

# 21st Century Students: Technology Survey University of Minnesota Twin Cities

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J.D. Walker | Linda Jorn

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- A study of the effectiveness of video podcasting in combating student misconceptions
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- Emerging academic technologies
- Faculty development programs and consultation
- Evaluation and research
- Technology training
- Usability



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## INTRODUCTION

In this section, we provide information about how we constructed and distributed the student technology survey, analyzed the results, and produced this report.

Throughout the report are interspersed, in quotations, selected responses to the open-ended survey question, “Do you have any further comments regarding educational technology at the University of Minnesota?”

## Background

It has become common to refer to the American generation born after 1984 as the Net Generation, Generation Y, or the Millennial Generation, because these young people have lived their entire lives in a world which contains the Internet and many varieties of digital technology.<sup>1</sup> As members of this generation have arrived at universities and colleges, postsecondary educators have expressed great interest in understanding these students, particularly the ways in which they differ from previous generations of college students.<sup>2</sup> What are the expectations and experiences of Net Gen students, especially with respect to digital technology? How are their preferences, abilities, and learning styles different from those of previous generations? And how can digital technology best be used to enhance their education?

Since 2001, Office of Information Technology (OIT) staff members have been conducting an ongoing, longitudinal research project entitled “Understanding Our Students,” to help faculty, staff, and administration at the University of Minnesota answer these questions about Net Gen students. We are integrating data from several sources to construct a profile of University of Minnesota students’ experiences with, perceptions of, and preferences regarding educational technology. The sources include:

- large-scale surveys
- public panel discussions
- student focus groups

We also are tracking changes across time, as successive groups of students enter and leave the University.

In this report we present findings from one component of the “Understanding Our Students” project, namely the 2009 student technology survey, and analyze the results by considering data from past surveys, student focus groups, and panel discussions where appropriate.

## Purpose

Our overall objectives were to understand the relationship current University of Minnesota students have with educational technology, and to determine how educational technology is affecting their learning environment. Our belief is that this information will be useful for staff, faculty, and administrators in all colleges at the University of Minnesota, Twin Cities.

More specifically, we tried to evaluate:

- student use and ownership of technology
- student preferences about and perceptions of educational technology
- student problems using educational technology
- relationships between demographic characteristics of survey respondents and their answers to survey questions.

## Methodology

The survey contained 20 closed-ended and 4 open-ended questions. It was made available online from April 3, 2009 until April 27, 2009 to approximately<sup>3</sup> 5,721 students enrolled at the University of Minnesota, Twin Cities in spring 2009. The pool of survey recipients was obtained by drawing a random sample from the total student population, stratified by college.

The University’s Office of Institutional Research drew the survey sample, handled the mechanics of survey coding and scripting, and announced the survey to the recipients via e-mail.<sup>4</sup> In addition to a pre-survey notice and an initial announcement of survey availability, two follow-up messages were sent to recipients who had not yet completed the survey. A chance at winning one out of ten prizes was offered to survey respondents.

OIT staff members worked with the University’s Institutional Review Board to obtain student consent and to maintain the confidentiality of survey data.<sup>5</sup>

The 2009 survey was modeled on earlier surveys in this series, which were conducted by staff and faculty from the relevant colleges and staff from OIT:

- a survey of College of Human Ecology faculty members conducted in the spring through the fall of 2000<sup>6</sup>
- a multi-college survey of students from four colleges, conducted in the spring of 2001<sup>7</sup>
- a multi-college survey of faculty members from four colleges, conducted in the spring of 2002

- campus-wide surveys of students enrolled at the University of Minnesota, Twin Cities conducted in the winter of 2004 and in the spring of 2007.

The design, content, and implementation plan for the 2009 student survey were revised in accordance with the recommendations of Don Dillman’s tailored design method. This approach to survey research involves a systematic item writing and revision process and an implementation method that draws on the tenets of social exchange theory.<sup>8</sup>

Survey revisions were informed by several factors, including:

- item review by an advisory committee of experts in the faculty experience with digital technology from several units at the University of Minnesota, Twin Cities, including the College of Liberal Arts, the College of Education and Human Development, the Institute of Technology, and the Graduate School.
- an examination of 2007 survey results
- detailed cognitive interviews with University of Minnesota students
- reference to student technology surveys conducted at other institutions, such as the University of Michigan, the University of Georgia, Johns Hopkins University, and Southern Oregon University, as well as the EDUCAUSE Center for Applied Research (ECAR) 2008 Student Information Technology Use and Skills in Higher Education survey
- Application of principles from Bransford, Brown, and Cocking’s *How People Learn: Brain, Mind, Experience, and School*<sup>9</sup>
- Analysis of Chickering and Ehrmann’s “Implementing the Seven Principles: Technology as Lever”<sup>10</sup>

## Survey sample

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A total of 1,279 students responded to the survey, for an overall response rate of approximately<sup>11</sup> 22.40%, down somewhat from the 2007 response rate of 24.18%, but better than the 2004 response rate of 20.82%.

We collected demographic information for both survey respondents and survey nonrespondents to gain a sense of the ways in which the survey sample was representative of the student population as a whole.

As far as can be determined from the demographic data, the sample represents the student population fairly well. Some demographic differences existed between survey respondents and survey nonrespondents, but in every case the effect size, and hence the practical significance, of those differences is very small. However, in this report we do note, as appropriate, cases in which estimates of particular population parameters may be slightly biased by characteristics of our sample.

- graduate students were somewhat more likely to respond to the survey than undergraduates.
- respondents were older than nonrespondents, but only by approximately 1.29 years
- women were somewhat more likely to respond to the survey than men



## Characteristics of survey respondents

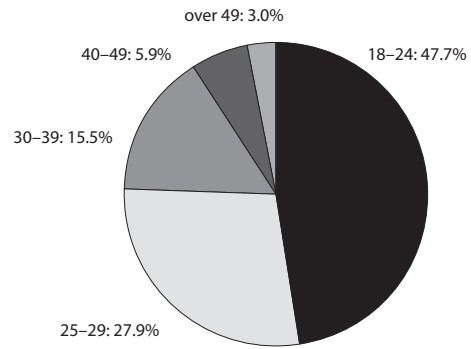


Figure 1: Survey respondents, by age

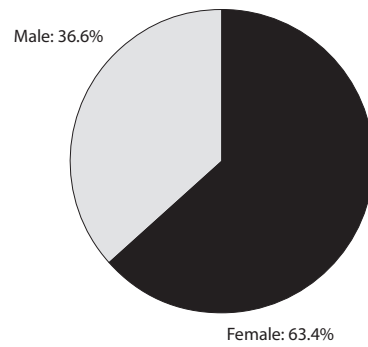


Figure 2: Survey respondents, by gender

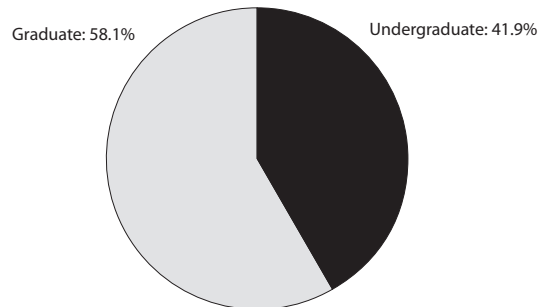


Figure 3: Survey respondents, by status

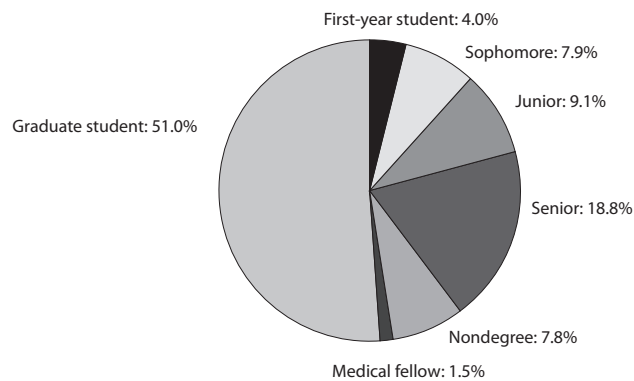


Figure 4: Survey respondents, by year in school

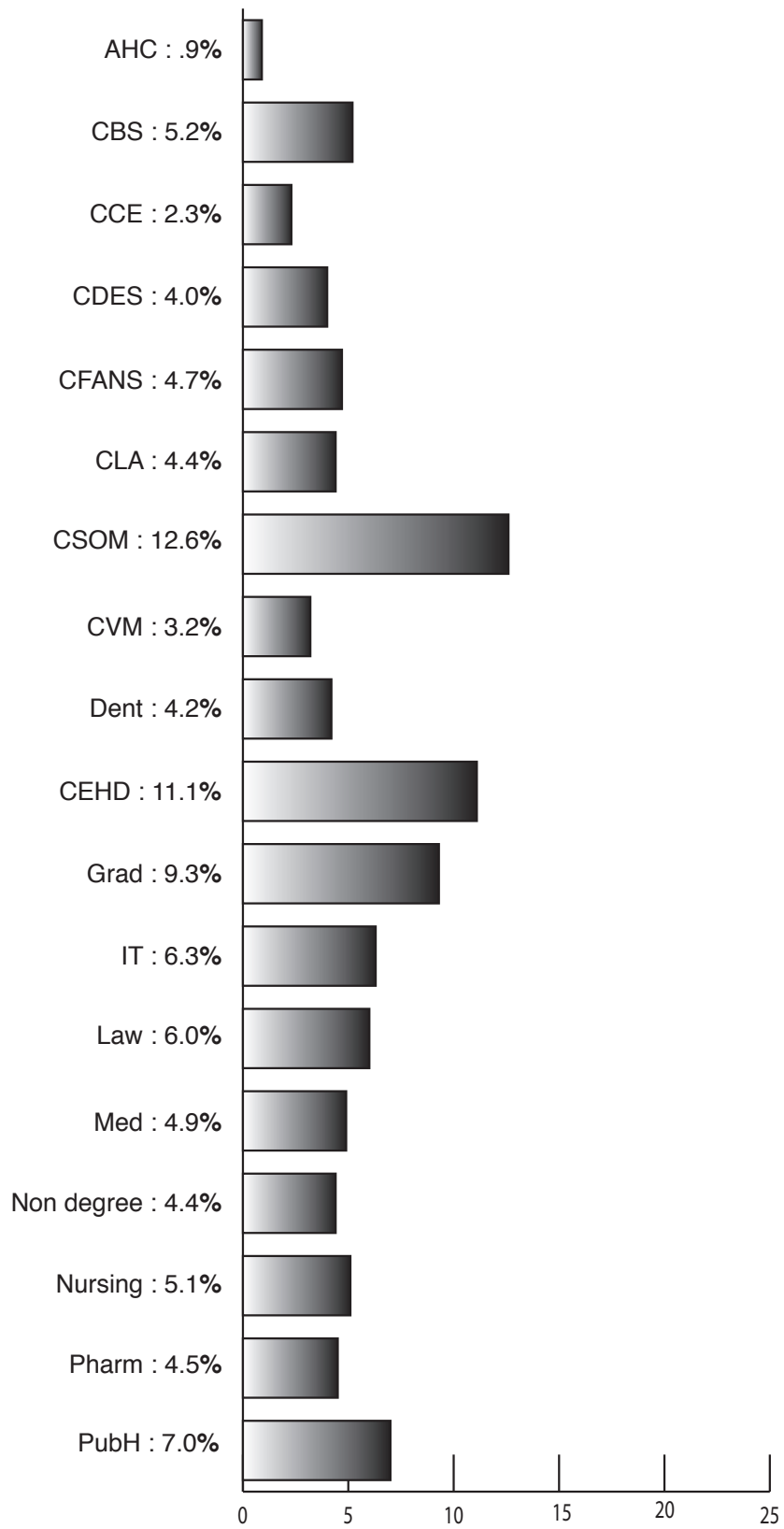


Figure 5: Survey respondents, by academic unit, percentage of total

## EXECUTIVE SUMMARY

In this section, we summarize the results of the survey, suggest implications these results may have for administrators, faculty and staff members, and students and describe our next steps. The summarized results are presented in further details in the Highlights section.

### Summary of highlights

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Faculty members, administrators, and instructional technology staff may wish to note an encouraging and persistent picture of the student experience with and attitudes toward educational technology. As in 2007, in spring 2009 U of M students:

- had strongly positive attitudes toward educational technology
- reported a low rate of problems in their use of educational technology
- were experienced with educational technology
- generally found educational technology useful in their coursework

#### Technology experience

When it comes to digital technology, the average University of Minnesota student is experienced but not sophisticated.<sup>12</sup> Students' experience is broad: 84.0% of University students have taken at least one course supplemented by online educational technology in the past two years; 42.1% have taken at least one hybrid course; 45.1% have taken at least one fully online course. The vast majority of students (75.2%) access online course materials at least two or three times a week, and 91.4% of students report experience using WebVista sites.<sup>13</sup>

But students' experience is not deep. Their experience typically has to do with simpler communication and presentation technologies, rather than with more sophisticated applications like media-manipulation software, graphics programs, etc.

#### Technology as information delivery device

As in 2007, students appeared to view educational technology primarily as a means for delivering information efficiently and in new, more convenient ways. Uses of technology that have to do with collaboration, interaction, engagement, or obtaining feedback were consistently ranked below uses that have to do with the nuts and bolts of academic life (preparing assignments, delivering content, etc).<sup>14</sup> A similar pattern emerges when students are asked about what technologies they find most useful in their coursework as well as what technologies they are most comfortable with.

#### Consumers not producers

Since the mid-21st century, Web 2.0 technologies like blogs and wikis have offered Web users the opportunity to shape their online world by creating, contributing to, altering, or commenting on the content of Web sites. Interestingly, only a small percentage of University students reported taking advantage of this opportunity; instead, the vast majority of students appeared to use online technology as consumers rather than as producers. For instance, despite the great popularity of YouTube, only 25% of students have ever uploaded a video to the Internet, and only about 5% upload a video more than once a month.<sup>15</sup>

#### Technology in classes

As in previous years, students strongly supported the use of a moderate to large amount of technology in their classes.<sup>16</sup> Their preference for fully online classes was much weaker, indicating a desire to retain some degree of face-to-face contact with their instructors.

Students did, however, insist that educational technology should be used in constructive ways: instructors not using educational technologies well was the second-highest ranked barrier to students' use of technology in their classes. What students mean by "well" appears, however, to be tied closely to the idea of using technology to deliver information, and to students' focus on tests and examinations. When students were asked how instructors could improve their uses of technology, their answers leaned strongly in favor of using technology to provide PowerPoint slides or professors' lecture notes online for class make-up or exam review.<sup>17</sup>

#### Mobile technologies

There was very strong support among students for the use of mobile technologies. Large majorities report owning cell phones, laptops, and digital audio players, and nearly all students who do not currently own these devices would like to own them. Personal digital assistants, smart phones, and "netbooks" form a second, and noticeably less popular grouping, although the percentage of students who own and who aspire to own smart phones has jumped dramatically since 2007, possibly in reaction to the introduction of the iPhone.<sup>18</sup>

#### Technology fees

Most University students paid a technology fee in 2009, but a series of questions about these fees revealed a distinct lack of knowledge about them. Over 83% of students who paid a technology fee knew that they paid something, but a substantial majority (nearly 60%) did not know the amount of the fee. Very few students (<20%) knew who manages their tech fees or how to get involved in the process if they wanted to, and even fewer students (about 10%) said they

know a lot or a moderate amount about what their fees are spent on.

