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SERU21 Project Background Paper

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Undergraduate Student Computer Use: A Literature Review of Current Research

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I. A Review of Recent Research on Undergraduate Use of Computers and Instructional Technologies

Computer and online use has drastically increased and today is now a major component in our society. This dimension of interpersonal interaction and communication has created a new aspect of the social that has historically been unexplored by theorists. University students have now begun to transform along these technological boundaries incorporating this social space as a part of their student experience. Today, younger cohorts who have grown up with this technology are emerging within the student body. How they transform and create this technological domain, along with the older cohorts, within the sphere of higher education should be further explored. As the University of California system continues to grow through the 21st Century the research surrounding this phenomenon will be pertinent to better understanding and facilitating the increasing technological need of the students and academia.

The use of computers and cyberspace is increasing at a tremendous rate and discussions within the United States government concerning this interaction suggest that this technology will continue to become an even more significant "backbone" of the social and economic structure of this country (Gurak, 1997). The overwhelming mass of technology infiltration appears to augment the social environment within the "real world" that we have grown accustomed to. According to Dateline's report on the Nielsen/NetRatings, in the month of June 1999, there were a total of 63.4 million total active Internet users in the United States and 105.4 million total U.S. users with Internet access. The average American user per month visited 12 web sites and spent 7 hours, 38 minutes online with an average duration of 53 seconds for each website page viewed (Dateline Internet Report, 8/01/99). However, Ask.com projects the current Internet Universe to be composed of 129,661,799 individuals.

The Internet has passed through many different molds and layers to become what it has today. At its most basic, "the Internet can be characterized as an interactive (two way) communication network linking users with one another and with distant computers (servers)" (Owen 1999, p. 199). Initially, the Internet began in the early 1960s funded by large Defense Department grants to increase military communication, which had fallen short during the Cuban missile crisis and the Bay of Pigs invasion. These grants were distributed to universities' computer scientists to "develop communication networks that would be less vulnerable to enemy attack" (Owen 1999, p. 199). This new form of communication, which was originally seen in the computer

network APRAnet, was created to be superior to the traditional telephone networks. This was made possible because a digital packet system can break down any message form into bits, alleviating the possible congestion on a given line. However, it is clear that "the Internet, pioneered by the US military to maintain communication in a nuclear war, was intended to have no center and limited hierarchy" (Loader 1997, p. 74). Once the initial interest of the U.S. military declined including funding, ARPAnet was created into NSFnet by the National Science Foundation where it began to thrive. "Through ad hoc committees, debates, and experiments, they developed standards and protocols ensuring connectivity among campus computer networks" (Owen 1999, p. 201). The history of the Internet has evolved mainly through the academic realm with little if any input from the United States government.

Once the educational community took over, the Internet began to proceed through its developmental stages. Basic applications, which later evolved into the Internet we know today, were first created through Telnet, Gopher, Archie, and WAIS. Once the World Wide Web invented by Tim Berners-Lee came into existence in 1993, "commercial research organizations were drawn in, both because the content of the Internet was heavily research oriented and because the e-mail capabilities of the Internet facilitated communication within the research community" (Owen 1999, p. 201). The popularity, partially due to the easier accessibility of the Internet, grew especially when it became privatized between 1992 and 1995. After this point in time "communication companies cooperated with one another in providing pieces of the network (transmission facilities, access points, routers), while industry committees and the Commercial Internet Exchange facilitated agreement on interconnection standards" (Owen 1999, p. 202).

The initial interest of the government originated around the time when the Internet began generating income and spread beyond the "Net Heads" to a broader audience. The Internet is quite different from the model that Congress hoped to create and market, since it maintained an aura of self-propelling governance. It has extended from the historical stereotype of the "computer nerd" to 2.2 million computers with a global network connection between 135 countries that continues to grow at a rapid rate of ten to fifteen percent per month (Aufderheide, 1999). The Internet's globalising qualities are responsible for producing new formulations of social interactions and governance towards the re-emergence of local cultural identities, participatory democratic activity, and economic regeneration (Loader, 1997). Due to the Internet nation-state boundaries are deteriorating from the development of global economies and also from the inability of national governments to control and dominate over communications in cyberspace (Loader, 1997). On the Internet, the U.S. Constitution acts only as a local ordinance in contrast to the "real world" in which the Constitution maintains its status as the legislative foundation for our country.

The more recent developments of computer technology and the Internet have created the existence of a new form of debated and controversial social space. This new dimension has lead current theorists to question the capabilities of this new phenomenon, in addition to reexamining the preexisting social categories. Despite the skepticism from certain social scientists, the emerging research indicates the capability of this technology to create and foster a sense of identity, culture, and social interaction. This is especially true with our capacity to examine the interactions of the younger

cohorts that have been brought up with this form of technology and actively engage in everyday social life with computers. In addition, past studies indicate that the younger generation has the capacity to establish a similar degree of social attachment to those on the Internet as they do in relationships that have physical contact and interaction. This social phenomenon has also become increasingly evident in the social interactions with this technology among other generations as well.

The research focusing on undergraduate student computer use, specifically centered on the University of California system, provides both insight into this phenomenon and the shortcomings that need to be further analyzed. The literature reviewed in this paper does not span the entire existing body of research on this broad subject but covers approximately fifty sources that capture a foundation of areas on student computer use. Particular attention was placed on existing available material that specifically focuses on a University of California campus. The following sections provide a brief discussion and conclusion of the primary topics of research, the shortcomings or gaps within this research, and possible future areas of inquiry on student computer use.

Primary Topics of Research on Student Computer Use

Studies conducted on undergraduate student computer use tend to focus on a pattern of specific topics. These primary areas include:

Gender Differences: Studies analyzing student computer use often highlight or focus on the differences between males and females in their time spent interacting with computers or their technological competence level. Though gender identity with technology is an important topic of inquiry, often this area overshadows other vital variables of influence.

Distance Learning: With the added dimension of technologically driven distance learning in higher education, individuals within the academic spectrum have invested a considerable amount of research on this new form of education. Though there has been a justifiable critique on past research analyzing this area, the effectiveness of distance learning has primarily been measured by student outcomes (i.e. grades, test scores), attitudes about this form of education, and overall satisfaction.

Internet Dependency and Addiction: Due to the recent technological developments of electronic interaction some studies have focused upon the extreme cases of Internet use.

Personal Attraction: Primarily through the area of social psychology, theorists have studied the personal attraction experienced by those online. These studies emphasize the ability of individuals online to form relationships both platonic and romantic without prior face-to-face contact. In addition, this research has also indicated the ability of electronic communication to foster social ties within the physical community.

Basic Communication Behaviors: Basic computer-based interactions such as email or web browsing have been of particular interest within this area of research. The connections that are created and maintained via electronic communication have highlighted the Internet's ability to contain the social in a space not defined by physical or time boundaries.

Shortcomings or Gaps in Research

Past research has exhibited certain shortcomings while studying undergraduate student computer and technological use. These include:

Size and Selection of Samples: Studies conducted on this topic maintain shortcomings within the sampling framework both in size and selection. A large percent of research from this body of literature primarily conduct surveys with a small number of participants. These samples typically range from approximately fifty to two hundred students. Those studies on undergraduates that do maintain larger sample sizes tend to have a broad perspective placing limited emphasis or questions on technology. What is even further problematic for this sample is the selection process. Rather than utilizing random sampling methods researchers typically use convenience sampling, choosing to administer the survey to a few large or topic focused courses and computer facilities.

Focus on Basic and Primary Computer Interactions: Basic frequency statistics on email use, general Internet browsing, and technology and computer access are primarily reported in research focused on this topic. Such information provides an adequate parameter or outline on student behavior however it is limited both in depth and applicability on the undergraduate student experience with technology especially when examining the University of California system.

Existing Facilities: Past studies and papers developed by various technological centered interest groups or task force teams within the University of California system tend to focus on gathering information on existing facilities on a campus per campus basis. These studies tend to be smaller in scope and centered on specific campus IT issues therefore limiting their comparability to other UCs.

Lack of Theoretical or Conceptual Framework: Theoretical or conceptually driven research is virtually absent from research on student computer use. Such methodological frameworks provide a foundation to further extend prior research. Concepts such as the life span perspective could potentially apply to the recent cohort phenomenon of the presence of technology at an early age creating long-term pathways that shape the online and offline interaction later in life.

