
College student Internet use

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Abstract

Many surveys of World Wide Web and Internet use have been conducted, but few have focused on students at colleges and universities. Here, a case study of 214 undergraduate and graduate students at two universities in the USA, provides a glimpse of how students use a campus information system for e-mail, downloading movies and music, and other purposes.

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Introduction

In year 2000, nearly 104 million people used the Internet in the USA, and one of the most Internet-connected demographic groups is college students. About 93 per cent of college students in the USA access the Internet in a given month, and the number of student users is expected to grow from 15.2 million in 2003 to 16.4 million in 2007 (Greenspan, 2003). Further, 88 per cent of college students own a computer, 56 per cent have broadband connections, and 36 per cent use mobile devices (cell phones, PDAs, etc.) to access the Internet (Harris Interactive, 2003). About 20 per cent of college students began using computers between the ages of five and eight, 47 per cent first began using the Internet at home before they arrived at college, and 85 per cent own their own computer (Pew, 2003).

However, much is still unknown about how college students use the Internet, Web, and campus information systems for academic work and leisure. A case study was conducted using 214 students from two relatively small public universities in the southern USA: the University of Mississippi (hereafter designated UM) and Georgia College and State University (hereafter designated GC). UM (11,000 students) was listed as number 36 in Yahoo's list of "most-wired" universities in 1998, and number 57 in 1999, but GC (5,500 students) was not listed in the top 200. A sample of 87 undergraduate and 38 graduate business students were surveyed at UM, and 89 mostly non-traditional students with extensive work experience were surveyed at GC (four were graduate students).

The survey sample was drawn from intact classes; however, the classes were chosen at random. While all the classes were School of Business classes some were general classes taken by all business majors, while others were related to the information systems major. Even in classes that were intended for information systems, majors there were several non-IS majors taking the classes as electives.

In the case of the GC students the classes were picked at random from two campuses in different proximate cities. The four GC graduate students were counted as a part of the undergraduate sample because all four were enrolled for a cross-listed class primarily meant for undergraduates. The graduate students in



question needed the class credit because they lacked this class at the undergraduate level. Also, the GC sample is very diverse in terms of age and past computer experience.

Given the diversity of the sample used, the only generalization that can be made is that all students participating in the survey had two or more years of computer use experience and were relatively savvy Internet users. Hence, while formulae were not used to derive sample size it is a relatively random sample. While this was a sample of convenience and limitations might not be generalizable to all college students, similar samples of convenience have been used in the past in related published research.

The survey results for the sample used have been summarized in Table I and are discussed in detail below along with supporting research from other universities.

E-mail use

While college students spend a large amount of time browsing the Web, much time is also spent sending and reading electronic mail. The total number of e-mail messages sent daily will exceed 60 billion worldwide by 2006, compared to 31 billion e-mail messages sent daily during 2002. About 42 per cent of college students go online to communicate socially and 72 per cent check e-mail at least once a day, with 66 per cent using at least two e-mail addresses.

In a survey of 279 students at the University of Texas in 2002, 21 per cent sent or received more than 50 messages per day, 38 per cent between 25 and 50, 33 per cent between ten and 25, and

8 per cent less than ten (University of Texas, 2002). At the University of Washington, 57,800 faculty, staff, and students using 60,000 e-mail accounts send and receive 500,000 messages per day (University of Washington 2003), and on 27 February 2003, 141,202 e-mail messages were processed at Marshall University with 4.6 per cent and 19.4 per cent sent to and received from the University's addresses (Marshall University, 2003).

Our survey showed that the percentage of time spent online with e-mail varied considerably (UM-undergraduates = 22.82 per cent, UM-graduates = 5.99 per cent, GC = 30.99 per cent). The variation could be explained by differences in the amount of Web assignments, the use of distance learning, and other academic factors. However, it is clear that electronic mail is an important part of students' academic and social lives.

E-mail spam

Estimates of spam (mass, unwanted e-mail) range from 20 per cent to 53 per cent of all messages (International Network for Social Network Analysis, 2003; Rhyolite.com, 2003; Saunders, 2003; Wagner, 2002). It takes an average 4.5 seconds to delete each spam message, resulting in \$8.9 billion lost in productivity in 2002. Almost 80 per cent of American e-mail users find spam very annoying, and 74 per cent would like to see spamming outlawed. Unsolicited pornographic e-mail is considered to be the most annoying spam, followed by messages selling mortgages and loans, investments, and real estate.

Because of the real or perceived problem of spam, many companies and universities are installing e-mail filters. For example, in the fall semester of 2000, the Computer Science Department of Indiana University's Bloomington Campus was becoming overwhelmed by the amount of unsolicited commercial e-mail directed to their servers (of an average 14,000 e-mail messages daily, approximately 3,500 were spam). The 1,200 e-mail users in the department were spending about 150 man-days per year managing spam (ActiveState, 2003). After installing an e-mail filter, almost all of the spam was accurately

Table I Survey results

	All	UM-UG	GC	UM-grad
Hours/month Internet use	24.7	14.9	28.4	38.4
Hours/month campus e-mail use	7.3	3.4	1.7	11.9
Worm-spam messages/month	197.6	149.3	268.0	119.0
Hours/month movie-song download	3.7	1.4	8.9	0.7
Movies-songs download/month	9.5	6.1	10.9	4.0
Hours/month Blackboard use	6.6	6.4	5.4	2.9
Hours/month Internet use on-campus	14.3	9.0	15.0	20.7
Hours/month Internet use off-campus	7.4	5.0	8.1	14.3
Speed satisfaction (1: bad – 7: good)	4.2	3.7	4.8	4.4
Overall satisfaction (1: bad – 7: good)	4.8	4.7	4.9	4.7

excluded and 30 to 50 e-mail messages per day were quarantined for virus infection.