### Age

In 2004, older students tended to be less happy with educational technology than younger students were. Older students had less experience with educational technology, were generally less comfortable with it, and found it harder to learn. In 2007, the relationship between age and educational technology attitudes, comfort levels, etc. had weakened, possibly for the simple reason that the younger students in 2004 were three years older.

Data from the 2009 student technology survey continue the trend begun in 2007. It was striking, in fact, how few differences there were between older and younger students in 2009. Counter to some stereotypes, age was not a significant predictor of comfort levels, perceived usefulness of technology, desire for technology in classes, problems with technology, or mobile technology ownership.

### Gender

Unlike in 2004, when there were few differences apparent between genders, the 2009 survey continues a pattern of gender differences regarding technology which was established in 2007. The pattern is difficult to summarize succinctly, but it does not fit the stereotype according to which women are technophobes and men are technophiles.

Men and women reported similar attitudes toward technology used in their education, similar desires with respect to the amount of technology they would like in their classes, and nearly identical preferences with respect to online versus face-to-face classes. But, while women reported greater experience than men in taking courses that

use technology, they also reported lower overall comfort and skill levels and more severe technical problems. It is not clear whether these differences were veridical or merely artifacts of gendered response patterns: men may be inclined to over-report their own skills and comfort and to under-report problems.

## Trends over time

The identification of changes in the University of Minnesota student population over time is one of this series of technology surveys' goals. While methodological breaks and changes in survey content prevent some comparisons with data from earlier surveys, in this report we highlight interesting points of comparison across time in an informal way, noting methodological problems where appropriate.

Overall, student attitudes toward, perceptions of, and comfort levels with educational technology are much the same as they were in 2004 and 2007. Then, as now, students reported strongly positive attitudes, low rates of problems, and high comfort levels using digital technology in their education.

### Experience with online educational technology

Students' reported levels of experience with educational technology have changed, however. The percentage of students who report having taken at least one course supplemented by educational technology is largely unchanged since 2004, but for fully online courses, this percentage has been increasing steadily since 2001. (See figures 6 and 7.)

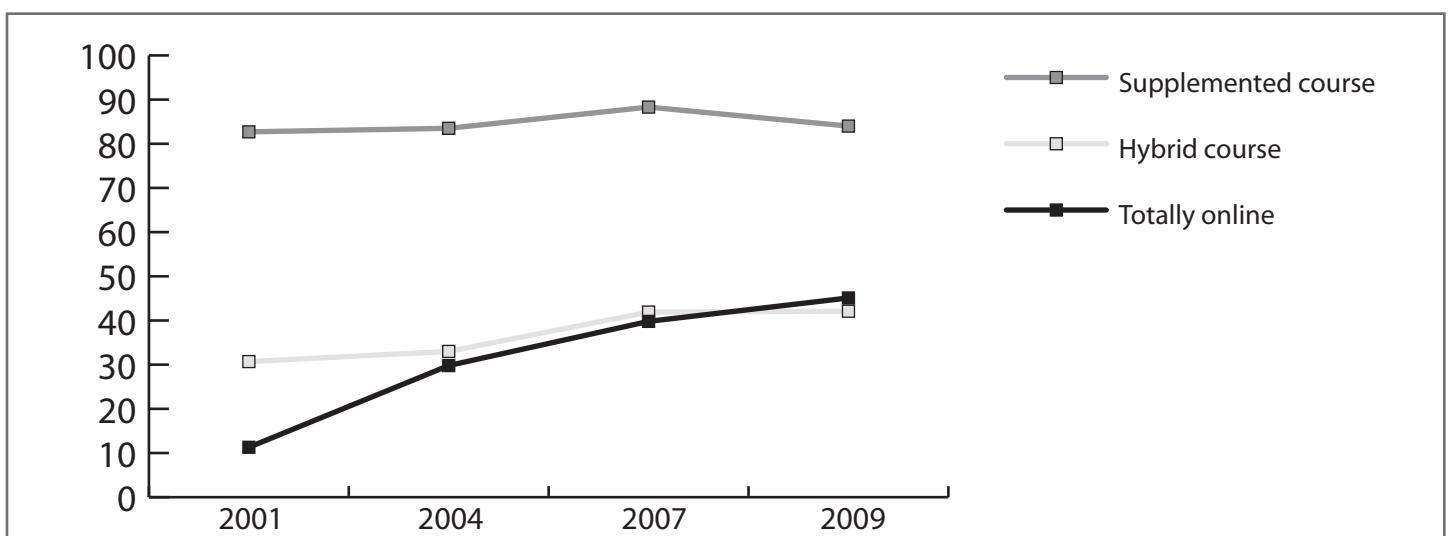


Figure 6: Students who have taken at least one technology enhanced course, by percent

## The iPhone effect

When patterns of technology ownership change over time, a very common motif is simply that people who aspire to own the technology, obtain it. For instance, student ownership of audio players and laptops is up about 10% since 2007, and that 10% has come entirely from the “don’t own, but would like to” category. It is not the case that more people are attracted to these things than were in 2007 – the market has not expanded – but, the ones who wanted them, have gotten them.

Sometimes, however, a technology is introduced that has strong effects on an entire market segment. Apple’s iPhone appears to be such a technology. The iPhone was introduced in early 2007 and was, therefore, not mentioned in the 2007 student technology survey. At that time the potential market (the number of current owners added to the number of aspiring owners) for smart phones was only 42.4%. In 2009 the potential market had increased by over half to 67.8% (see data for Question 3, below). The number of students who own smart phones had quadrupled, and the number who wanted to own them had increased substantially as well, indicating that many students moved from the “don’t want to own” category into either ownership or potential ownership. A reasonable hypothesis is that the iPhone helped to increase the size of the potential market by over 50%.

Interestingly, the iPhone may have had effects on the market for other technologies as well. The percentage of students who reported owning PDAs and regular cell phones declined between 2007 and 2009, possibly because the iPhone duplicates their functionality. (See figure 8.)

## Students and faculty

The 2009 faculty and student technology surveys differed in ways that reflect the different relationships which faculty and students typically have with educational technology. Several questions on the surveys were very close in form and content, however, permitting reasonable comparison of faculty and student responses.

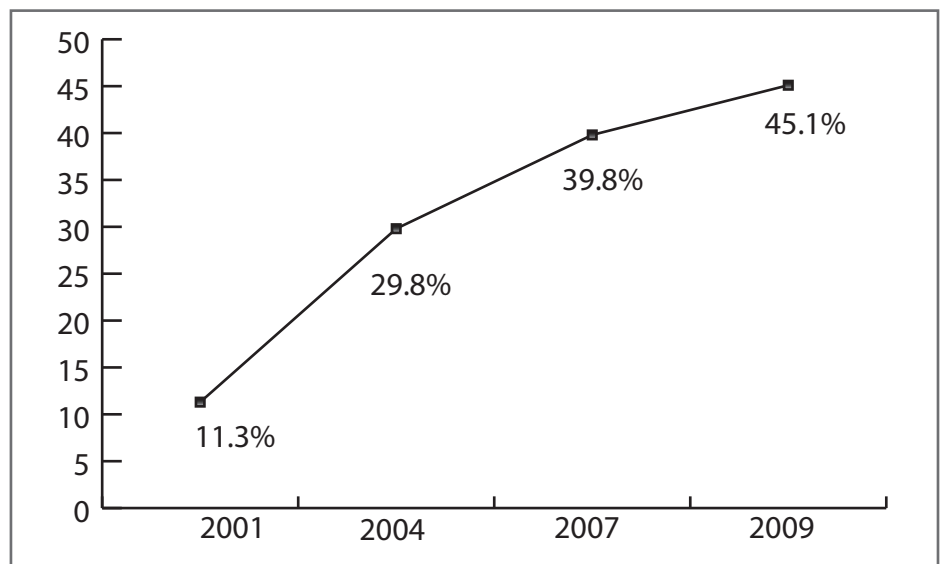


Figure 7: Students who have taken at least one online course, by percent

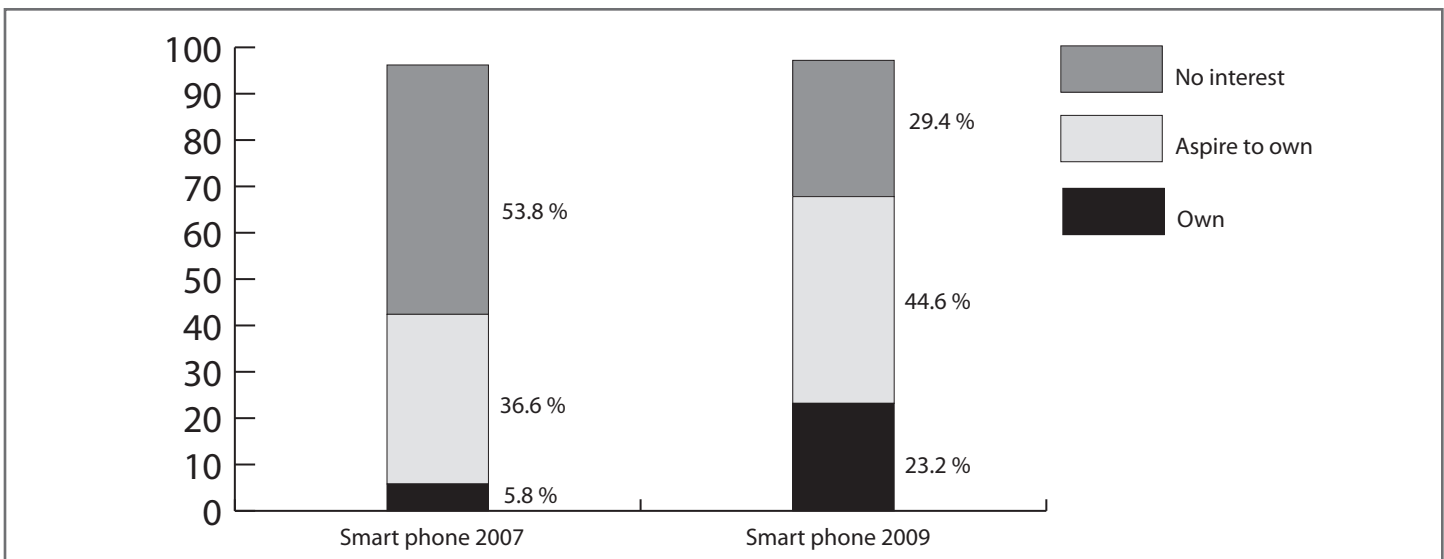


Figure 8: Student ownership of smart phones, by percent

## Online courses

Students and faculty were both asked about their preferences for taking/teaching fully online versus face-to-face courses, using a five-point, two-sided scale from strongly prefer online to strongly prefer face-to-face.

The results indicate that faculty and students are in broad agreement on this issue: they have strong preferences for the face-to-face environment, with 77.6% of faculty and 64.0% of students somewhat or strongly preferring face-to-face courses. The faculty preference is particularly pronounced, with nearly 58% of faculty strongly preferring face-to-face courses. These numbers are consistent with the finding from the 2004 and 2007 technology surveys that both faculty and students want to retain at least some degree of face-to-face contact in the educational process. (See figure 9.)

A related finding was that students' and faculty members' experience with online courses – taking them or teaching them – was correlated with preferences about class format. If a student or faculty member had taken or taught at least one fully online course, he or she was significantly more likely to prefer such courses. Great divergence between those with online experience and those without it was apparent at one end of the preference scale: faculty and students who lacked online course experience were far more likely to say they strongly prefer the face-to-face format. (See figures 10 and 11.)

What is unclear, and cannot be determined from the survey data, is the direction of the causal arrow. Does taking/teaching an online course cause a person to prefer the online format? Does liking the online format better cause a person to be more likely to take an online course? Or both?