Limited Analysis or Acknowledgement of Student Differences: Within this body of research on undergraduate student computer use the student body is typically treated as a homogenous group with a few exceptions. Students have primarily been classified and differentiated by either gender and/or prior computer interaction, occasionally controlling for age, race, and socioeconomic status.

Other potential factors should also be incorporated into possible social factors that may influence undergraduate student computer use including student income, peer group, first generation college status, cohort factors, and individual emphasis on the four major domains specified by the SERU21 study (academic engagement, intellectual/cultural engagement, social engagement, and civic engagement).

Possible Future Research Investigations

Past literature focusing on undergraduate computer use provide valuable insights towards possible future research investigations with University of California students. These areas include but are not limited to:

More Comprehensive Scope of Research Inquiry: Focus on student technology within the spectrum of education, specifically examining how students are utilizing and incorporating this technology into the four major domains of student experience developed by the SERU21 study (academic engagement, intellectual/cultural engagement, social engagement, and civic engagement). This would greatly extend the existing research that tends to limit the scope to frequency reporting and a few specific features or interactions.

Incorporate a Theoretical or Conceptual Framework: As discussed previously, implementing a theoretical or conceptual framework will provide a foundation to further extend prior and future research. Though at present there is not an immense amount of Internet-based social or behavioral theories, pre-Internet theories have the ability to apply to specific topics (i.e. life span perspective, social interaction theory, social exchange theory). In addition, current research could potentially incorporate a more exploratory component that may produce an applicable Internet-based theoretical or conceptual framework.

Valid and Representative Sample: Future studies should focus on the methodological component of gathering and obtaining a valid and representative sample. A comprehensive sample from University of California undergraduates across campuses could potentially provide valuable data in further understanding computer use and adaptation in the student experience not only in the UC system but to the broader field of higher education. In addition, this research would be able to provide in depth data on both specific campus (i.e. UC Berkeley campus leaders, UC Santa Barbara minority groups) and system wide groups.

Acknowledge Student Differences Including the Cohort Phenomena: Student differences should not be limited to strictly gender and previous technological interaction, other social factors should also be acknowledged and controlled for. This also includes the affects of cohort experience that further reinforces the role of historical and social contexts of each new birth cohort as they potentially age. This is pertinent when studying the fluid and continually changing nature of computer and Internet technologies.

The potential for gathering important and vital information on undergraduate student computer use in the University of California system is attainable. Analysis of past research has provided guidance and direction for future studies on this topic. Further research, if possible, should also incorporate technology within the methodological framework. It is important to note, past literature on student computer use were primarily administered via the traditional paper format instead of embracing and incorporating the technology within the method.   Though computer technology is continually altering, Martin Trow highlights on five major are that will potentially maintain existence through this transformation 1) speed of change and alteration, 2) ability to weaken and blur institutional and intellectual boundaries, 3) democratizing effects on higher and postsecondary education, 4) varying impact on academic subjects and kinds of education, and 5) the different ways that a wide range of students utilize these technologies. The student experience in the UC system and higher education in general will increasingly be shaped by their cohesion with computer and Internet technology.

References Cited

Aufderheide, P. 1999. *Communications Policy and the Public Interest: The Telecommunications Act of 1996.* New York: The Guilford Press.

Gurak, L. 1997. Persuasion and Privacy in Cyberspace. New Haven: Yale University Press.

Loader, B. (ed.). 1997. *The Governance of Cyberspace: Politics, Technology, and Global Restructuring*. New York: Routledge.

Owen, B. 1999. *The Internet Challenge to Television*. Cambridge: Harvard University Press.

II.   Undergraduate Student Computer Use Literature Review

Academic Computing Coordinating Council. 2001. "UC Davis Student Computer Ownership: Statement of Expectation." UC Davis.

The University of California Davis adopted the Student Computer Ownership Statement of Expectation that will be implemented during the Fall of 2001. This statement of expectation maintains that all incoming undergraduate students will have access to a personal computer that meet the following minimum criteria: 1) a word processing program, 2) a spreadsheet program, 3) an electronic mail (email) program, 4) a World Wide Web browser, 5) and be equipped with a CD-ROM. This need can also be potentially met to those who qualify by incorporating this expense into financial aid. This expectation recognizes the need for personal access to the specified computing features since UCD "has neither the financial resources nor the space to meet all of this demand with on-campus computer facilities" (p. 1); this is partially due to the increasing rates of courses that are utilizing these computers for instruction.

All University of California Conference. 1998. "Teaching and Learning Technologies: Present and Future." March 25-26, 1997. University of California Los Angeles.

The All-University Conference on Teaching and Learning Technologies and the Present and the Future of the University of California was comprised of representatives of the academic community (i.e. students, administrators, faculty) in March of 1997. The participants proposed a model with specific UC system wide technological standards. On the individual level these standards included: 1) support for faculty to develop technological courseware, 2) minimum technological competency requirements (both faculty, students), 3) release time available for faculty to further explore and learn new technologies, and 4) intellectual property policies. On the infrastructure level the following standards were proposed: 1) email, web access, and web authoring available to all students and faculty, 2) schedules for hardware and software replacement, 3) internal campus and UC system technological compatibility, 4) networked classrooms, 5) electronic library resources, and 6) networking to support data, video, and voice transfer at high speed levels.

American Association of University Women. 2001. "Book Review on The Third Shift: Women Learning Online." Authored by Kramarae, Cheris.

Approximately 500 men and women were surveyed on the positive and negative aspects of online learning in a study conducted by Cheris Kramarae, the American Association of University Women Foundation's 1999-2000 Scholar-in-Residence. This study cites that sixty percent of nontraditional online learners are women over the age of 25. Kramarae emphasizes the importance of investigating this social phenomenon, technology's impact on this nontraditional subgroup within education. The author found that the majority of virtual students have similar educational goals and aspirations

similar to traditional face-to-face students. Women reported high responses towards technological learning due to its flexibility, minimal costs, and educational outcomes (i.e. obtaining a degree, gaining knowledge). Nontraditional women reported that the virtual classroom "minimizes the discomfort and alienation they sometimes experience on college campuses" (p. 2). From the data analyzed Kramarai recommends to 1) involve more women administrators, faculty, and students in planning online courses, 2) expand financial aid programs to incorporate part-time students enrolled in distance education, and 3) extend information on distance learning to women.

Arias, Armando. 2000. "Agile Learning, New Media, and Technological Infusement at a New University: Serving Underrepresented Students." Julian Samora Research Inst. Occasion Paper. (http:/ /www.jsri.msu.edu/RandS/research/ops/).

Abstract: The California State University system faces an increase of 100,000 students by 2010, the majority of whom will be Latino. Fundamental restructuring is necessary to accommodate this change, and the new California State University, Monterey Bay (CSUMB) may provide a model. CSUMB has a commitment to serving underrepresented populations and establishing a multilingual, multicultural, intellectual community through the use of high-quality distance learning programs utilizing innovative pedagogies. Although CSUMB has entered into partnerships with private businesses that enable it to have the latest in educational technology, it is not the quantity of computers, but rather, new behavioral approaches to technological use that are absolutely necessary. CSUMB's approach to education emphasizes outcomes and competencies and replaces a credit-based system with the assessment of demonstrated learning. CSUMB findings concerning the high tech environment include: (1) advanced technology greatly augments regular classroom instruction and is a viable delivery system for multilingual teaching and learning and for distance education, especially in underrepresented communities; (2) computer messaging systems facilitate writing across the curriculum and greatly improve student writing and logical skills in multiple languages; (3) computer technologies support active, rather than passive, learning; (4) coupled with visual materials, thinking textually is sufficient to improve literacy even when a liberal attitude is taken towards grammar, syntax, and spelling; and (5) computer technologies promote participation and learning in traditionally communicative-apprehensive learners such as shy students, limited English proficient students, and women who avoid verbally confronting men.

"Campus Profile: University of California, San Diego." Cause/Effect Journal, Vol. 22, No. 3 1999.

This article provides an overview of the University of California San Diego including the IT organization and Supercomputer Center. The Administrative Computing and Telecommunications (ACT) oversees the university's approximately 60 computing labs that contain 1,200 multi platform computers. In addition, in 1999 there were 5,500 network ports available in undergraduate housing (1:1 student ratio) and 800 low cost dial-in modems available for other students. UCSD also has an Instructional Web Development Center that facilitates the development for web-based course materials

and technological support to faculty. The campus also maintains a Supercomputer Center that includes (in 1999) the largest computer system in an academic institution. These facilities provide support to other academic institutions and collaboration on projects with UCSD researchers.