Results from a study of one e-mail account during the month of April 2001, for example, showed that 312 junk e-mail messages (over ten per day) were received (minimum = three, maximum = 17) (Cambridge2000.com, 2001). Our survey shows that students reported from 119 to 268 spam messages per month (an average of four to nine messages daily), and UM's faculty senate is currently discussing policies and methods to reduce spam e-mail.

Music and movie download

About 78 per cent of college students go online for fun (versus 64 per cent in overall population), and 57 per cent go online for some activity other than e-mail. About 47 per cent of employees in the USA spend at least half an hour a day cruising the Web for personal reasons, and college students also browse in computer labs or electronic classrooms. College students visit music, movie, fashion, video game, and consumer electronics sites, and higher proportions of college students are online from midnight to 4a.m. than any other category of users.

As of September 2002, 28 per cent of Americans over 12 years of age (about 60 million) had downloaded a music file from the Internet, and KaZaa (one file-swapping program) claims 140 million users, twice that of Napster at its peak (Menta, 2002). A large percentage of traffic to file-swapping download sites comes from college PCs, and college students are twice as likely to have downloaded music files compared to all users (60 per cent) and on any given day (14 per cent versus 4 per cent) (Jones, 2002). About 44 per cent of college students share files from their computers, including movies and music.

Our survey shows that UM undergraduates spend more time on the Web downloading multimedia (9 per cent of all time on the Internet) and download more movie and music files than graduate students (2 per cent of all time on the Internet). The older, non-traditional students at GC reported spending nearly 31 per cent of their Internet time downloading movies and music.

However, downloading multimedia files is often illegal and there have been a few instances of punishments. For example, the US Naval Academy has disciplined 85 students accused of illegally downloading music, and the Recording Industry Association of America sued four students at three universities for running tools on their personal computers that allowed other people to search the campus networks for MP3s and other files (*Business Week Online*, 2003).

The music industry first noted the impact of Internet piracy in 2000, when worldwide sales of recorded music dropped 1.3 per cent, although other factors in the broader economy are likely to have contributed to the fall. However, the largest decline, 5 per cent, was in Canada, which has one of the highest levels of high-speed Internet use in the world, giving a significant proportion of its population the capacity to quickly download music files.

Blackboard and WebCT use

Blackboard (2003), WebCT (2003), and related technologies provide network-based tools for exchanging messages between students and teachers, posting assignments, proctoring and grading examinations, and other services to support education. Blackboard claims to be used by more than 2,000 schools (including UM) and other organizations for teaching, WebCT (used by GC) claims to be the leading provider of integrated e-learning systems for higher education and is used by thousands of institutions in over 80 countries. More and more universities are moving toward distance and on-line education, and the number of courses offered with the technologies continues to grow (University of Columbia, 2001; Murdock University, 2001; Oregon State University, 2003).

As these education technologies tend to be used more by undergraduates nationally, our survey shows that UM-undergraduates reported using Blackboard nearly 43 per cent of their time on the Internet, while UM-graduate students use it only 14 per cent of the time. GC students reported spending about 10 per cent of the time on the Internet using WebCT.

System use and satisfaction

Over 270,000 unique visitors view over 700,000 Web pages on the University of Mississippi's campus system (91.7 per cent of visitors using Internet Explorer and only 5.5 per cent using Netscape) each month. In our survey, subjects reported that they use the campus information systems from 28 per cent to 37 per cent of the time from off campus, perhaps preferring the privacy not provided in computer labs where screens are visible by others. In addition, 69 per cent of college students in the USA live off campus, and accessing the campus information system from home might be more convenient.

The most common complaint of Internet users is lack of speed downloading pages. After waiting past a certain "attention threshold", users bail out to look for a faster site. Of course, exactly where that threshold is depends on many factors. Some have suggested that the threshold is 8.6 seconds with partial, useful content within two seconds (King, 2003). Our survey showed neutral satisfaction with delays on the Web speed, and slightly better overall satisfaction with the campus Internet service provider (ISP).

Conclusion

American college and university students are among the most computer-savvy and "connected" users of the World Wide Web and the Internet due to their level of education, availability of computers (in computer labs, electronic classrooms, and their own rooms or apartments), and typically free access to the Internet with the school acting as the ISP. This paper shows how a sample of college students in the USA use e-mail, download music and movies, and use educational software such as Blackboard and WebCT. Managers of campus information systems need to be aware of the needs of their target audiences (students, faculty, and staff), such as a reliance on electronic mail and growing use of educational software, as well as potential problems such as rising incidences of spam and illegal downloading of music and videos.

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