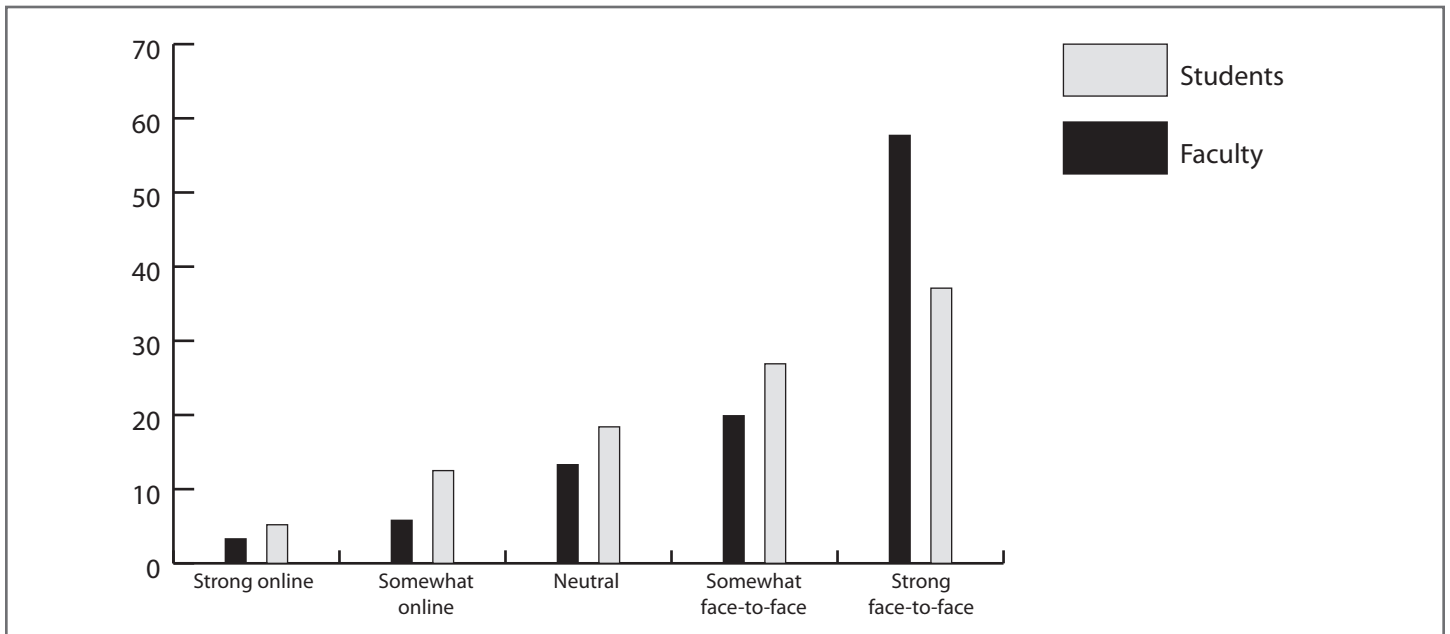


Figure 9: Student and faculty preferences for online vs. face-to-face courses

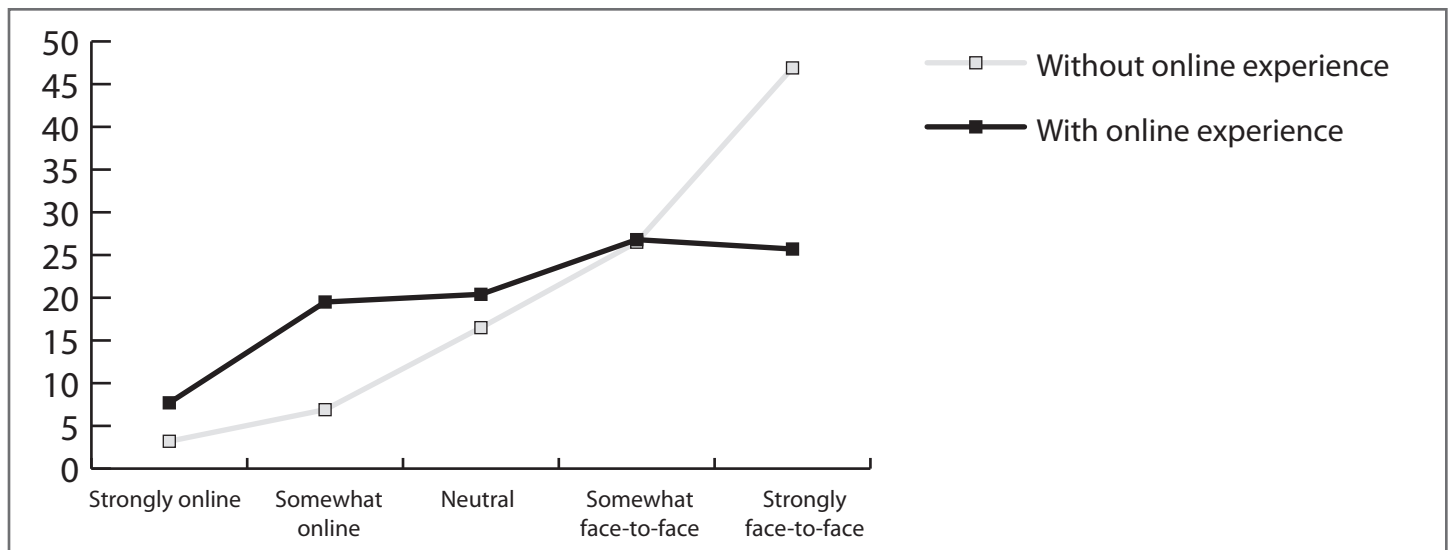


Figure 10: Student online course experience and preferences

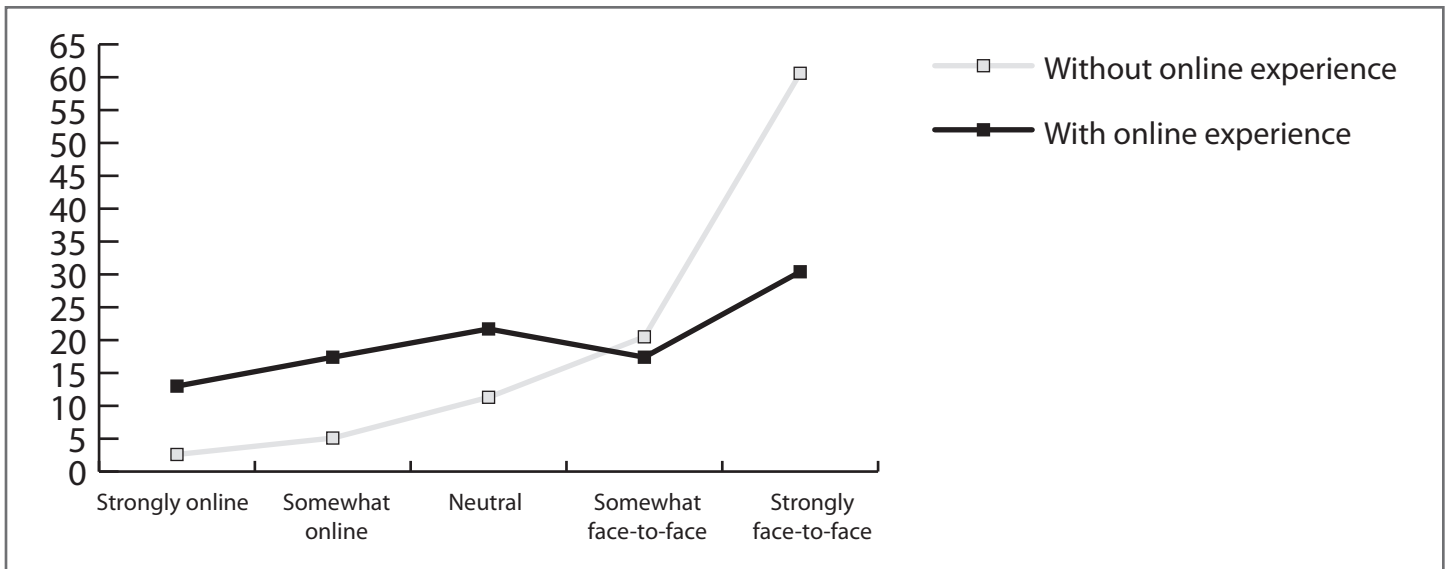


Figure 11: Faculty online course experience and preferences

### Class capture technology

Students and faculty were both asked about their degree of interest in three types of class capture technology, with answers provided on a four-point scale. Two features of the results are of interest.

First, both faculty and students have a preference for video. The numbers for class capture involving video are about twice as high, both for faculty and for students, than the numbers for audio-only captures.

Second, students want class captures (of all sorts) nearly twice as much as faculty do. Just above 40% of faculty said they were very or moderately interested in the most popular form of class capture, while the student numbers for both types of class capture involving video were between 75 and 81%.

This finding could result from the fact that, for students, there is no cost associated with class captures; the captures are just another technology which students can use for class preparation, exam review, etc. Past and present technology surveys have shown, by contrast, that faculty have concerns that may affect their attraction to class captures, such as the worry that students may not come to class if they have access to class captures, concerns about intellectual property, worries about learning how to implement and use another technology, and so forth. (See figure 12.)

### Digital distractions

Students and faculty were asked in near-identical questions to comment on the in-class use of digital technology by students for purposes that may or may not be related to the class itself (e.g., sending text messages, checking social networking sites like Facebook). Their responses differed in interesting ways, many of which reflected the different perspectives the two groups have on the classroom.

For instance, students could speak easily to the effects (or lack thereof) which their classmates' technology use had on them, while faculty members were usually limited to speculation on this matter. Students' responses accordingly focused on the issue of whether in-class technology use does, in fact, distract other students.

Faculty members, in contrast, are, by default, in a position of authority in the classroom and were much more concerned than students with the symbolic message of in-class technology use. The belief that in-class technology use is rude, disrespectful, insulting, etc. was much more prominent in the faculty than in the student responses.

Certain themes were evident in both sets of responses, such as the thought that students who text in class will only have themselves to blame when their learning suffers, and the idea that students only use digital technology in class when their instructors fail to engage them sufficiently.

## Recommendations

On the basis of this report we offer the following recommendations for faculty, staff, and administrators at the University of Minnesota, Twin Cities.

### Incorporate digital technology into teaching

Most students are comfortable with digital technologies and can learn new technologies without much trouble. The use of varied media is particularly popular. However, students are critical of gratuitous uses of technology. Instead, it should be used in well-considered, constructive ways, and should help students in a time-efficient way with the academic tasks before them.



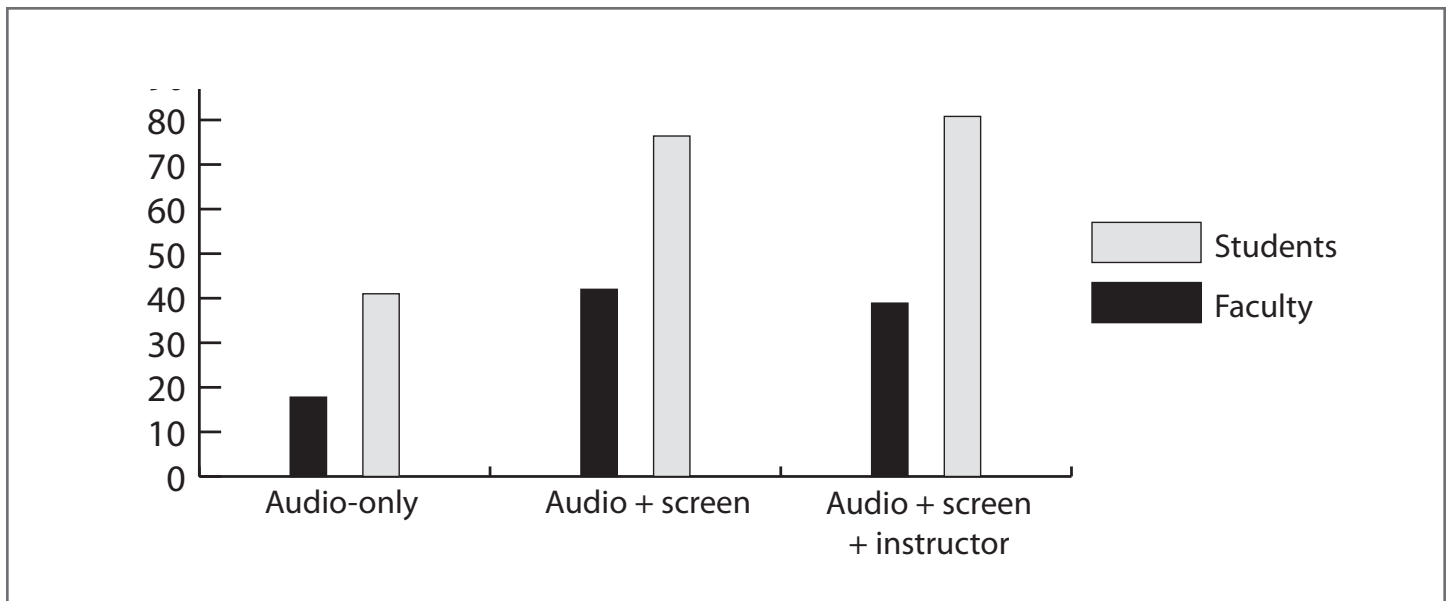


Figure 12: Faculty and student preferences for class capture

### Use technology for more than information delivery

Although many students think of education primarily as accumulating factual knowledge, they will accept more innovative uses of technology which are well-designed and explicitly connected to class goals. Constructive uses include enabling student-student interaction, giving students feedback on their learning, and providing tools for visualization and simulation.

### Encourage active uses of technology

Students will tend to be passive in their approach to online technology but will accept more active uses if such engagement is well-integrated into their academic lives.

### Approach social networking cautiously

The vast majority of students use social networking technologies, but they greatly value keeping their academic and personal use of those technologies separate. Instructors and administrators should take this fact into account and take great care when thinking about whether and how to leverage these technologies in the academic environment.

### Consider addressing digital distractions in the classroom

If an instructor wishes to take steps to minimize instructionally irrelevant uses of digital technology in the classroom, he or she will be supported by a significant percentage of students. Even students who themselves surf the Web or text in class often express the wish that they would not do so, in order to get more out of class sessions.

### Provide technical support

Though they learn new technologies easily, students are not technical sophisticates and will sometimes need help.

Given students' busy schedules and exploratory learning styles, they will appreciate support that is available on demand and at all hours. Instructors may want to consider making links available to such things as software usage guides, troubleshooting information, and helpline phone numbers on a course Web site. Training sessions should be limited to brief orientations.

### Leverage mobile technologies

The immense popularity of cell phones, mp3 players, and laptop computers means that most students are well-prepared for the integration of these devices into their education. The large percentage of students who aspire to own smart phones should be noted as well. Meanwhile, no amount of wireless connectivity is too much for University of Minnesota students.

### Next Steps

We plan to survey students in all colleges at the University of Minnesota, Twin Cities every two years, an approach which will allow us to continue to gather longitudinal data about changing patterns in students' experience with and attitudes toward educational technology. This information should prove helpful for the administration and delivery of technology-enhanced learning programs of all sorts.

The student survey is being supplemented by a series of student focus groups, interviews, and public panels that explore issues surrounding educational technology. Our hope is that data from these sources, along with this survey, will help administrators and others to form a comprehensive picture of student use of educational technology at the University of Minnesota.



## HIGHLIGHTS

In this section, we present and analyze student responses to selected survey questions.

We report the mean of means where appropriate. This statistic represents the average rating given by all survey respondents to all the items in that question. For example, the mean of means for Question 13 (“How useful have each of the following technologies been to you in your course work?”) is determined by taking the mean score for each item in the question (e.g., “WebCT course Web site”, “Blogging tools”), and averaging all such mean scores.

The expected mean of means for a 4-point scale is 2.5. If the mean of means for a given question is above 2.5, that indicates strong overall responses to the items in that question. If the mean of means is below 2.5, that indicates weak overall responses.

We also display the highest- and lowest-ranked items for each question, as determined by mean score. The number of items in the highest/lowest sets was determined by natural breaks in the data, e.g. three items that were noticeably above or below the mean of means for that question. Where there are no natural breaks, we have tried to provide as much of the data as possible.

Finally, we provide information about the distribution of responses where appropriate. The range of mean scores for a question indicates how tightly or loosely clustered students’ ratings of the items in the question were. For instance, a wide range (as found in Question 13) indicates that students found some of the technologies listed much more useful in their coursework than others.

## Anticipated laptop resources

### QUESTION 1

How often do you access online course material?

Scale: 8 = More than once a day; About once a day; Two or three times a week; About once a week; Two or three times a month; About once a month; Two or three times a semester; 1 = Almost never

#### Data

See figures 13 and 14

#### Analysis

Overall, students appear to be accessing online course materials less often in 2009 than they did in earlier years.<sup>19</sup> For instance, the percentage of students who report accessing online course materials at least once a day is lower than the comparable percentages from both 2007 and 2004. This is interesting, in light of data indicating that

respondents to the 2009 survey took the same number (or more) of courses using online technology than respondents to earlier surveys did (see Question 8).

However, the broad experience with online materials is reflected in the fact that the vast majority of students (over 75%) report accessing such materials at least 2 or 3 times per week.

### QUESTION 2

Do you ever use U of M computer labs?

#### Data

See figure 15

#### Analysis

While a substantial proportion of University of Minnesota students say they never use University computer labs, this number has remained largely flat since 2007, when it was 39.7%.