Carswell, Linda; Thomas, Pete; Petre, Marian; Price, Blaine & Richards, Mike. 2000. "Distance Education Via the Internet: the Student Experience." *British Journal of Educational Technology*, Vol. 31, No. 1. Oxford: Blackwell Publishers.

The authors compare a distance undergraduate course taught exclusively through electronic communication to conventional distance learning courses for the same introductory Computer Science class. This study focused on two main areas: 1) to compare and contrast the experiences of the Internet students to the conventional group and 2) to identify ways that technology can improve distance education for students. The survey was administered to two groups, the Internet distance learning students (n=223) and conventional learning students (n=2,458). The Internet based group maintained exclusive group and one-on-one instructor contact solely through electronic communication (i.e. email, electronic news conferencing). The conventional learning group maintained contact through telephone, written contact and attendance to a small number of local tutorials. The gender and age ratios were similarly dispersed among the two groups (Gender: Internet female=23%, conventional female=20%; Age: Internet mean=37, SD=7.88, conventional mean=37, SD=8.61). In addition, a background questionnaire, learning style questionnaire, and final grades were collected from the participants to determine if differences with group self-selection would alter the outcomes. Overall, the Internet distance learning group was considered typical in gender, age, and academic performance to conventional students in this course. The Internet based participants did report a higher level of computer use in their jobs (Internet n=54, 91%; conventional n=52, 71%) and more years of computing experience (Internet mean=9.6, conventional mean=8.18).

Chandler, Beth; Maddux, Cleborne D. 1998. "Student Use of Instructors' Web Sites." SITE 98: Society for Information Technology & Teacher Education International Conference. Washington, DC, March 10-14, 1998.

Abstract: This descriptive research investigated issues relating to college students' use of instructor-created World Wide Web sites at the University of Nevada, Reno. Points of interest included student use of instructor Web pages and features found on a Web page perceived by students as most useful. Student use of instructor Web pages was identified by the amount of time students report they visit the Web site and their recollection of features found on the Web site. A survey consisting of 10 items requiring yes/no, multiple choice, and open-ended responses was designed to generate students' perceptions of the Web site in terms of ease of use, aesthetic appeal, navigation problems, and usefulness of provided information. A total of 249 completed surveys were returned. Results indicate that instructors are increasingly taking advantage of the resources made available through the Internet and are finding an interest in creating Web sites for their classes. Also, students as a whole seem willing and able to use

instructor-created Web sites. However, actual usage by students still seems elusive. Tables show descriptive data of participation, Web site visits by department, and survey questions and responses.

Chisholm, Ines Marquez; Carey, Jane; Hernandez, Anthony. 1999. "Access and Utilization of Computer Technology by Minority University Students." SITE 99: Society for Information Technology & Teacher Education International Conference. San Antonio, TX, February 28-March 4, 1999.

Abstract: Universities assume that entering students possess computer skills and literacy and then expect students to utilize these assumed skills by offering computer-based instruction, requiring research using the World Wide Web, offering online courses, and integrating computer usage into many courses. Universities seldom stop to determine if required competencies exist uniformly across all students. Literature has shown that computer access and integration of computers into curricula have been significantly lower in student populations from ethnic minorities in K-12 public schools. This study looks at access and utilization issues of students at an urban university across students of many different ethnicities to determine if discrepancies persist at the university level. Findings in the following areas are discussed: computer skills and training; computer access--hardware; computer access--software; computer access--Internet/e-mail; current computer use; classroom computer use; and computer perspectives. Based on the findings, several changes are recommended that will expand computer ownership, training, support, and modeling of professional use of computers.

Cotten, Shelia R; Hax, Heather. 2001. "Use of the Internet for Communication." Dept Sociology & Anthropology, U Maryland, Baltimore County

Abstract: The Internet is changing the way we work, live, & communicate with others. The present study examines how individuals use the Internet to communicate with others. We present the results of a series of eight focus groups with faculty, staff, & students at a mid-size public university in the Mid-Atlantic US. Results suggest that the Internet is influencing a variety of interaction patterns. On average, subjects report spending one to two hours on the Internet per day, they use it primarily for communication purposes, & email is the primary mode of usage. Issues of time, cost, efficiency, & geographical delimitations influence their usage of the Internet for communication. They report that communicating through the Internet has decreased their levels of phone contact but has not impacted their levels of face-to-face contact with others. One implication of this research is that the Internet is becoming a staple in terms of communication among both work & personal contacts. It appears that increasing usage of the Internet for communicating may have a direct impact on how information is delivered, relationships are developed & maintained, & individuals & groups interact with others.

Crook, Charles; Barrowcliff, David. 2001. "Ubiquitous computing on campus: Patterns of engagement by university students." *International Journal of Human-Computer Interaction*. Vol 13, No. 2, Jun 2001, p. 245-256.

Abstract: Describes basic forms of interaction between undergraduate students and computers that are ubiquitously present in their learning environment. 34 students' computers were systematically logged, documenting the time invested in computer use, the particular activities adopted, and the temporal patterns of use developed. Data reveal intensive periods of use. The content of activity was strongly biased toward more playful interests than the curricula agenda of the institution. This did not reflect unfavorable competition between the activity of study and other discrete activities such as computer games. Instead, the capacity of the desktop environment to provide strong distracting affordances for interaction and interruption was noted, sustaining a significantly mobile and multitasking style of engagement. It is stated that the versatility of ubiquitous computing creates tensions in relation to the activity system of private study. The same characteristics that empower research-led study practices also empower the pursuit of interests in distracting competition with the demands of learning and research. Moreover, study may demand ways of acting that are not consistent with the affordances of ubiquity.

D'Esposito, Joann E ; Gardner, Rachel M. 1999. "University Students' Perceptions of the Internet: An Exploratory Study." *Journal of Academic Librarianship*; Nov 1999, Vol. 25 No. 6, p. 456-61.

D'Esposito and Gardner examine university students' perceptions towards the Internet, Internet resources, and criteria utilized to evaluate online material. This preliminary study was conducted through two face-to-face focus groups comprised of 14 Monmouth University students. The participants were recruited through undergraduate and graduate summer school faculty via a sign-up sheet for student volunteers. Overall, 19 students signed up to participate, however 5 were disqualified during the initial screening questions: (1) Internet use for a paper within the past 5 months, 2) voluntary Internet participation, 3) library visitation for a paper within the past 5 months, and 4) major area of study that excluded computer science majors. Students' general perceptions of the Internet were positive, viewing it as a vast source of information. The participants reported using the Internet in their free time to communicate and locate friends and relatives, download music, and locate information on various subjects (i.e. performance schedules, sports, courses, scholarships, stocks, and consumer issues). The students reported using the Internet in conjunction with library resources (though the article does not specify virtual or face-to-face library resources) to complete assignments. In addition, the focus group participants reported mixed responses from faculty on using the Internet as a source (i.e. limited Internet use with traditional library sources, acceptable with proper documentation, prohibiting Internet sources). The authors identified three factors that determine if students will begin their research with the Internet or the library: 1) time (using the Internet first if they have only a few days to complete the assignment), 2) nature of the topic (humanities oriented would utilize the

library where the sciences and technology would use the Internet), 3) instructor's directives (if there was a personal preference from the faculty member).

Doll, Joerg; Petersen, Lars-Eric; Rudolf, Matthias. Medienpsychologie Zeitschrift fur Individual- & Massenkommunikation. Vol 12 (1), Mar 2000, pp. 5-22. Westdeutscher Verlag GmbH, Germany

Abstract: Studied the determinants of the Internet use of high school students and university students. 248 high school students (83 % female, 17 % male; mean age 17.2 yrs) and 125 university students (75 % female, 25 % male; mean age 21.9 yrs) in Germany were asked to complete a questionnaire using variables of the Theory of Planned and Role Guided Behavior (TPRB; Doll Bamberg & Six, 1999). Examined were the TPRB's assumption that the intention to use the Internet is a function of 3 personal factors (attitude, self-efficacy, and perception of behavioral restrictions) and of 2 social factors (subjective norm and role identity). Also tested was the assumption that Internet use is a function of 3 variables: the intention to use the Internet, the internal (self-efficacy), and external control factors (perception of behavioral restrictions). A linear structural equations modeling approach was used which simultaneously estimates parameters of a cross-sectional measurement model and a structural model. Results showed that attitude and role identity were the most important determinants of the intention to use the Internet. Intention and self-efficacy determined the use of the Internet. University students used the Internet more frequently than high school students and men more often than women.

