accommodate such rapid change.

- Students who prefer to use Gmail and Yahoo! often use the university email forwarding feature. This is problematic as their mail can be blocked as spam. Universities are considering outsourcing email services to companies such as Google, Yahoo!, and Microsoft, but in the meantime students are being held responsible for university-related correspondences. Can UC collaborate and negotiate to have email outsourced with UC extensions written into the address lines and filtering controlled by the university?

- The Berkeley campus and the other UCs share the same basic challenge of providing more services to more people with increasingly fewer resources. Decisions must be made that break down barriers to sharing resources and foster collaboration among departments and administration on campus. A similar concern must be addressed across the entire UC system.

- Vendors have the ability to add more flexibility to their systems and exclusive proprietary systems have their limitations for the university. It requires good vender relationships, persuasive skills, and acumen to collaborate effectively and give the ability to adapt to unforeseen changes that may not be entirely resolved through proprietary channels. Integrate proprietary systems such as Peoplesoft with open source systems such as Sakai instead of building new systems.

- Schools continue to work on offering richer content in enrollment systems, such as evaluations, syllabi, and course descriptions; offering textbook connections outside of the university bookstore; and building systems from the student, rather than administrative, perspective.