That nearly 2/3 of University students report using computer labs is interesting in light of the enormous percentage of students who say they own laptop computers (89.1%; see Question 3). Given recent efforts to extend wireless access across campus, one might reasonably think that personal laptop use would supplant computer labs. However, anecdotal evidence suggests that students find it burdensome to carry their laptops with them across campus, which may create a niche of convenience for computer labs.

### QUESTION 3

Which of the following portable devices do you own, and which would you like to own?

#### Data

See figure 16

#### Analysis

As in 2007, there was very strong support among respondents for the use of mobile technologies. Large majorities report owning cell phones, laptops, and audio players, and most students who do not currently own these devices, would like to own them.

The bars on the nearby graph are arranged in increasing size of the ‘potential market’ for these technologies, which is the number of current owners added to the number of aspiring owners. The graph shows interesting differences between very popular technologies. For instance, the vast majority of students own cell phones and laptops, but while the market has topped out for cell phones, it has not yet peaked for laptops — nearly all of the 11% of students who do not own laptops want to own one.

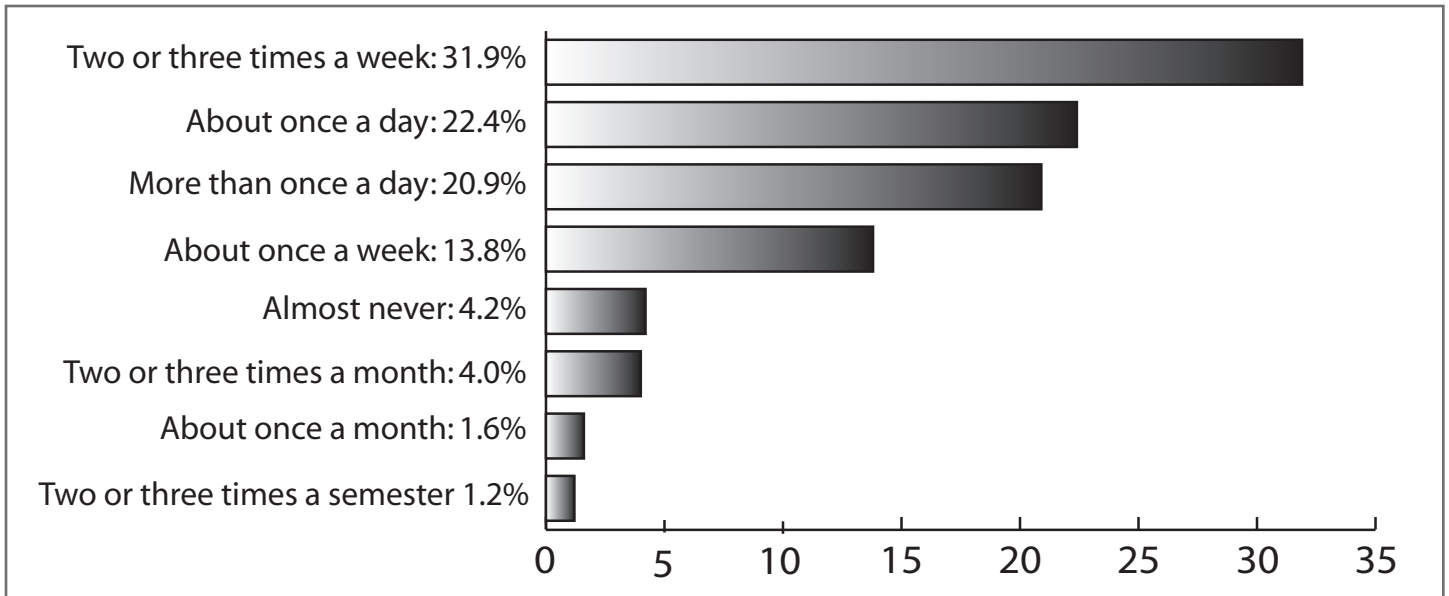


Figure 13: Frequency with which students access online course materials, by percent

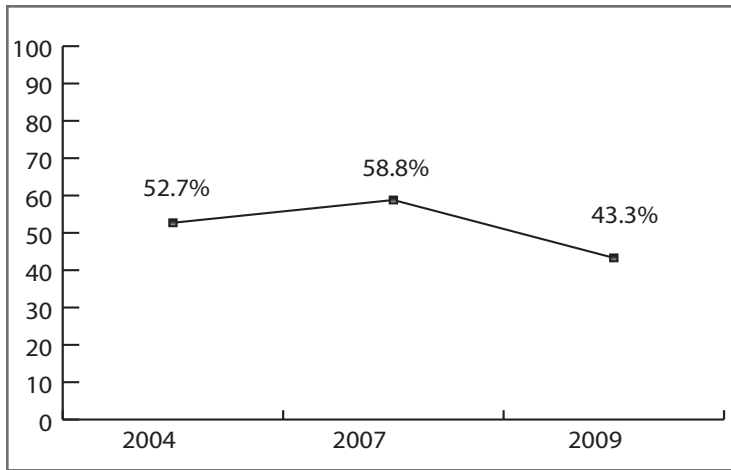


Figure 14: Percentage of students who access online course materials at least once per day

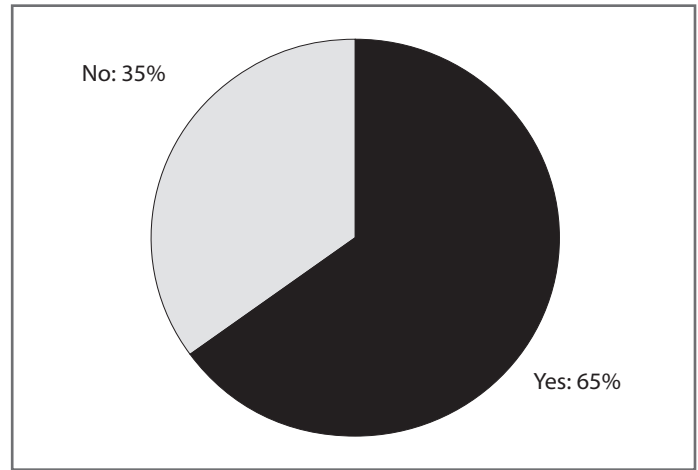


Figure 15: Percentage of student who use University of Minnesota computer labs

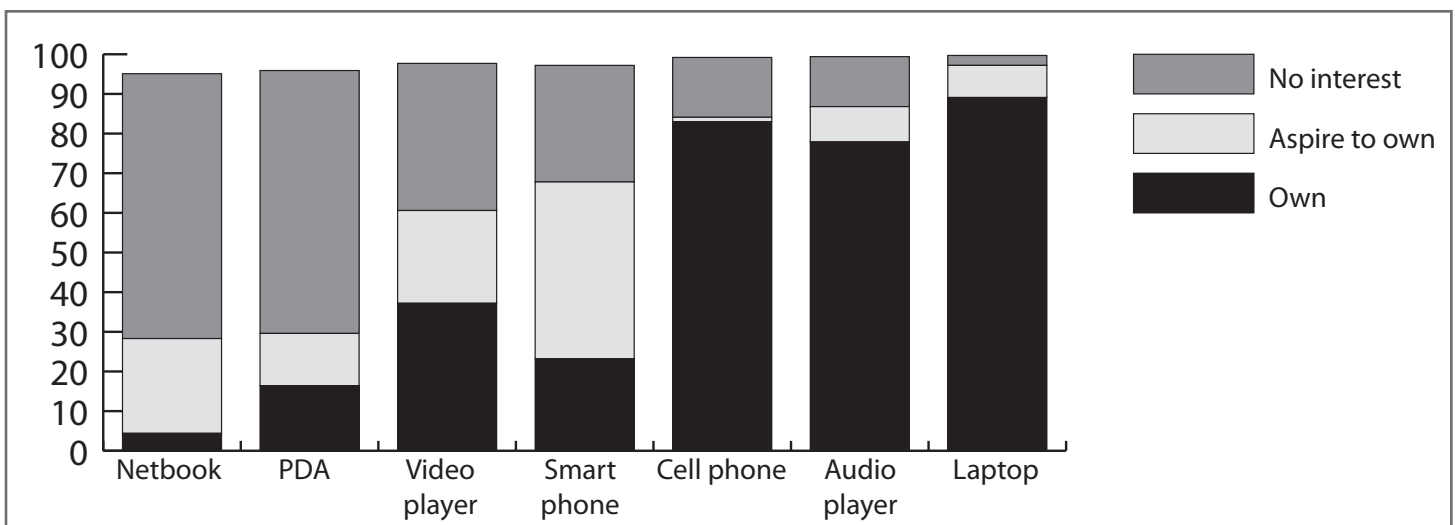


Figure 16: Students ownership of mobile devices, by percent

In a continuation of another pattern from 2007, PDAs are far more popular among students in the professional schools<sup>20</sup> than among other University students. Professional students are much more likely to own PDAs and smart phones than other University students (30.3% as against 9.4%; 30.7 vs 20.1). About 41% of all professional students either own a PDA or want to, as compared to 25% of students outside the professional schools. These results may reflect efforts within the professional schools to incorporate PDAs into their curricula.

**QUESTION 4**

How much would you be willing and able to pay in monthly connection charges for a mobile device such as the ones listed in the previous question?

**Data**

See figure 17

**Analysis**

Perhaps reflecting increased financial pressures in higher education, the vast majority (nearly 3/4) of students report being willing and able to pay only the lowest amount mentioned in Question 4 on connection charges, namely \$25 per month or less.

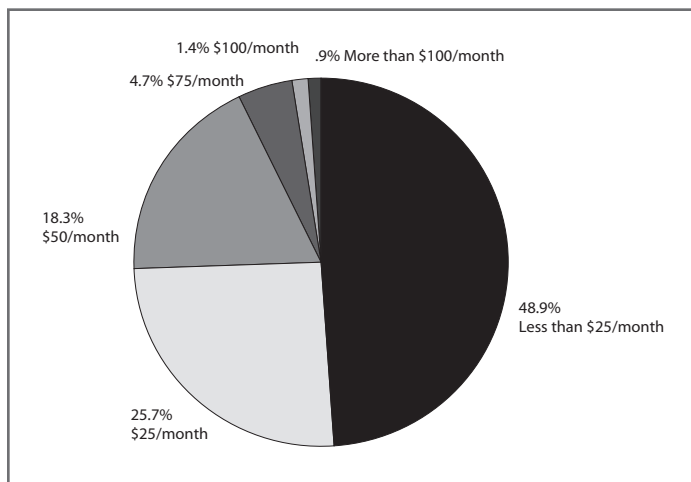


Figure 17: Students willingness to pay connection charges for mobile devices

**QUESTION 6**

Many contemporary Web-based technologies allow users to participate actively in the creation of online content. About how often do you do each of the following?

**Data**

See figure 18

**Analysis**

In recent years there has been much excitement in popular media and in higher education about so-called Web 2.0 technologies, namely applications that have the potential to change the Web user from a passive recipient to an active participant in creating the online environment—wikis, blogs, podcasts, and so forth.

Question 6 attempts to examine the Web 2.0 phenomenon by asking students how often they are active on the Web using technologies like wikis and blogs. The responses are quite striking. The nearby graph shows the percentage of students who say they never engage in the listed activities, and it indicates that about 70% or more never create or contribute to wikis, blogs, podcasts, etc. Even for an application as wildly popular as YouTube, over 75% of students have never uploaded a video, and only about 5% upload a video more than once a month. The one thing most students have done is upload photos (almost 70% have), with a large amount of that activity probably occurring in Facebook.

The data for this question are consistent with a strong finding from the 2007 student technology survey, namely that students are, for the most part, passive and consumerist in their use of educational technology.

---

*“What is the 1% rule? It’s an emerging rule of thumb that suggests that if you get a group of 100 people online then one will create content, 10 will “interact” with it (commenting or offering improvements) and the other 89 will just view it.”*

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- Charles Arthur, July 20, 2006, *The Guardian*

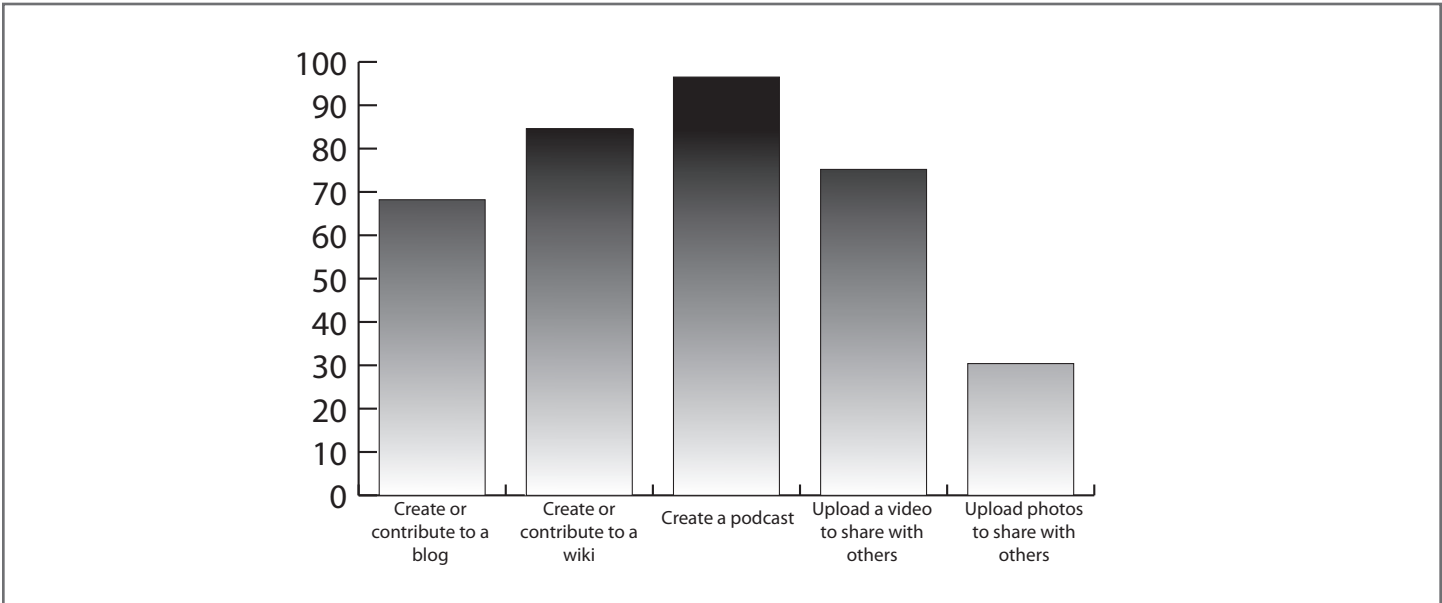


Figure 18: Percentage of students who report never engaging in the listed activities

### QUESTION 8

Online educational technology can be used in any of the following three ways:

- \* to support a course delivered totally online;
- \* to replace some face-to-face time with time spent working online;
- \* to supplement an unchanged face-to-face course.

Approximately how many courses (including your current courses) have you taken that were delivered in each of these ways?