El-Tigi, Manal Aziz-El-Din. 2000. "Integrating WWW Technology into Classroom Teaching: College Students' Perceptions of Course Web Sites as an Instructional Resource." Ph.D. Dissertation. Aug 2000. Syracuse University. 217 p.

Abstract: This study examined college students' perceptions of course Web sites as an instructional resource for classroom-based courses. The focus was on identifying functions on the sites that students perceived as supporting and fostering their learning experiences. Subjects were 142 students responding to a 60-item questionnaire and open-ended questions. Findings indicated an overall positive perception of the quality and usefulness of the course Web sites. On average per typical semester week, 64 minutes were spent on conducting searches on the Web, 40 minutes on downloading and printing material, and 34 minutes on communicating with faculty and teaching assistants. Highest ratings of instructional quality were on the visual appeal and readability of sites and the importance of the material on the site. Lowest were on the clarity and purposeful introductions to each segment on the site, clarity of the connection of each new section on the site with course objectives, and general taste in color of the pages. Highest ratings for perceived usefulness were on the use of visuals to recall or present new information and the opportunity to ask questions online. Lowest were the use of links to review/recall prerequisite material and instruction on how to navigate the site. Greatest barriers to use were access to computers and to Web site addresses, perceived in adequacy of their Internet skills, motivation to use the site, and time constraints. Greatest facilitators of use were guidance, quality of content,

availability of material, access to material, faculty, peers, teaching assistants, experts, and ease of communication. Overall impact of course Web sites was time saving qualities, 24-hour accessibility to resources, facilitating preparation for class, and increased understanding of class expectations and objectives. There appeared to be a negative relationship between residential distance from campus and perceived usefulness of sites and a possible relationship between courses and students' perceived instructional quality on functions related to clarity of purpose and objectives. Also, there appeared to be a general lack of motivation to use the sites, possibly due to their lack of mandatory use and what students reported as a lack of incentive to use them for specific course requirements.

Fichten, Catherine S.; Barile, Maria; Asuncion, Jennison & Judd, Darlen. 1999. "A Comparison of Postsecondary Students with Disabilities and Service Providers: Views about Computer and Information Technologies." Paper presented at the California State University-Northridge Annual Conference 14th, Los Angeles, CA, March 15-20, 1999. (http:/ /www.dinf.org/csun99/session0254.html)

Abstract: This report discusses a study involving 37 Canadian college and university students with disabilities and 30 Disabled Student Services (DSS) personnel that explored the use of computers in postsecondary education. Students were enrolled in community and junior colleges, universities, and postsecondary distance education institutions. Results indicated: (1) about half of the student sample had 2 or more impairments, suggesting the need for adapted work stations which can accommodate the needs of students with various disabilities; (2) in spite of their smaller numbers, students who are blind had the largest array of technologies at their disposal; (3) voice input software and scanners were found to be used not only by students with learning disabilities, but also by those who have a variety of impairments involving mobility and use of hands and arms; (4) service providers were using the Internet as a means of getting information about what equipment and adaptations are out there for students, and students were primarily teaching themselves how to use the equipment; (5) smaller institutions were less likely to have specialized computer technologies for their students; and (6) about half of the students surveyed did not know that funding programs existed to help them to obtain needed equipment.

Glick, Milton and Kupiec, Jake. 2001. "E=MC2: The Answer is Still Technology – Strategic Technology." In *Educause Review*, November/December 2001, p. 32-44.

Glick and Kupiec provide a discussion on the effectiveness of information technology within higher education, specifically focusing on if the university is meeting its strategic goal through technological investments. Overall, the authors concluded that strategic technology should improve student experience by providing greater time and space access, enhance learning, and build up the academic community. In addition, it should support student recruitment and reduce both staff and faculty demand. The authors analyzed and critiqued the uses of strategic technology in twelve areas of higher education. Thus far this strategic use has been beneficial in the following areas: 1) research enhancement, 2) information access, 3) student convenience, 4) overall

student experience (i.e. communicate with others independent of time and space, acquire supplementary materials, and cooperative learning). The authors identified that higher education with the incorporation of this technology is adequately meeting the following areas: 1) decision making (greater accessible information, nonuser-friendly technological tools that vary from institution to institution) and 2) teaching and learning (higher expectations of technological use, consumes more time of the instructor therefore is less cost efficient). Strategic technology is being inadequately met by higher education in the following areas: 1) cost containment, 2) people density (inflexible institutional budgets), 3) faculty time leveraged, 4) cost reduction, 5) return investment, and 6) the paperless office.

Goodson, Patricia; McCormick, Deborah & Evans, Alexandra. 2001. "Searching for Sexually Explicit Materials on the Internet: An Exploratory Study of College Students' Behavior and Attitudes." *Archives of Sexual Behavior*, Vol. 30, No. 2. Plenum Publishing Corporation.

This study was conducted to examine undergraduate user behaviors, outcome expectations and expectancies when searching the Internet for sexually explicit materials. College students (n=506) enrolled in the 1998 Spring and Summer upper-division undergraduate health class from an unspecified major public university were administered a traditional paper survey. From this population (41.6% Mexican American/Hispanic/Latino, 46.8% Non-Hispanic/White) 61.9% were female with a mean age of 25.21 (SD=5.85) and 63.6% of the participants were single (21.1% identified themselves as married). From this sample 74.4% of the participants utilized email and 90.1% used the Internet though the frequency of this use was not high for the majority of the students surveyed (40% use email less than once a week, 73% of the Internet). The survey indicated that men and women did not significantly differ on their email and Internet use or the frequency of this use. The authors reported that academic rank was also not statistically significant with these variables. Thirty-eight percent of the participants began to use the Internet over the last 2 to 3 years (began use the previous 6-12 months=34.3%; began use over 3 years ago=8.0%) (these statistics are similar for email use). A large proportion (47.4% of email users; 46.2% of Internet users) reported that they access this technology from a computer located on campus. The majority of participants utilize email and the Internet to communicate with family and friends (males=64.2%; females=70.2%), with 28.7% establishing new friendships online without prior face-to-face contact.

Green, Kenneth. 2001. "Campus Computing, 2000: The 11th National Survey of Computing and Information Technology in American Higher Education." March 2001. 38p. (http://www.campuscomputing.net)

Abstract: The 2000 Campus Computing Survey, the 11th such survey, was sent to the chief academic officer at 1,176 two-year and four-year colleges and universities across the United States. By October 2000, 506 responses had been received, a response rate of 43%. New data reveal that the growing demand for technology talent across all sectors of the U.S. economy poses significant staffing challenges for U.S. colleges and

universities. Respondents placed a high priority on personnel issues, and the survey data highlighted the gap in user support policies and services across all types of colleges and between the technology dependent /technology intensive campus and corporate communities. The survey data highlight the continuing challenge of information technology planning in higher education. Data suggest that there are gains in campus efforts to anticipate and plan for an array of critical information technology issues, but a careful look suggests that many of the plans may not be adequate. Overall there is more technology in the classroom, with 59.5% of all college courses using electronic mail, and 42.6% of courses using Internet-based resources. Almost one-third of college courses now have a Web page, and almost one-quarter of faculty members now have a personal Web page not linked to a specific class or course. Many more institutions now offer services on their campus Web site, as illustrated by the fact that 75.5% of the institutions participating in the survey provide online undergraduate applications. Two new survey items show great variations in campus police and practices on the issue of off-campus Internet access (ISP services) for faculty and students. Roughly two-thirds of public and private universities provide free ISP services for their students, but more than four-fifths of community colleges, roughly three-fifths of private four-year colleges, and almost half of public four-year colleges provide no ISP services for their students.