Scale: zero = 1, 1-5 = 2, 6-10 = 3, More than 10 = 4

#### Data

See figure 19

#### Analysis

As in previous years, in 2009 University of Minnesota students continued to report high levels of experience with courses that use online educational technology. 84% of students indicated having taken at least one course supplemented by online technology, and over 45% say they have taken at least one fully online course.

As described in the “Trends over Time” section above, the numbers for fully-online courses describe a smooth upward trend since 2001, while the numbers for the other two categories of course in this question – hybrid and supplemented courses – appear to be flattening out. In particular, the percentage of students who have taken a course supplemented by online technology may have hit a ceiling in the 80-90% range.

## Preferences about and perceptions of educational technology

### QUESTION 9

Many universities are considering increasing the number of courses they offer fully online. What is your preference about taking fully online as opposed to face-to-face courses?

#### Data

See figure 20 and 21

#### Analysis

A strong finding in the 2007 student technology survey was that students desire at least some face-to-face component to the classes they take. These data confirm that finding, by showing that if choosing between face-to-face and fully online classes, students overwhelmingly prefer the former. 64% strongly or somewhat prefer face-to-face classes, and over 37% strongly prefer such classes.

Student responses to this question were strongly correlated with their experience with fully online courses. Among students who had taken at least one fully online course, 27.2% said they strongly or somewhat preferred online courses, as compared to 10.1% of students without online course experience. However, even among students with online course experience, 52.5% somewhat or strongly preferred face-to-face courses.

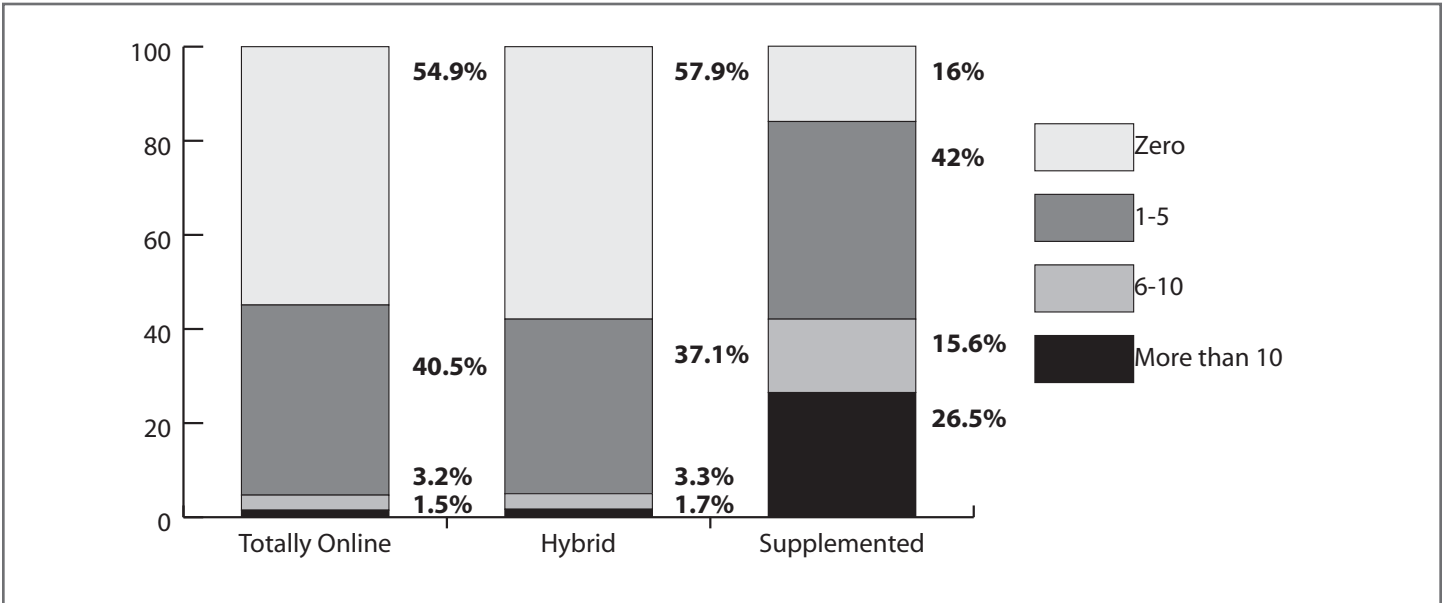


Figure 19: Number of technology-enhanced courses taken, by percent

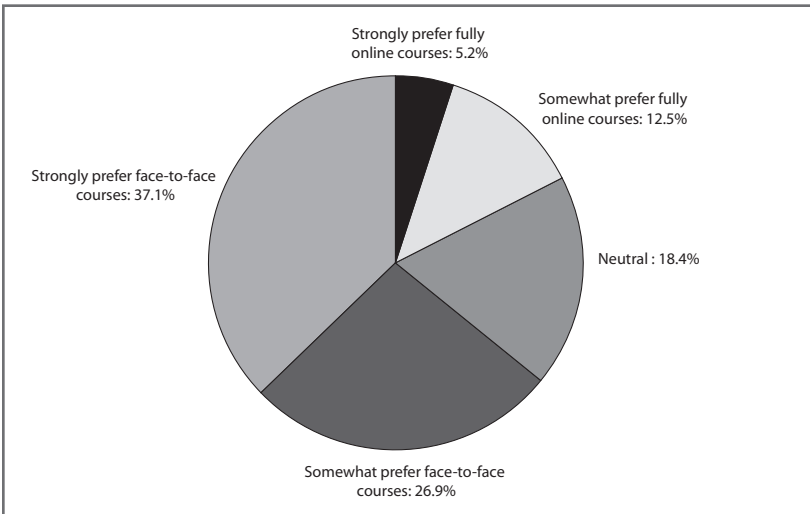


Figure 20: Student preferences toward online vs. face-to-face courses

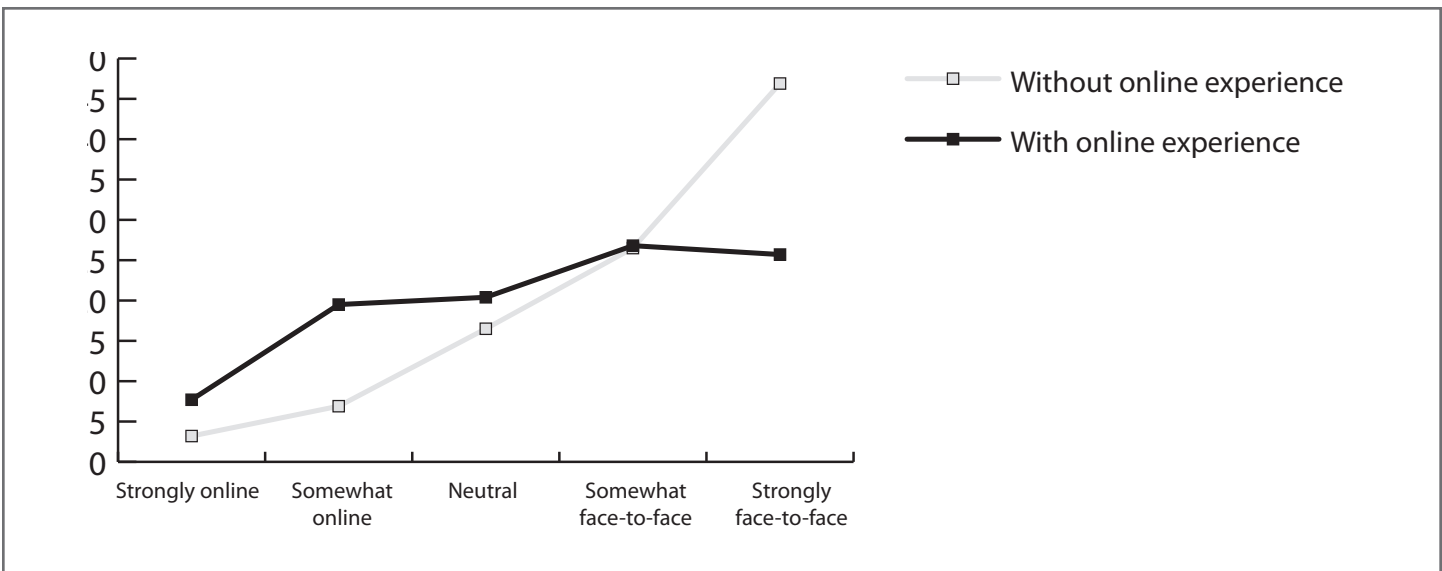


Figure 21: Student online course experience and preferences

### QUESTION 10

Technology units on the University of Minnesota campus are currently exploring “class capture” systems which record and make available online the audio and/or visual components of a face-to-face class. How useful would you find it to have available, for the classes you take, each of the following types of class capture materials?

Scale: Very useful = 4, Moderately useful = 3, Slightly useful = 2, Not at all useful = 1

Means: 2.71 3.36 3.55

#### Data

See figure 22

#### Analysis

This question asked students about an increasingly popular technology resource in higher education, namely class capture systems. This technology resource records and makes available online the audio and/or visual components of a face-to-face class. Interestingly, although it is unclear how many students have actually encountered such systems, they do have definite opinions about them – the percentage of respondents who answered “don’t know” was only approximately 5%.

One thing that is immediately apparent (and which was a theme in the 2007 student technology survey), is the student desire for video. The combined “not at all” and “slightly” numbers for the audio-only option are 59%, while for both of the video options, this figure is much lower: 23.6% and 19.2%.

The big division in students’ minds, then, is between audio-only and video-involving class captures. However, students also prefer the third option – which included video of the instructor – by a substantial margin, as indicated by the means for the two options. In addition, the percentage of students who regard option (b) as “very useful” is much smaller than the corresponding percentage for option (c), 38.6% vs. 52.8%.

### QUESTION 11

Educational technology is designed to improve the learning experience for students in a variety of ways. Please rate each of the following statements about the role educational technology has played in your learning experiences at the University of Minnesota.

Scale: Strongly agree = 4, Agree = 3, Disagree = 2, Strongly disagree = 1

Mean of means: 2.84

Range of means: 0.76

#### Data

See figures 23 and 24

#### Analysis

The consistency in the student experience with educational technology emerges clearly in the responses to this question.<sup>21</sup> As in 2007, 2004, and 2001, students express strongly positive attitudes toward educational technology overall, which are reflected in the high mean of means for this question. The question includes two broad items which ask students to think generally about the effects technology has had on their educational experience (“The advantages gained by using educational technologies outweigh the disadvantages” and “In general, educational technology has helped me to succeed in my coursework”), and both of these items received very high ratings.

Consistency is also evident in the fact that the highest mean ratings are associated with the same four items as in 2007, which are the same items that were highly ranked in 2004 (although they are ranked in a slightly different order). Furthermore, the five lowest-ranked items are exactly the same as in 2007 (again with slightly different ordering).

As in 2004 and 2007, students’ tendency to view educational technology as a means for delivering information and for dealing with the mechanics of education can be seen in the responses to this question. The items which have to do with the nuts and bolts of academic

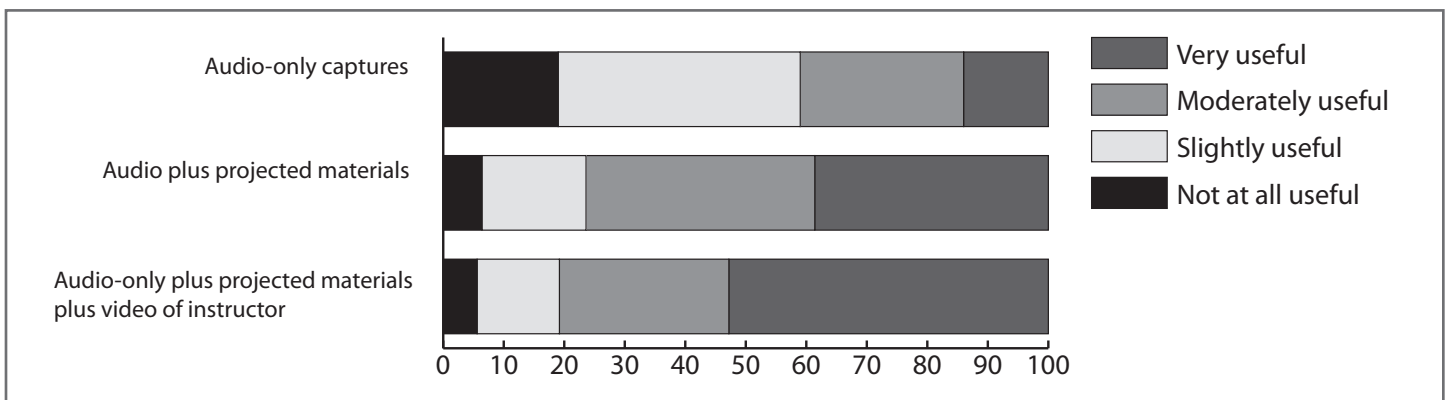


Figure 22: Student preferences for class-capture technologies, by percent

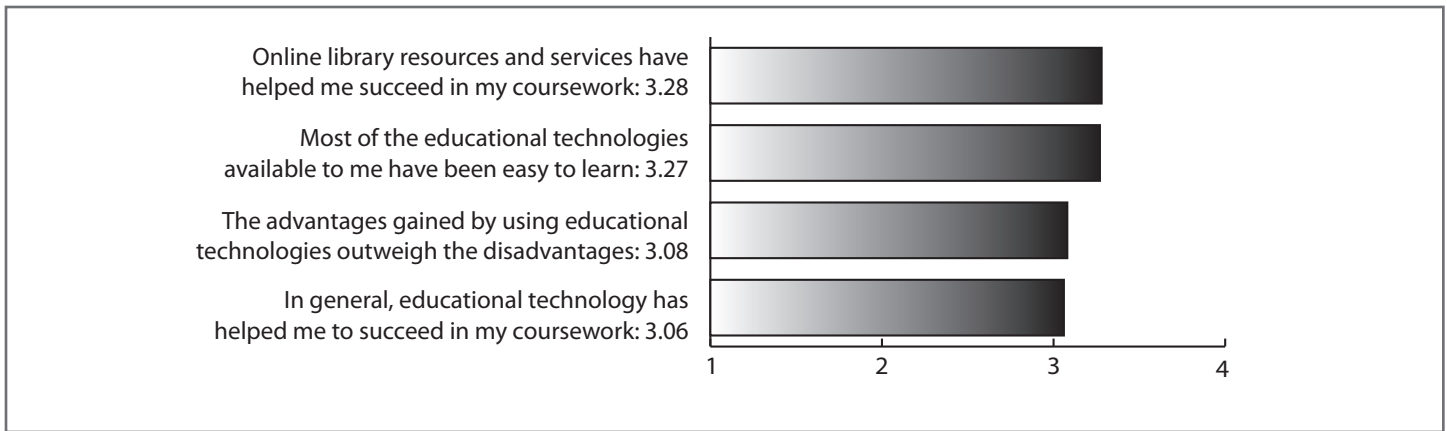


Figure 23: Highest ranked statements about technology, by mean

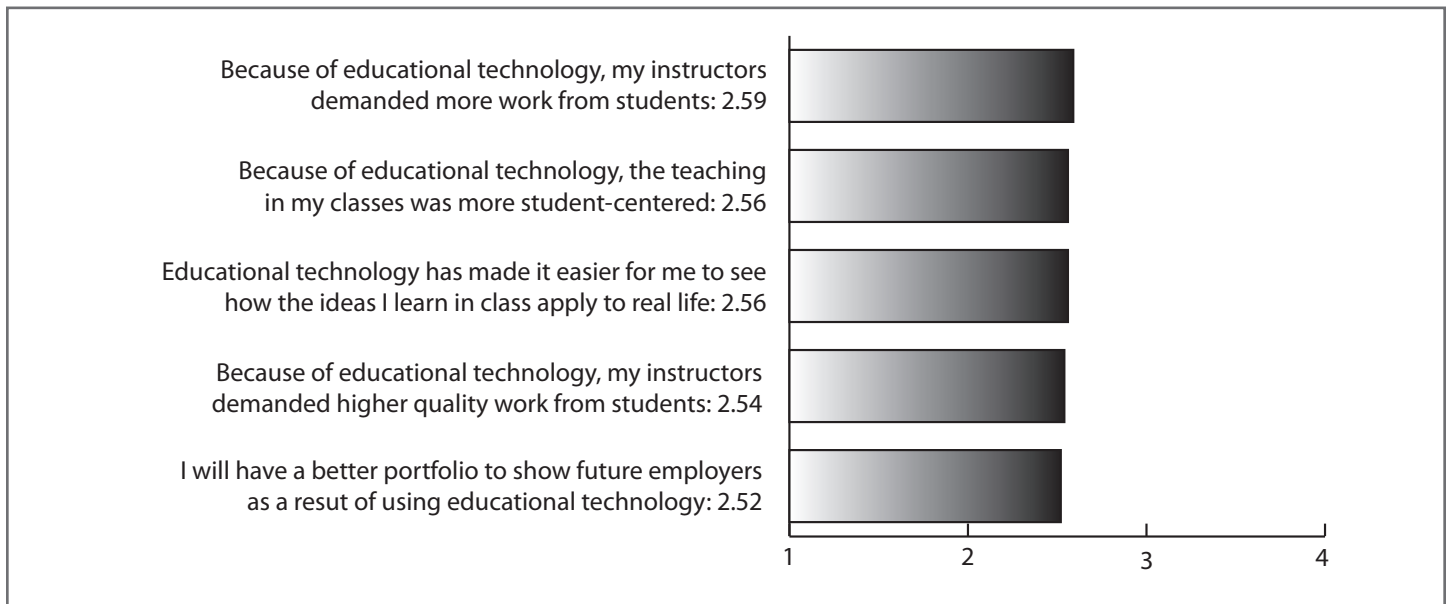


Figure 24: Lowest ranked statements about technology, by mean

life (preparing assignments; completing assignments on time; being more efficient) have an aggregate mean of 2.91. By contrast, the items which ask about pedagogical techniques other than information delivery (creating engagement; giving students control; making class student-centered; aiding work with other students; showing how ideas apply to real life; enabling feedback from instructors) have a noticeably lower aggregate mean, namely 2.73.

One should consider, however, that all items in this question were rated above the expected mean for a four-point scale, namely 2.5.

### QUESTION 12

Which of the following best describes your preference with regard to the use of educational technology in your courses?

- I prefer taking courses that use no educational technology.
- I prefer taking courses that use a small amount of technology.
- I prefer taking courses that use a moderate amount of technology.
- I prefer taking courses that use a large amount of technology.
- I prefer taking courses that use technology exclusively.
- No preference

### Data

See figure 25

### Analysis

Consistency is again the theme when comparing the responses to this question with those from 2007. Many students in 2009 opted for the moderate and large options in Question 12 – a total of 79.6% (in 2007, this figure was 77.5%) – indicating that the vast majority of students wanted a substantial amount of technology to be used in their classes. Further, the “no preference” number was very low at 2.8%, showing that almost all students had an opinion on this matter.



As in 2007, only a tiny minority of respondents (2.6%) preferred fully online courses. This response is consistent with the desire students have expressed elsewhere, as in Question 9 on this survey, to retain some degree of face-to-face contact in their educational experience.

One lesson which could be drawn from these numbers is that online courses will probably be used as a last resort by most students, when a face-to-face class is not an option

### QUESTION 13

How useful have each of the following educational technologies been to you in your coursework?

Scale: Very useful = 4, Moderately useful = 3, Slightly useful = 2, Not at all useful = 1

Mean of means: 2.93

Range of means: 1.77

#### Data

See figures 26, 27, and 28

#### Analysis

As in 2007, students' perception that technology is useful in their education emerges strongly in their responses to this question, where the mean of means is quite high. However, the range of means is also quite high, indicating that students regard some educational technologies as quite useful but others much less so.

The idea that educational technology is useful for information delivery can be seen in the top two responses to this question ("Email" and "Instructor's lecture notes or PowerPoint slides online"), which are rated far above the third-ranked response, and the "class captures" item.

The value students place on e-mail is likely due to its utility in giving students quick access to their professors rather than for its function in allowing them to communicate with fellow students. This interpretation is supported by students' responses to an open-ended question delivered in 2007, where e-mail to professors for feedback, clarification, etc. is one of the most common responses.

The high "never used" responses given to blogs and wikis are consistent with students' responses to Question 6, where many respondents also reported non-use of Web 2.0 technologies.

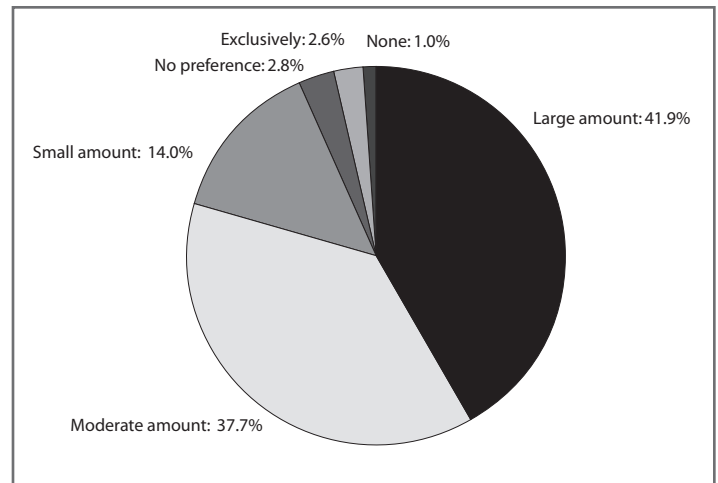


Figure 25: Preferences regarding the use of technology in conjunction with a class

### QUESTION 14

Please rate your level of comfort in each area

Scale: Very comfortable = 4, Comfortable = 3, Uncomfortable = 2, Very uncomfortable = 1

Mean of means: 3.00

Range of means: 1.17

#### Data

See figures 29 and 30

#### Analysis

The mean of means was quite high for this question, as it was in 2004 and 2007, indicating high comfort levels overall. More complex technologies, especially those involving media manipulation, were near the bottom in students' comfort rankings. These results reflect students' experience with technology but relative lack of sophistication. Once again, however, the mean for most of these items is still above 2.5.

The high comfort ranking given to "Google docs" is interesting in light of the fact that many technologists find that such cloud-based technologies have something of a learning curve. One hypothesis is that students may have simply seen the word "Google" in this item and answered 'very comfortable' on that basis alone.



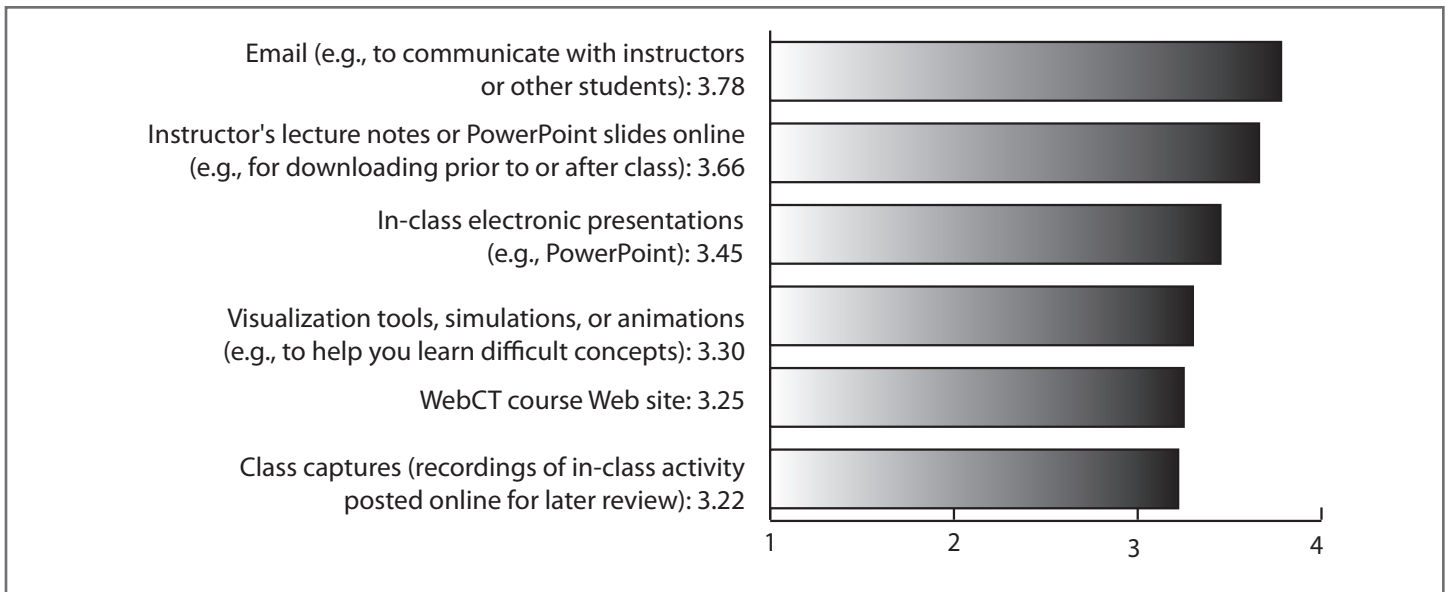


Figure 26: Highest ranked technology used in coursework

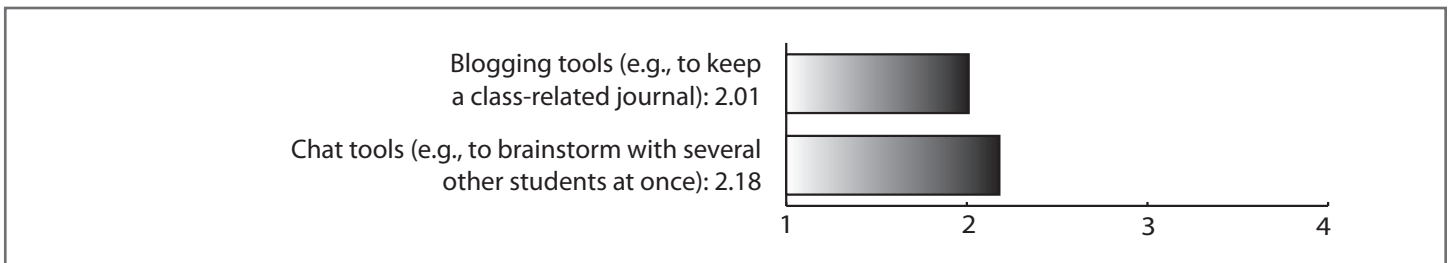


Figure 27: Lowest ranked technology used in coursework

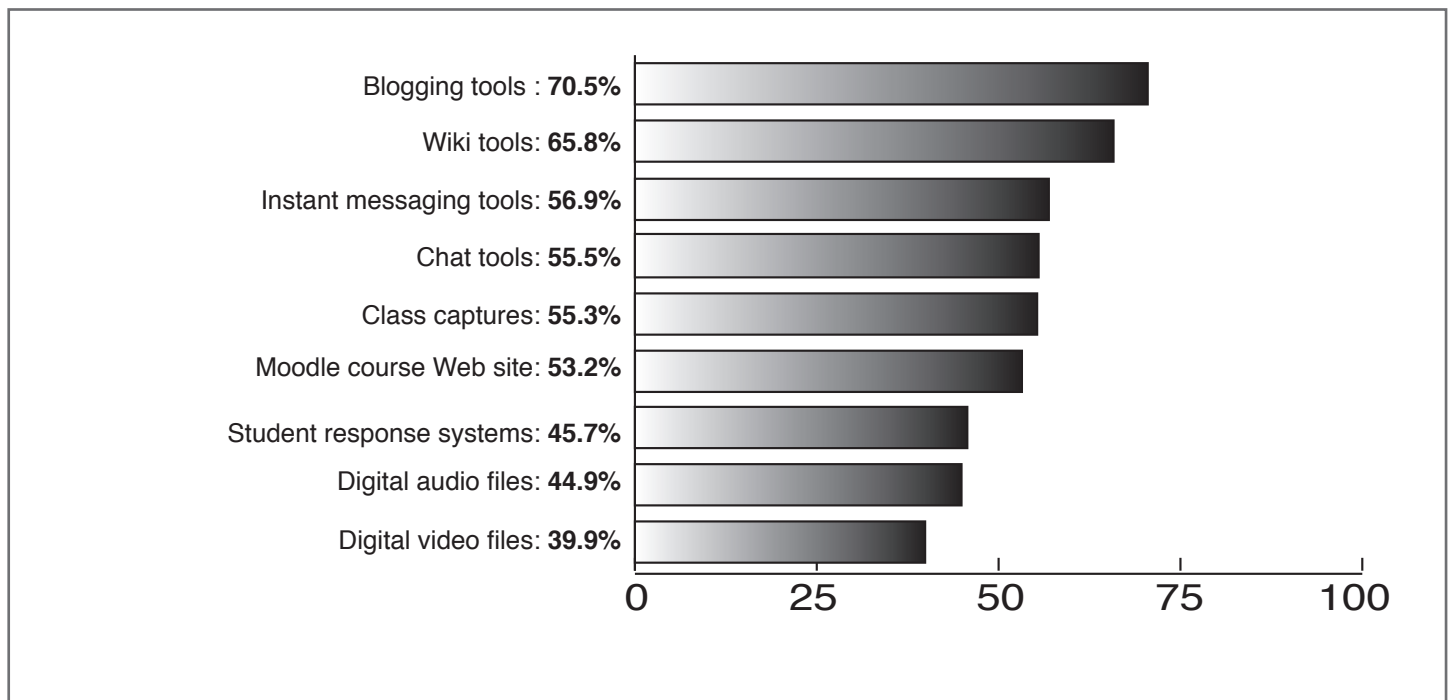


Figure 28: Technologies ranked as never used in coursework by highest percent of students