Horrigan, John; Rainie, Lee & Fox, Susannah. 2001. "Online Communities: Networks that Nurture Long-Distance Relationships and Local Ties."   Pew Internet & American Life Project (www.pewinternet.org)

The authors conducted a study with 1,697 Internet users to explore the nature of interactions among online communities, specifically individuals joining online communities (i.e. no geographic space) and individuals using the Internet to extend connections to their local physical communities. The results indicate that 84% of Internet users have contacted an online group (the authors term these individuals as "Cyber Groupies"). These Cyber Groupies are similar to the general Internet population however in this subgroup there are higher rates of individuals with a longer history of Internet use (more than 3 years), men with a college education or better, and younger individuals. The findings also indicated that online communities are comprised of a majority of active members (i.e. not passive "that lurk on email lists") but who interact with one another through online chat and email. However, it is important to note that Local Groupies (individuals using the Internet to extend connections to their local physical communities) have lower levels of this "chatter" (online chat and email) than cybergroups with no prior face-to-face interaction (Local Groupies use of email=38%; Non-Local Groupies use of email=60%). Cyber Groupies identified four primary reasons for emailing an online group: 1) getting general membership news and information (76%), 2) getting involved with or learning more about group activities (71%), discussing issues with others (68%), and 4) creating or maintaining relationships with others in group (49%). The survey also indicated that the Internet is a "bridge builder for younger members of online communities" (p. 19). Individuals between the ages of 18 to 24 indicated that the Internet helps them "a lot" or "some" to connect to

people of different generations (47%), different ethnic groups (42%), different economic backgrounds (36%), and groups in their local community (29%).

ITPG Information Technology Planning Group. "Student Survey." University of California Santa Barbara, Fall 1999.

The ITPG Information Technology Planning Group conducted a survey at UC Santa Barbara on the accessibility and capabilities of campus computer resources for students. A total of 2,728 surveys were gathered from 11 large classes and 4 computer laboratories on campus during the end of the 1999 Fall Quarter. From this sample 35% identified themselves as freshmen, 26% sophomores, 24% juniors, 14% seniors, and 2% graduate students. Seventy-five percent of the participants who have a personal computer at their local residence had access to a PC while only 18% had access to a Mac (a total of 79% have Internet access). From these computers 44% were less than 1 year old, 37% 1-2 years, and only 18% were 3 or more years old. The majority of students' access computers on campus other than residence halls at the library (57%) followed by an instructional computing facility (30%) or an academic department's own facility (8%). When asked to define the level of computing access this quarter 20% of students indicated "Excellent," 56% "Good," 22% "Adequate," and 3% "Poor." The main listed problems for computing access involved long waiting time/long lines to use the computers and computer malfunctioning (i.e. crashing, slow). Students were more likely to ask a fellow student for assistance (14%) followed by a consultant in an instructional computing facility (10%) or a TA (9%) (important to note only 4% of students would ask a faculty member). The students acknowledge the importance of computing to their success in their coursework (extremely important=64%, somewhat important=34%, not at all important=3%) and quality of education (extremely important=55%, somewhat important=43%, not at all important=3%).

Knox, David. 2001. "College Student use of the Internet for Mate Selection." *College Student Journal*. Special Issue, Vol. 35, No. 1, Mar 2001, p. 158-160.

Abstract: 191 never married 18-44 yr old undergraduate university students completed an anonymous 28 item questionnaire designed to assess their attitudes toward and involvement in use of the Internet to find a mate. The data revealed that friendship, not romance or sex, was the primary goal of using the Internet among these college students. Other findings included that over 60% of these respondents were successful in establishing an on line friendship, almost half said they felt more comfortable meeting a person on line than in person, and 40% reported that they had lied on line. Implications for university faculty, therapists, and students are suggested.

Kubey, Robert; Lavin, Michael & Barrows, John. 2001. "Internet Use and Collegiate Academic Performance Decrements: Early Findings." *Journal of Communication*; Jun 2001, Vol. 51, No. 2, p 366-82.

Kubey, Lavin and Barrows conducted a study on 572 (female=381; male=191) students at Rutgers University to determine if heavier recreational Internet use impaired

academic performance.   In addition, from the sample all most half (46.5%) were between the ages of 18 to 19 (93% between 18 and 22) and 90% were in their first 3 years of college. The participants were administered a traditional paper survey prior to the start of three courses (introductory journalism, media studies, and communication). A total of 9.26% (n=53) students agreed or strongly agreed that they might be psychologically dependent on the Internet (with more than double the time spent online in contrast to the sample mean).   Though two-thirds of the sample were female, approximately half (49%) of the self reported Internet dependents were male.   The results indicated that heavier Internet use was statistically correlated with impaired academic performance. This Internet-caused impairment was also correlated to lack of sleep, class absences, and loneliness.   However, these more often associated with greater use of all Internet applications (i.e. chat rooms, MUDs) than with individuals that primarily utilized this technology for email and newsgroups.

Kuenzi, Jeffrey J. 2000. "Trends in College Students' Computer Use and Ownership." *Journal of Educational Technology Systems,* Vol. 28, No. 1, p. 21-31.

Abstract: Examines data from three surveys of undergraduates at the University of Massachusetts, Amherst that were collected over a five-year period to uncover the nature and source of change in students' computer use and ownership. Results show personal ownership rising, use of word processing and email increasing

Kunderewicz, Larisa; Michener, Stacey & Chambliss, Catherine.   2001. "The Educational Impact of E-Mail: Extraverted versus Introverted Students." Pennsylvania: 143 Reports.

Abstract: College students (N=151) completed surveys assessing the relationship between e-mail use and extraversion. The variables studied included time spent on e-mail; the frequency of e-mail usage; and the purposes e-mail served for each student. The results suggest that extraverts use e-mail as a form of procrastination more than introverts, and that extraverts find e-mail to be more disruptive to their work. Introverts commonly prefer to stay within their own environment, and seem to use e-mail and the Internet primarily as a means of conducting research rather than as a means of participating in a more extensive communication network. Therefore, e-mail is not as distracting for introverted students. Although time spent on e-mail was not found to be significantly different for introverts and extraverts, the results suggest that this may be because introverts use e-mail regularly in completing academic assignments. Extraverts who are seeking greater companionship seem to make use of e-mail as a way of avoiding feeling alone.

Lubans, John Jr. 1998. "How First-Year University Students Use and Regard Internet Resources." Duke University Library.

Lubans conducted a study at Duke University focusing on how freshman utilize the Internet and their library information seeking patterns.   The survey indicated that students frequently use the web (85% use it at least several times a week); 20% or

n=47 use it more than once a day with women being less frequent users in this category than men. The participants indicated that their primary web learning resources are fellow classmates (44%) and general surfing (88%). When accessing resources 50% of the students indicated that they use the web 20% and the traditional library 80% of the time; 26% of the students indicated that they use the web and the traditional library 50/50 and 14% of the participants reported they use the web 80% and the traditional library 20% of the time. While the majority of students believe that the web helps in the number of sources found and saves time, they also indicated that it only has a modest influence on grades or the quality of their work.

McCoy, Leah P ; Heafner, Tina L ; Burdick, Matthew G & Nagle, Laura M. 2001. "Gender Differences in Computer Use and Attitudes on a Ubiquitous Computing Campus."   Paper presented at the Annual Meeting of the American Educational Research Association, Seattle, WA, April 10-14, 2001.

Abstract: As colleges and universities consider various options for wide scale "computerization," one southern liberal arts university has instituted a technology program that insures that all students have equal access to laptop computers. At this university, each student is issued his or her own IBM ThinkPad, and activities involving this computer are infused throughout the academic and social life of the campus. This study examined the computer uses and attitudes of male and female students who had experienced a technology-rich environment for four years. Participants in the study were students in the Class of 2000 at this ubiquitous computing university. Approximately 800 students were surveyed near the end of their senior year to obtain their self-reports of computer use and computer attitudes. Overall, use data indicated that students used the computer in various ways. Students reported that they used the computer "often" for: word processing (97%); e-mail for pleasure (98%); e-mail for classes (73%); and Web resources for classes (50%). For further analysis, the frequency of individual use was added and the following categories were created to form scores: Tool; Communication; Resources; Entertainment; and Total Use. These categories of use were compared for males and females using independent T-tests. Results showed that males were more frequent users in the categories of Resources, Entertainment, and Total Use. There were no significant differences for Tool Use or Communication. On the attitude survey items, 73% of the students reported that they "loved" computers, while 23% "liked" them, 4% "disliked" them, and 1% "hated" them. Eighty-three percent of the seniors felt that the ThinkPad had significantly impacted the campus culture, 75% felt that it had helped in their overall educational life, and 48% felt that it had helped in their overall social life. Responses on all of these attitude items were independent of gender.