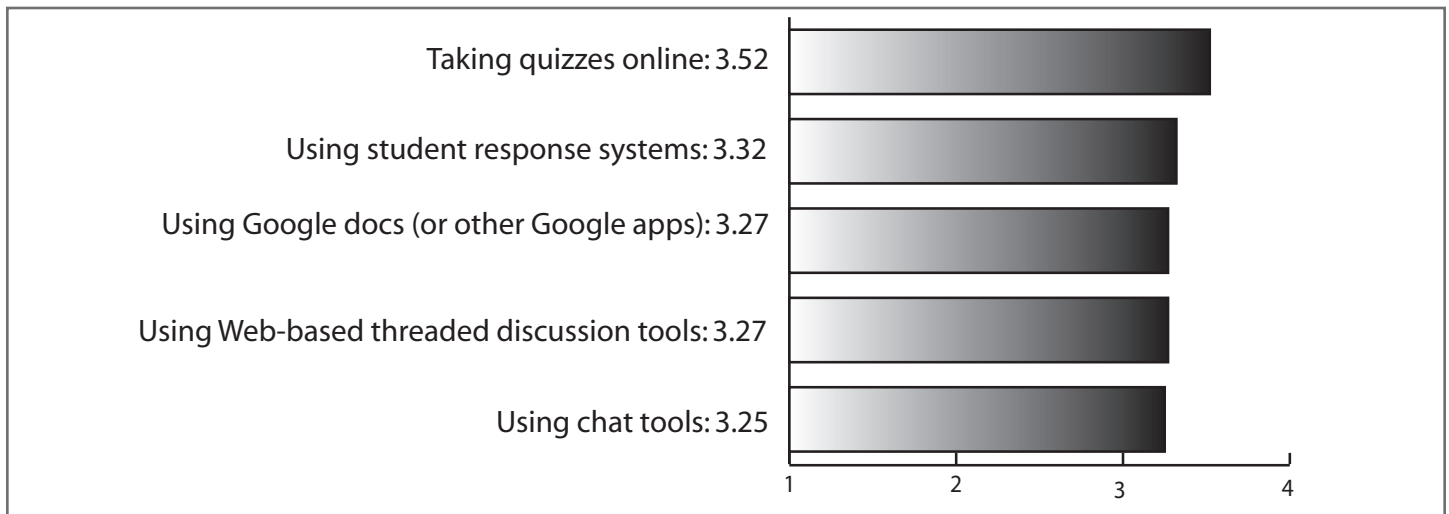


Figure 29: Mean scores of the technology uses with which students are most comfortable

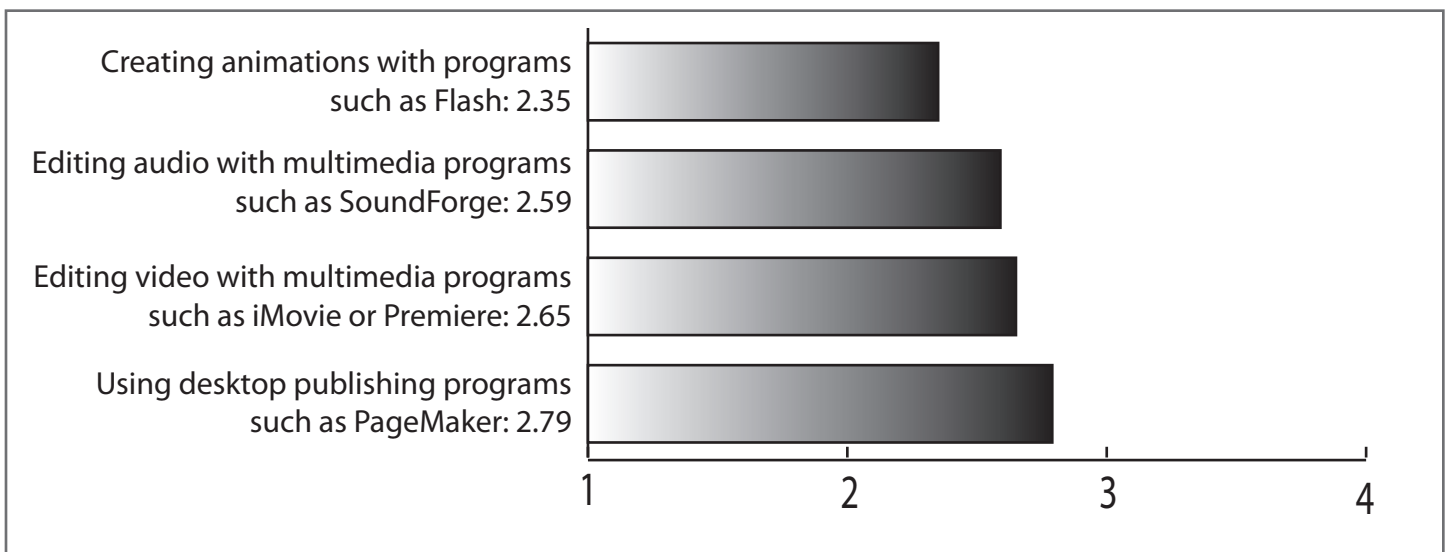


Figure 30: Mean scores of the technology uses with which students are least comfortable

### QUESTION 15

To what degree has each of the following factors been a problem for your use of educational technology in your courses?

Scale: Large = 4, Moderate = 3, Small = 2, Not a problem at all = 1

Mean of means: 2.11

Range: 0.86

#### Data

See figure 31 and 32

#### Analysis

As in 2001, 2004, and 2007, the overall rate at which students experience problems in their use of educational technology is very low, as indicated by the relatively low mean of means.<sup>22</sup>

However, responses to this question do seem to point to a slight increase in the rate of problems for students. The top two items are rated substantially above where they were in 2007 (2.27 and 2.26); the mean of means is somewhat higher than it was in 2007 (1.97); and the range has nearly doubled, from 0.48 to 0.86, possibly indicating that certain factors have become substantially more problematic for students in the last two years.

In 2001 and 2004, students ranked instructors not using technology as one of the top answers to a similar question. The 2007 and 2009 surveys distinguished between instructors not using educational technology at all and their not using it well, and it is interesting to see how that change appears to have affected student responses, with the latter option ranked in both 2007 and 2009 as one of the top two largest barriers.

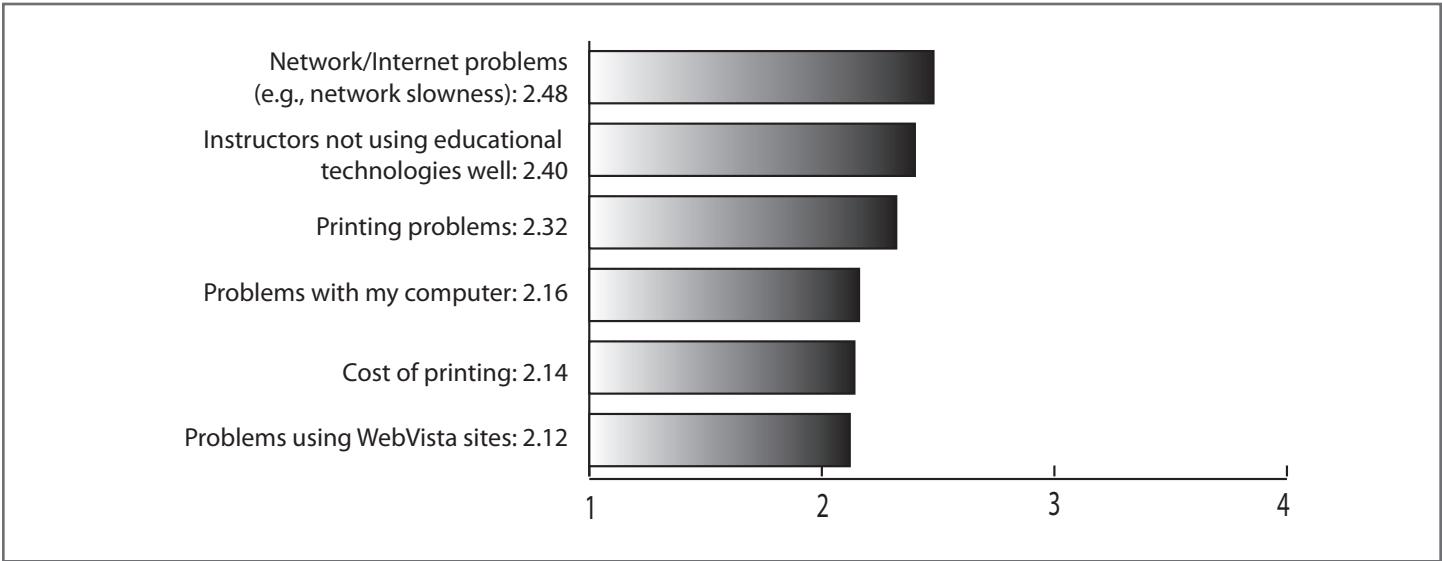


Figure 31: Mean scores of the highest-ranked problems related to the use of educational technologies in courses

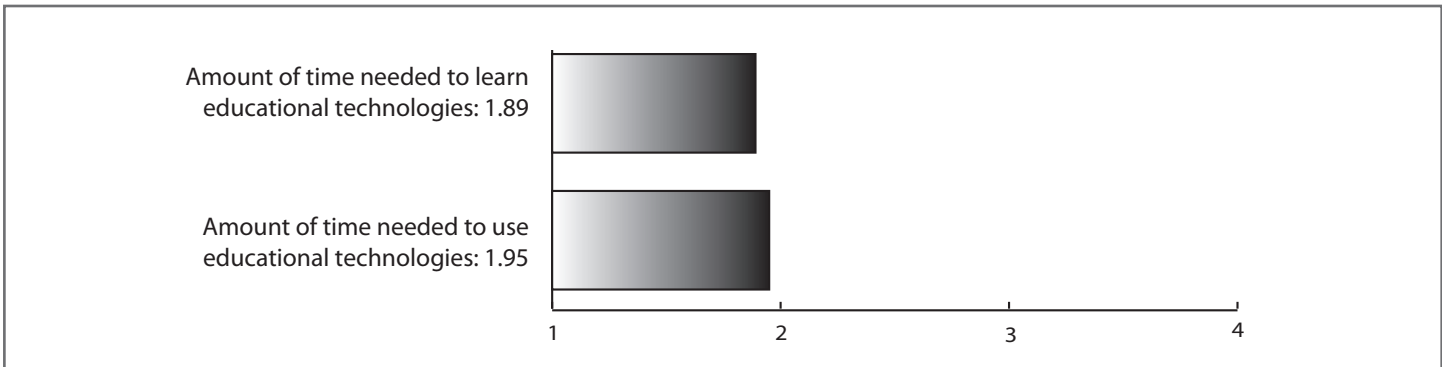


Figure 32: Mean scores of the lowest-ranked problems related to the use of educational technologies in courses

The contrast between students and faculty members on the issue of time is very striking. After reviewing results from the 2009 faculty technology survey, it would be difficult to overstate the degree to which time to learn and time to use technology are barriers for faculty members. By contrast, the two time-related items were ranked as the lowest barriers by students.

**QUESTION 16**

Before reading this question, were you aware that you probably pay a technology fee?

Yes    No    I don't pay a fee

**Data**

See figure 33.

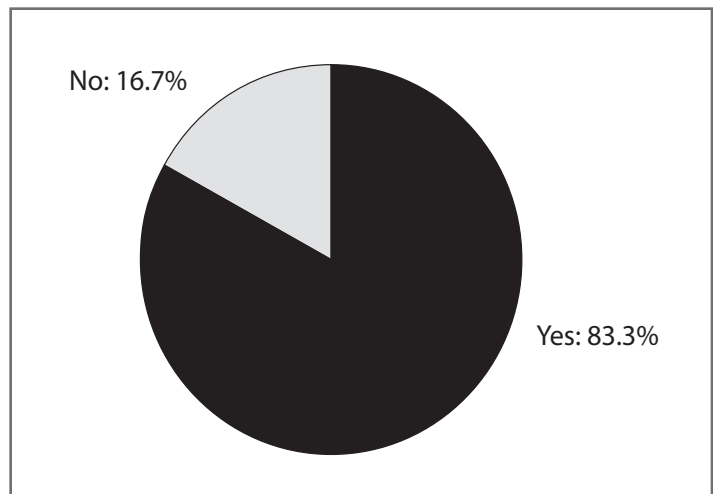


Figure 33: Students' awareness of technology fees, by percent

**QUESTION 17**

Do you know the approximate amount of the technology fee you paid this semester?

Yes No I didn't pay a fee this semester

**Data**

See figure 34.

**QUESTION 18**

Do you know who manages the technology fees you pay?

**Data**

See figure 35.

**QUESTION 19**

If you wanted to become involved in managing your college's technology fees, would you know how to do so?

**Data**

See figure 36.

**QUESTION 20**

How much do you know about what your college's technology fees are spent on? I know...

**Data**

See figure 37.

**Analysis**

A series of questions on technology fees reveals that almost all students who pay a technology fee are aware that they pay something, but most students know little beyond this basic fact. A substantial majority of students (nearly 60%) doesn't know the amount of the technology fee they pay. Very few students (<20%) know who manages their technology fees or how to get involved in the process if they wanted to, and nearly 90% of students say they know only a little or almost nothing about what their fees are spent on.

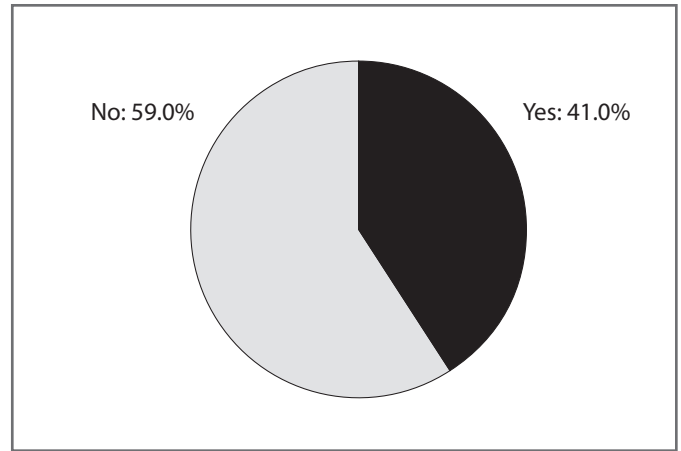


Figure 34: Percentage of students who know the amount they pay in technology fees

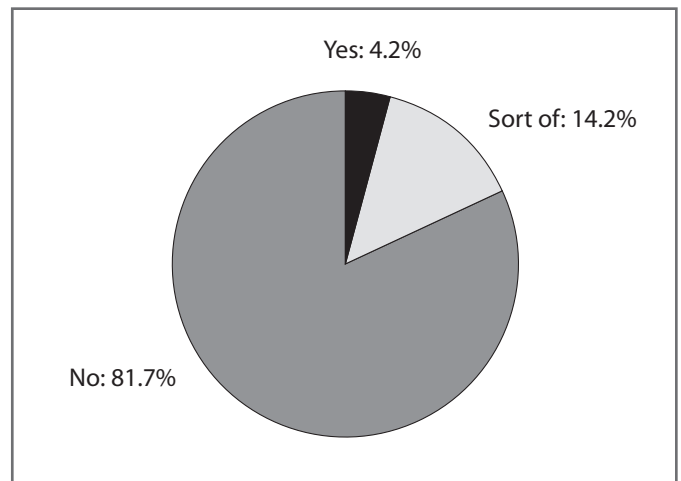


Figure 35: Percentage of students who know who manages the technology fees

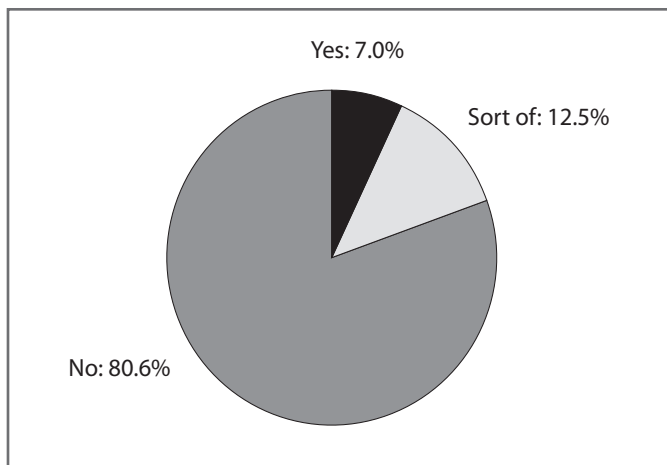


Figure 36: Percentage of students who know how to get involved in managing technology fees

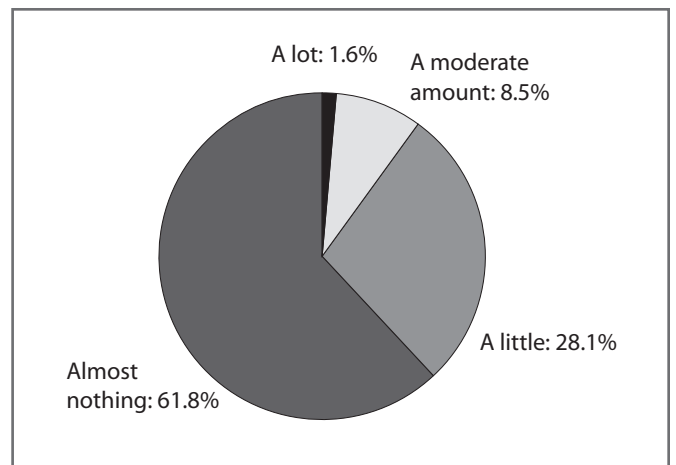


Figure 37: Percentage of students who know what technology fees are spent on

## Open-ended questions

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### Methodology

The survey contained three specific open-ended questions and one general catchall question asking for further comments. Respondents produced a large amount of data in response to these questions; once compiled, the answers to each question amounted to 50-65 single-spaced pages.

Accordingly, a sampling methodology was used in which a random sample of 20% of the responses was extracted, coded, and analyzed. The major themes, highlights, and narratives that emerged from the data are outlined below.

### QUESTION 21

**Many students use social networking sites (such as Facebook, MySpace, Bebo, Orkut) to keep in touch with friends and acquaintances. If you use such a site, how would you feel about efforts to integrate that site into your academic experience – seeing announcements from your classes in Facebook, for instance?**

This question was included in the survey because of the recent and very rapid rise in the popularity of social networking sites (SNSs) among college students. That popularity has led many instructors and administrators to wonder how these sites could be leveraged so as to improve students' academic lives.<sup>23</sup>

The general student attitude toward this proposal is very clear, however:

---

*“No. That would not be ok. Those sites are for pleasure outside of school. I would not want that incorporated.”*

---

*“Facebook is for fun, family, and friends – not for school.”*

---

*“I think it would be weird since these sites... are strictly social sites. Not only would I not want to deal with school things on a site that I use to keep up with friends in my personal life, but I would not want instructors to be able to look at my profile. I would be very uncomfortable with this.”*

Negative responses to the thought of integrating students' educational experience with SNSs were far more common than positive ones, with students' answers to this question running approximately 8:1 against the idea.<sup>24</sup> The vast majority of negative replies gave as an explanation discomfort with mixing the social and personal side of students' lives with the more academic and professional side.

A minority of students were more positive about this proposal, however, usually citing the convenience of receiving academic announcements in a place they already visit several times a day. Many of the more thoughtful replies to this question came from students who appeared willing to consider the integration of the academic and the personal, but only if certain conditions could be met:

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*“Announcements could be useful, but I wouldn't necessarily want my professors and classmates to have access to my personal information on those sites. So, if there were some way to separate that, it might work.”*

### QUESTION 22

**Many students use digital technology during their classes for purposes that may or may not be related to the class itself (e.g., sending text messages, reading Web pages, checking social networking sites like Facebook). Do you use technology in this way, or have you seen other students do so? If so, what are your thoughts about this practice?**

Student responses to this question could be divided into three broad groups. To begin with, almost all students agree that if students' in-class technology use disturbs or distracts other students, it isn't OK:

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*“I think this is highly problematic when it distracts all students from learning.”*

---

*“It gets out of hand when it's distracting other students.”*

### **In-class tech use distracts others, hence not OK.**

However, students disagree sharply about whether such uses of technology are, in fact, distracting for others. The first main group of students believes they are:

---

*“I know I have personally been distracted when someone was using their computer in front of me to play games.”*

---

*“It’s really annoying... to be sitting behind a chronic Facebooker in a class.”*

Many students disagree with this assessment, however:

---

*“It doesn’t affect my learning when the person next to me is on Facebook, or is texting.”*

---

*“I don’t find it distracting personally, and sometimes it keeps me awake so I can still partially listen.”*

Within the group of students who do not believe that digital technology use in class is generally or substantially distracting for others, there are two sub-groups, distinguished by whether they draw the conclusion that such uses of technology are permissible.

### **In-class tech use does not distract others, but is still not OK**

The second group consists of students who believe that in-class technology is not OK even if not distracting to others, on the grounds that it is “rude”, “disrespectful”, or “insulting” to the instructor:

---

*“I don’t do this, but it is the most disrespectful thing. They may as well not be in class.”*

---

*“I think it is rude to be doing things that are not associated with the class during that time.”*

### **In-class tech use does not distract others, and is therefore OK**

Finally, the third group contains students who believe that in-class use of technology is OK precisely because it is not distracting. These students often appended one of several supporting reasons to their views:

- it hurts only the students doing it: “It’s their own fault if they miss something if they were on Facebook.”
- instructors should make class more interesting: “It’s up to the teacher to keep the class interesting and challenging otherwise people start to get bored.”
- students are busy and need to multitask: “I see nothing wrong with this. I am a student who has multiple things going on in my life... there is no reason why I cannot be planning out other things whether or not its school related.”

### **QUESTION 23**

**In the past, some students have expressed the concern that their professors do not make good use of educational technology. How could your professors improve their use of educational technology in the classes you have taken?**

Student responses to this question revealed the tendency among University students, manifested elsewhere in the survey results as well, to see educational technology’s primary function as content delivery. The responses leaned strongly in favor of using technology to provide PowerPoint slides or professors’ lecture notes online for class make-up or exam review:

---

*“I think that if a professor uses PowerPoint or other slideshows, that they should put it on WebVista after... when they are going quickly in class, it is amazing to go to WebVista and find the lecture on PowerPoint to get points that i missed or to review for tests.”*

Further themes in the responses included:

- using technology for administrative functions (posting grades and syllabi online)
- never using technology for its own sake
- using technology well (i.e., uncluttered slides, well-organized Web sites, not reading from PowerPoint slides)

---

*“Think of creative ways to include... audio, visual materials and use Moodle to improve and facilitate communication among students.”*

---

*“PowerPoints are NOT effective when there is nothing but words covering a slide.”*

---

*“We are all in college, and we all know how to read. Professors should never read their slides to us.”*

---

*“By only using it [educational technology] if it’s USEFUL. Don’t just use technology to be using it.”*

---

*“Education technology is good - in moderation. Many professors lean WAY too heavily on PowerPoint presentations and when someone stops them to ask a question, they get frantic because now they are behind on their slides. I think PowerPoints make class structure sometimes too rigid and don’t allow for as much creativity or flexibility that is necessary in classrooms to facilitate learning.”*

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## Relationships

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In this section, we describe the demographic factors that were associated with the way in which students experienced educational technology.<sup>25</sup>

### Age

In 2004, older students tended to be less happy with educational technology than were younger students. Older students had less experience with educational technology, were generally less comfortable with it, and found it harder to learn. In 2007 the relationship between age and educational technology attitudes, comfort levels, etc. had

weakened, possibly simply because the younger students in 2004 were three years older.

Data from the 2009 student technology survey continue the trend begun in 2007. There was some evidence in the survey data that age made a difference in a student’s relationship with technology:

- Younger students accessed online course materials more frequently than older ones did.
- Younger students rated their technical skill levels significantly higher than older students did.

But there was far more evidence that age does not make a crucial difference in determining how a student relates to technology:

- Younger students were not, in general, more likely to own portable technologies than were older students. Instead, the picture was mixed:
- Older students were significantly more likely to own PDAs and netbooks.
- Younger students were significantly more likely to own audio players, video players, and laptops.
- Younger students were not, in general, more likely to own media-related technologies than older students were. Instead, the picture was again mixed.
- Younger students expressed stronger preferences for face-to-face courses than older students did.
- The attitudes of younger students toward technology did not differ significantly from the attitudes of older students.
- Younger students did not say they want to see more technology used in their classes than older students did.
- Younger students did not find technology more useful than older students did.
- Younger students did not express higher comfort levels using technology than older students did.
- Younger students tended to report more problems with technology than older students did, except in one area: time. On the two time-related items in the problems question (time needed to learn about technology and time needed to use technology), older students reported more severe problems.

### Gender

Unlike the 2004 survey, in which there were few differences apparent between the genders, the 2009 survey continues a pattern of gender differences regarding technology which was established in 2007. The pattern is difficult to summarize succinctly, but it does not fit the stereotype according to which women are technophobes and men are technophiles.



For instance, as compared to men, women reported similar attitudes toward technology and equal or greater experience with technology in their classes. However, men reported higher comfort and skill levels, which may indicate a gendered response pattern to certain types of questions. It seems that if men are asked about themselves (How skilled are you? How comfortable are you?), they tend to give very positive responses, whereas if men are asked about technology itself (What technologies have you experienced? How useful is this or that technology?), they give answers very similar to those given by women.

### **Attitudes**

Men and women showed very similar attitudes toward technology.

### **Self-rated skill using technology**

As in past years, there is a big gender effect here, with men rating their own skill levels much higher than women rate theirs.

### **Usefulness in classes**

Continuing and strengthening the trend from 2007, women rank 12 out of 16 technologies more useful in their coursework than men, with 7 ranked significantly higher.

### **Comfort levels**

In another clear continuation of a pattern established in earlier years, men report higher comfort levels on 11 out of 12 technologies listed, with significantly higher comfort than women on 10.

### **Problems**

In 2004, there was some indication that women experience more technical difficulties than do men. In 2007 and 2009 that indication has grown much stronger, with more significant and near-significant differences. In 2009, women reported more severe problems than men on 10 out of 14 items, with significant differences on 5.

### **Amount of technology used in courses**

Again, in 2009 there is no gender split on preferences regarding technology use in courses, which is interesting given that men find technology less useful and women are less comfortable with it. A possible explanation is that these attitudes balance each other out.

### **Experience with technology**

Since 2004, women report at least equal and in some cases greater experience taking courses that use technology in different modes than do men. In 2009:

- 36.9% of men had taken at least one totally online course, while 50.1% of women had done so, and
- 35.9% of men had taken at least one hybrid course, while 46.2% of women had done so.

### **Media tech ownership**

Men are more likely to say they own all of the six media-related technologies in this question, with significant differences on 4 items (camera, audio player, video capable computer, video editing software).



## NOTES

<sup>1</sup> Howe and Strauss, 2000; Palfrey and Gasser, 2008; Tapscott, 1998, 2008.

<sup>2</sup> Oblinger and Oblinger, 2005. See also the critical view in Bennett, 2008.

<sup>3</sup> In 2009 it was not possible to determine how many email addresses in the original recipient pool were bad or inactive, so the total number of survey recipients was probably somewhat lower than 5721.

<sup>4</sup> We wish to thank J. Scott Murdoch and John Kellogg of OIR for their invaluable help with this project.

<sup>5</sup> University of Minnesota IRB study number 0701E99328.

<sup>6</sup> University of Minnesota College of Human Ecology Technology Learning Center, "Instructional Technology Evaluation Project," 11/5/01.

<sup>7</sup> University of Minnesota Digital Media Center, "Multi-College Student Survey Report," 11 February 2003, <http://dmc.umn.edu/surveys/student-eval/student-eval.shtml>.

<sup>8</sup> Dillman, 2008.

<sup>9</sup> Washington, D.C: National Academy Press, 1999.

<sup>10</sup> AAHE Bulletin, October 1996: 3-6. Accessed online at <http://www.tltgroup.org/programs/seven.html>, 11/9/09.

<sup>11</sup> See note 3 above.

<sup>12</sup> This theme emerges in Salaway 2008 and in Windham 2005.

<sup>13</sup> The figure for WebVista use is somewhat higher than that reported in Salaway 2006 from a study of 98 colleges and universities.

<sup>14</sup> A similar conclusion is reached in Caruso 2006. It is worth noting, however, that student attitudes toward the first group of uses were still positive, though not as positive as attitudes toward the second group of uses. See the data for Question 13, below.

<sup>15</sup> For details, see the data for Question 6, below.

<sup>16</sup> This point is confirmed in Salaway 2008.

<sup>17</sup> For details, see the data for Question 23, below.

<sup>18</sup> Salaway 2008 also notes the popularity of mobile devices among undergraduates.

<sup>19</sup> This estimate may be biased due to overrepresentation of graduate students in the survey sample. If so, then the actual parameter is slightly higher than the statistic reported here.

<sup>20</sup> For the purposes of this survey report, the professional schools are Medicine, Nursing, Veterinary Medicine, the Carlson School of Management, Law, Public Health, Pharmacy, and Dentistry.

<sup>21</sup> This estimate may be biased due to overrepresentation of graduate students in the survey sample. If so, then the actual parameters are slightly higher than the statistics reported here.

<sup>22</sup> This estimate may be biased due to overrepresentation of graduate students in the survey sample. If so, then the actual parameters are slightly higher than the statistics reported here.

<sup>23</sup> See, for example, EDUCAUSE 2006.

<sup>24</sup> Salaway 2008 reports a more even split in student opinion on this issue than the one reflected in student responses to Q21.

<sup>25</sup> Several statistical techniques were used to examine these relationships, including correlation, regression, t-tests, chi-square, and ANOVA. In all cases, the level of statistical significance was set at  $\alpha = .01$ .

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