McEuen, Sharon. 2001. "How Fluent with Information Technology Are Our Students?: A survey of students from Southwestern University explored how FIT they see themselves." In *Educause Quarterly*, No, 4, p. 8-17.

Through a survey conducted at Southwestern University, McEuen explored how knowledgeable students are towards information technology.   Overall, three hundred students participated in the web-based survey that concluded with a request to

participate in a personal interview on the topic (n=17; 40 volunteered, 20 were randomly selected to participate). Ninety-seven percent of the respondents reported that they owned a personal computer. Females reported that they utilize the computer for communication 48% of the time and schoolwork 35.3% and were more likely to ask for assistance (primarily through peers). Males in contrast used computers for entertainment 44% of the time and schoolwork 25.8% of the time and were more likely to troubleshoot a problem themselves or utilize online references for help. Overall, the results indicated that students want to use the Internet for file sharing, communication, and academic purposes yet lack information on Internet structure and database systems (i.e. computer security, copyright issues, electronic viruses, how email and data are transmitted). The follow up personal interviews revealed that high school experience with computers primarily focused on basic skills such as email, Internet browsing, and word processing with little to no interaction with spreadsheets, databases, networking, or creating web pages.

McFadden, Anna. 1999. "College Students' Use of the Internet." *Education Policy Analysis Archives*, Vol. 7, No. 6.

This study focused on the nature of student Internet use in an on campus computer lab at an unspecified major state university. The researcher randomly selected 6 computers in an open access computer lab comprised of 67 computers. McFadden traced the web "hits" from each of these designated computers through initially copying the cache for each terminal. Overall, there were 2,310 Internet "hits" between the 6 computers: General (i.e. course activities, research, personal interest)=47% (n=1094), Mail=28%, Chat=133, Search=6%, Sports=6%, Course Sites=4%, News=1%, Sex=1%, Games=0% (n=2), and Radio=0% (n=3).

Mitra, Ananda; Steffensmeier, Timothy. 2000. "Changes in Student Attitudes and Student Computer Use in a Computer-Enriched Environment." *Journal of Research on Computing in Education*; Spr 2000, Vol. 32, No. 3, p. 417-33.

Abstract: Examines the pedagogic usefulness of the computer by focusing on changes in student attitudes and use of computers in a computer-enriched environment using data from a longitudinal study at Wake Forest University. Results indicate that a networked institution where students have easy access can foster positive attitudes.

Mitra, Ananda; Lenzmeier, Stefne; Steffensmeier, Timothy; Avon, Rachel; Qu, Nancy & Hazen, Mike. 2000. "Gender and Computer Use in an Academic Institution: Report from a Longitudinal Study." *Journal of Educational Computing Research*; Vol. 23, No. 1, p. 67-84.

Abstract: Explores the nature of the relationships between gender, categories of computer use, and attitudes toward computers in a computer-enriched university environment where students had network access and laptop computers over a four-year period. Results indicate women were less positive about computers than men and their use levels were less frequent.

Newby, Michael and Fisher, Darrell. 2000. "A Model of the Relationship Between University Computer Laboratory Environment and Student Outcomes." *Learning Environments Research,* Vol. 3, p. 51-66.

Newby and Fisher conducted a study with 208 students enrolled in courses involving a laboratory at the Business School of Curtin University of Technology in Western Australia. The researchers explored the relationship between the environments within campus computer laboratories and student outcomes. The data provided evidence that the laboratory environment a student is in has a statistically significant association towards the student's attitudes towards the course and computers in general however student achievement was not affected. The results also indicated, that positive student perceptions towards the usefulness of computers increased an individual's enjoyment and reduced their anxiety within the classroom. Overall, the authors stress the importance of creating a positive computer environment for students.

Nice, Mathew. 1998. "Internet romances: The frequency and nature of romantic on-line relationships." *CyberPsychology & Behavior*, Fall 1998, Vol. 1, No. 3, p. 217-223.

Abstract: One thousand university students (graduates and undergraduates) were e-mailed a survey about relationships they had established on the Internet. Of the 248 who returned the survey, 88 (36%) indicated they had formed a friendship with another individual in an on-line setting, 19 (22%) of who described it as a close romantic relationship. These 19 Ss were e-mailed a 2nd survey concerning various aspects of their romantic relationship. The frequency of romantic on-line relationships in the university population investigated was determined to be .0766, or 76 per 1,000 students. The 12 Ss (mean age 22.75 yrs) who returned the 2nd survey rated their on-line relationship as equal to or superior to those they had established off-line on measures of strength, satisfaction, and ease of communication. The findings were discussed in terms of those features of computer-mediated communication that can facilitate the development of close relationships, as well as their implications for contemporary theories of relationship formation.

Odell, Patricia; Korgen, Kathleen; Schumacher, Phyllis and Delucchi, Michael. 2000. "Internet Use Among Female and Male College Students." *CyberPsychology & Behavior*, Vol. 3, No. 5, p. 855 – 862.

Abstract: A review of the recent literature concerning Internet usage among Americans reveals that the once stark gender gap is closing rapidly, but disparities remain in the purposes for which males and females use the Internet. Almost all of this research, however, is based on cross sections of American adults. Much less Internet research has focused on the college student population and, in particular, on female students; the few published studies show that female college students use the Internet less than males. However, even these recent studies may already be dated. This study, based on a large survey of college students from institutions of higher learning in Georgia, Hawaii, New Jersey, Massachusetts, and Rhode Island, considers these questions: (1) Has the

gender gap in Internet use narrowed among college students to the same extent as it has in the general adult population? (2) Do female students differ from males in how they spend their time on the Internet? (3) Does family income, parental education or type of college influence female college students' use of the Internet? Results indicate that while the gender gap in use of the Internet has nearly closed, differences still remain in how male and female undergraduates use the Internet.

Ofosu, Helen Bontu. 2001. "Heavy Internet use: A proxy for social interaction." Dissertation Abstracts International: Section B: The Sciences & Engineering. Vol 61(9-B), Apr 2001, p. 5058.

Abstract: In this study Internet dependent and non-Internet dependent university students were compared in terms of their levels of perceived social support, self-esteem, shyness, loneliness, gender, and level of dissociation. Two hundred and eleven undergraduate students enrolled in a first year Communications Studies course offered at a university in Southwestern Ontario agreed to participate in a study about their Internet use and their leisure and social habits. Students responded to a survey consisting of the following measures: an Internet and Personal Computer (PC) Use Scale, an Internet Dependence Scale, an abbreviated Perceived Social Support Scale, the Texas Social Behaviour Inventory, the Revised Shyness Scale, an abbreviated Social and Emotional Loneliness Scale, a Dissociation Screen, and demographic items. On the basis of the Internet Dependence Scale, 20% of the participants were classified as Internet dependent and 80% were classified as non-Internet dependent. As hypothesized, Internet dependent students were more likely to be male than female, perceived less social support from their friends and family, but perceived more social support from their Internet friends than did non-Internet dependent students. Also as predicted, Internet dependents demonstrated more shyness, more social loneliness, and more dissociation than did non-Internet dependents. The implications of the findings of this preliminary study are discussed and future research directions are identified.

Perry, Timothy T; Perry, Leslie Anne; Hosack-Curlin, Karen. 1998. "Internet Use by University Students: An Interdisciplinary Study on Three Campuses." *Journal of Internet Research*: Electronic Networking Applications and Policy Year: Vol. 8, No. 2, p. 136 – 141.

Abstract: This study sought to determine if differences exist among various age groups regarding students' use of the Internet. Surveys were administered to 548 students from three regional universities in the southeastern USA. Survey responses were then analyzed to determine how many students regularly use the Internet, how many hours per week regular users spend on the Internet, and what computers they use. Information was also tabulated for use of e-mail, use of the Internet to obtain university information, and for the number of students who had home pages. Finally, survey responses were analyzed to determine which students: consider the Internet to be a fad; project their future use of the Internet to be less, the same, or more than now; and project they will use the Internet in their chosen careers.

Phipps, Ronald & Merisotis, Jamie. 1999. "A Review of Contemporary Research on the Effectiveness of Distance Learning in Higher Education." Prepared for American Federation of Teachers and the National Education Association. April 1999.

Phipps and Merisotis critically analyze the existing research on the use of distance learning in higher education specifically focusing on the assessment of the quality of past research, gaps or omissions from previous studies, and the overall implications of the research concerning this topic. The effectiveness of distance learning has primarily been measured by student outcomes (i.e. grades, test scores), attitudes about this form of education, and overall satisfaction. The authors highlight on four major shortcoming that have resulted from this approach: 1) lack of controlling for extraneous variables, 2) majority of studies do not utilize random sampling, 3) lack of instrument validity, and 4) lack of controlling for individual feelings and attitudes. In addition, seven areas that past research on distance education has failed to cover include: 1) emphasize individual course outcomes rather than a complete program, 2) lack of consideration of student variability, 3) lack of explanation for the higher drop-out rate, 4) the relation of different learning styles, 5) focus on individual technologies instead of the multiple technologies utilized, 6) lack of theoretical or conceptual framework, and 7) inadequate coverage of the impact of digital libraries.

Plant, Richard. 2001. "The Future of Technology at UC Davis." In UC Davis Information and Educational Technology News. January/February 2001.

The Academic Computing Coordinating Council and the Administrative Computing Coordinating Council at the University of California Davis highlight on three technological projects that will improve teaching, studying, doing business, and recruiting students. The first project is MyUCDavis, a web portal that will provide personalized access to the Internet for students, faculty, and staff. The second project is exploring the potential for a campus course management system that will provide expanded access to course information and correspondence via the Internet. The final project focuses on the E-Recruitment Project (that has been funded for two years) to provide personalized information to potential students. The authors highlight that currently no other directly competing university to UCD currently uses this form of technology. The Academic Computing Coordinating Council has also recently developed the Student Computer Ownership that will be implemented beginning in the Fall of 2001 (See Academic Computing Coordinating Council Reference).

Rickman, Jon and Grudzinski, Mike. 2000. "Information Technology Use in the Classroom." In *Educause Quarterly*, No. 1, p. 24-30.

Rickman and Grudzinski report the results of a survey on faculty and students conducted at Northwest Missouri State University that focuses on student expectations towards information technology use in the classroom. The survey was comprised of 1,682 students (72% response rate) and about 60 faculty responses (100% response rate) from nine academic departments. The results indicated: 1) students do not want

IT used 100 percent of the time but do want some usage in all areas, 2) students appear to want IT for less than 50 percent of the classroom activities, 3) the percent of time students thought IT should be used coincided with the actual percent faculty were using IT, 4) for classes that students perceived that IT use was less than 40 percent, students wanted more and in classes were perceived actual usage was greater than 40 percent, they desired less, and 5) the average percent time students thought IT should be used is 40 percent. Students generally reported that technology is helpful, only 3 percent thought no technology would be helpful (Power Point and the document camera were the most helpful items indicated by the students and faculty). The authors also concluded: 1) that faculty must be trained or support personnel must be close by, 2) students were very taken back by class time lost because the professor did not know how to operate the equipment, 3) technology must help or aid in the teaching, not overpower it, 4) readily available equipment promotes usage, 5) students like easily readable power point presentations and when they are posted to the web so they can be downloaded at the students convenience, and 6) students preferred the use of a document camera over traditional board writing.

Sax, Linda J ; Astin, Alexander W ; Korn, William S & Mahoney, Kathryn M. 2000. "The American Freshman: National Norms for Fall 2000." California Univ., Los Angeles. Higher Education Research Inst. American Council on Education, Washington, DC. Dec 2000.

Abstract: This 35th annual report of national normative data on college freshmen is part of the Cooperative Institutional Research Program (CIRP) longitudinal study to assess the effects of college on students. The freshman data reported here are weighted to provide a normative profile of the U.S. freshman population for use in policy analysis, human resource planning, campus administration, educational research, and guidance and counseling. The data are reported separately for men and women and for 26 different institutional groupings. The major stratifying factors are institutional race (predominantly white versus predominantly black), institution control (public, private, nonsectarian, Roman Catholic, Protestant), institution type (university of four-year college), and the selectivity of the institution. The norms for 2000 are based on the responses of 269,413 students at 434 baccalaureate colleges and universities. An overview identifies major trends, which include: (1) the gender gap in computer use; (2) election year interest in politics; (3) student concerns with "status"; (4) study time and grades; (5) alcohol and cigarette use down; (6) declining interest in health careers; and (7) opposition to death penalty and support for gay rights.

Schumacher, P.; Morahan-Martin, J. 2001. "Gender, Internet and Computer Attitudes and Experiences." *Computers in Human Behavior*, Jan 2001, Vol. 17, No. 1, p. 95-110.

Abstract: Explores whether gender and Internet and computer experience, skills, and attitudes are related using evidence from 2 studies of incoming college students. Surveys concerning computer use and attitudes were administered to 619 incoming undergraduate students in 1989/90. In 1997, the survey was again administered to 225 incoming 1st year students, this time including questions assessing Internet and e-mail

use and attitudes. Significant gender differences were found in many computer experiences and attitudes of Ss in 1989/90. By 1997, Ss were more experienced with using a computer than the earlier Ss. However, gender differences in computer experience and skill levels had diminished in some areas. Results also show that Ss had more exposure to computers than to the Internet. Males were more experienced and reported higher skill levels with the Internet than females, with the exception of e-mail. The overall competency and comfort level for students in 1997 was significantly higher for computers than for the Internet. Competence and comfort levels with the Internet and computers were highly intercorrelated and both predicted Internet skills and experiences.

Serban, Andreea M.& Spaulding, Scott. 2001. "Student College Experiences Survey." Prepared by the Office of Institutional Assessment, Research, and Planning within Santa Barbara City College. Spring 2001, 41p

Abstract: The Student College Experience Survey of Santa Barbara City College (California) is intended to determine students' levels of satisfaction with various aspects of the college life, including environment, instruction, and services. The survey also aims at determining student characteristics not available from the data collected through the student information system, such as ownership and use of computers, e-mail and Internet access, participation in out-of-class activities, and preferences for course scheduling and location. More than 1,000 students replied to the survey--a 58% response rate. Report highlights include: (1) eighty percent of the respondents were employed, 56% at least 20 hours/week; (2) of the students who were employed, 46% reported that their job was not related to their major and 29% reported that it was related or somewhat related; (3) the majority of the students expressed a high degree of satisfaction with the quality of the instruction, relationships with faculty and faculty availability, course offerings, support services, and the learning environment at the college; (4) eighty-two percent of the respondents owned a computer (compared to 63% in 1997); and (5) computer ownership did not vary by gender but some variations did occur by age and ethnicity, with younger students owning a computer at higher rates than older students, and Filipino and Hispanic students owning a computer at lower rates than the other ethnic groups.

Sherman, Richard; End, Christian; Kraan, Egon; Cole, Alison; Campbell, Jamonn; Birchmejer, Zachary & Klausner, Jaime. 2000. "The Internet Gender Gap Among College Students: Forgotten But Not Gone?" *CyberPsychology & Behavior*, Vol. 3, No. 5 p. 885 – 894.

Abstract: The Internet has been a male-dominated technology since its beginnings in the late 1960s. A number of studies have reported that the gap between the numbers of men and women online has narrowed in recent years. However, broad definitions of usage have often masked important differences in how much the technology is used in specific ways, as well as qualitative differences in men's and women's experiences in using the Internet. One area in which such differences might be particularly important is in higher education, where Internet activities are increasingly a central feature of the

curriculum in a variety of departments. We investigated the Internet gender gap among college students by comparing the usage patterns and attitudes of three cohorts of students in 1997, 1998, and 1999. In addition, we examined longitudinal changes from 1997 to 1998 in a subsample of our participants. The cohort comparisons revealed gender differences in five Internet activities (E-mail, World Wide Web [WWW], Usenet, Multiuser dungeons [MUDs], and chat groups) with no significant lessening of these differences over time. Attitudes toward the technology also differed between men and women and these differences also did not change over time. The longitudinal data showed similar patterns. In general, our investigation suggests that differences continue to exist between college men and women in how they experience Internet technology and assessments that the Internet will soon be gender neutral are perhaps premature.

Shoemaker, Judy & Franklin, Stephen. 1998. "Informatics Readiness Survey." University of California, Irvine, Summer 1998.

The University of California Irvine conducted a study on 1,634 incoming freshmen to assess their readiness to utilize computer-based resources for academic purposes during the summer of 1998. The survey focused on six primary domains: 1) the types of personal computers students are planning to bring to campus; 2) their plans for connecting to the Internet; 3) how often they use a computer for various types of tasks (i.e. word processing, email, and the Internet), 4) how comfortable and confident they are using computers, 5) their preferred methods of learning about computers and software applications; and 6) the types of computer training they would like to have when they come to UCI. This survey was distributed through during the freshman academic advising process and received an approximately 50% response rate. The Informatics Readiness Survey was designed for comparison with a 1995 survey that was conducted by UCI. From the responses reported:

1. Personal Computers: 1) 69% freshman planned on having a personal computer their first year, 2) 79% of freshman planning on having a computer will use IBM-type PC's
2. Internet Connectivity: 1) 59% of the new freshman currently had an ISP and 11% were plan to get one
3. Frequently Used Computer Applications: 1) 89% use a computer for word processing at least once a week, 2) 89% of new freshmen have accessed the web at least once, 63% access the Web at least once a week, 3) 79% of new freshman have used email at least once, 60% use email at least once a week, 4) 19% of new freshman have created a web page, including 4% who have created web pages frequently
4. Confidence Using a Computer: 1) 78% agreed or strongly agreed that "in general, computers are easy for me to use"
5. Preferred Methods of Learning about Computers and Computer Applications: 1) 84% prefer to learn from friends, 2) 64% prefer to learn as part of a course
6. Types of Computer Training: 1) 57% would be likely to attend training on how to use the online catalogs of the UC libraries, 2) 53% of new freshman would be likely to attend training on how to access UCI email and other Internet and

computer services, 3) 52% would be likely to attend training on how to create web documents

7. Comparison to 1995 survey center: 1) In 1995, 66% of new freshmen planned to have a computer their first year, 2) from those freshman 68% planned on using an IBM-type PC, 3) 68% agreed or strongly agreed that "in general, computers are easy for me to use"

Silver, David. 1998. "Cyberculture: An Annotated Bibliography." RAND Publications.

Silver provides a literature review of twenty-five sources on virtual communities, cyberculture in context, community networks and virtual identities. These articles, essays and books provide information and evidence of virtual identities that have emerged that in return shape and form virtual communities online. These virtual communities are identified as "social aggregations that emerge from the Net when enough people carry on…public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace" (p. 4). This literature review identifies the debates between the benefits, potential, and applications of cyberculture, in addition to defining its parameters. The ability of online technological communication to create and extend face-to-face community networks is also discussed.

Trow, Martin. "Some Consequences of the New Information and Communication Technologies for Higher Education." The Goldman School of Public Policy and the Center for Studies in Higher Education. University of California, Berkeley.

Trow provides a conceptualized discussion on the impact of technology in higher education. The author stresses the fluid and ever changing nature of computer and Internet technologies, therefore, he highlights on the characteristics that will likely "survive changes in technology itself" (p. 1). The information and communication technologies' five major areas of focus are: 1) speed of change and alteration, 2) ability to weaken and blur institutional and intellectual boundaries, 3) democratizing effects on higher and postsecondary education, 4) varying impact on academic subjects and kinds of education, and 5) the different ways that a wide range of students utilize these technologies. Martin also identifies the importance of analyzing the social psychological factors of learning with technology in order to further understand and enhance education with this tool.

University of California, San Diego. 1998. "Technology In Undergraduate Education." UC San Diego Self Study, Chapter 6.

The University of San Diego conducted a self-study that focuses on the use of technology in undergraduate teaching and learning. Student access to equipment and software, Section E3, provides an overview of both the policy and access students have with computers. The study estimates that approximately 60 to 70 percent of students have a personal computer. However, at the time that this document was created, 1998, the university did not mandate incoming students to have a computer. Academic Computing Services has argued against this mandate for freshman, since "it makes no

sense to mandate that an incoming freshman purchase a device that will be outdated by the time the student is a junior or senior and using computing at a much greater level" (p. 13). Each student receives a computer account after submitting the intent to register form, this includes an email address, file storage, software, Internet access and access to open computing labs. During 1998 the UCSD Academic Computing Services maintained over 60 instructional computing labs containing over 1,300 computers. Students can directly connect to UCD's computer services by the university's work stations, an Ethernet card in on-campus housing or residence halls, or through a "modem pool" that allow off-campus students to dial in directly with a $10 per month charge. Currently all on-campus undergraduate housing has one network port per student available that is wired directly to campus (5,8000 connections). The self-study reported that there is a need to establish university funds for computing equipment and facilities for students with disabilities.

Warger, Thomas. 2000. "Perspectives on Privacy in Campus IT." Ubiquity: An ACM IT Magazine and Forum.

Warger provides a discussion on student, faculty, and institutional issues at the university level regarding online privacy. The author highlights on four major topics that have currently surfaced for students causing some level of controversy in the university 1) student uneasiness with college staff over intellectual property, 2) accessing pornography over campus wide computers (private network browsing that leave traces behind), 3) access to online library circulation records, and 4) lessened privacy in distance education.

Wegner, Scott; Holloway, Den and Garton, Edwin. 2000. "Student Achievement in a Distance Learning Environment." In *Educause Quarterly*, No. 1, p. 54.

Wegner, Holloway and Garton conducted a study of the effects of Internet-based distance learning on student achievement and attitudes. The sample was comprised from graduate students at Southwest Missouri State University that were self-selected into either an Internet-based section or a traditional classroom section that spanned a 16-week course. The Internet group received contact with the instructor and class through electronic interaction with the exception of one initial meeting to provide Internet use training. Student achievement was assessed through an identical 100-point exam administered during the 15th week of class to both groups. The mean score of the experimental group was 91.57 and the 92.46 for the control group (traditional face-to-face course). The results from this test indicated that the control group obtained the highest scores, however, the test scores from the experimental group were the most consistent. Student perceptions were gathered through exit surveys and course evaluations. Overall the students in the Internet-based group reported a more positive feeling towards the course in comparison to the control group. The positive comments provided by the control group focused on the level of knowledge and experience of the course instructor. In comparison, the Internet-based group's positive comments focused on learner efficacy issues, group problem solving skills, and communication skills.

Yahoo! "Internet Life: The College Issue. UC Berkeley: Berkeley, California." (www.yahoo.com)

Yahoo Internet Life provides information on the University of California Berkeley on four areas: hardware and wiring, academics, student affairs, and social services. In the hardware and wiring domain this site reports that 1) 75% of UCB students own computers, 2) there is a 3:4 computer port to student ratio, 3) students automatically receive an email account through the university, 4) UCB does not automatically provide server space for a personal website, and 5) restricted connection to campus from a student's own computer. The academic section provides information on the following: 1) 40% of classes have web pages, 2) 40% of classes have online study aids, and 3) there is no mandatory Internet training. Student affairs domain reports that students have online access to registration, adding and dropping a course, transcripts and syllabi. In the social services domain this site reports: 1) 60% of students have web pages, 75% of campus clubs and organizations have web pages, 2) the school does not sponsor online gaming, chat or dating services, 3) there are no popular campus online hangouts, and 4) there is a newsgroup hierarchy. Though these statistics on UC Berkeley can provide a guideline or overview of the campus the validity of this information should be checked.

Yahoo! "Internet Life: The College Issue: UC Davis: Davis, California." (www.yahoo.com)

Yahoo Internet Life provides information on the University of California Davis on four areas: hardware and wiring, academics, student affairs, and social services. In the hardware and wiring domain this site reports that 1) 75% of UC Davis students own computers, 2) students automatically receive an email account through the university, 3) UCD does not automatically provide server space for a personal website, and 4) students can connect to campus from their own computer. The academic section provides information on the following: 1) 95% of classes have web pages, 2) 25% of classes have online homework, and 3) there is no mandatory Internet training. Student affairs domain reports that students have online access to registration, adding and dropping a course, transcripts and syllabi. In the social services domain this site reports: 1) 50% of students have web pages, 90% of campus clubs and organizations have web pages, 2) the school does not sponsor online gaming, chat or dating services, 3) there are no popular campus online hangouts, and 4) there is a newsgroup hierarchy. Though these statistics on UC Davis can provide a guideline or overview of the campus the validity of this information should be checked.