AN ABSTRACT OF THE THESIS OF

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The major objectives of this study were to ascertain if certain ethnic and racial groups of first-year Oregon State University students are without access to online admission materials, and to determine what students' point of view are about computer access or applying to Oregon State University online. In addition, the demographics of the 1999 – 2000 Oregon State University class (online vs. paper applications, ethnicity, gender and age distribution) were analyzed.

Despite the growing numbers of students utilizing technology in the admission process, the first part of this study has shown that female students, underrepresented students, and non-traditional students at Oregon State University, during the 1999 – 2000 academic year, still do not utilize the electronic application process as much as their majority counterparts. In general, the online application process at Oregon State is being underutilized since only 18.6% (98 out of 528) of students applied via the web.

Lastly, although students varied in technological abilities before coming to Oregon State University, all 48 students during the one-on-one telephone interview stated that they had utilized a computer and online services (either in their room, a friend's computer, the library, etc.) the day of the interview. This leads Oregon State University to believe it is successfully integrating students into technology. Some of this is occurring by web registration, online access to the Valley Library (students are able to complete a good portion of their research without leaving their rooms), and instructors are developing webpages where students can retrieve assignments, course syllabi, class readings, notes, and more information regarding a particular course.

Students demand access to these technologies in order to gain the knowledge and skills they need to compete in the job world. Admission professions working in institutions of higher education have the responsibility to meet this need. With leadership by admission representatives in areas of planning, implementation, and campus-wide collaboration, information technology can significantly improve student learning and change the way in which students are educated for years to come.

Increasing the Digital Divide:

The Online College Application Process

by

Loredana L. Werth

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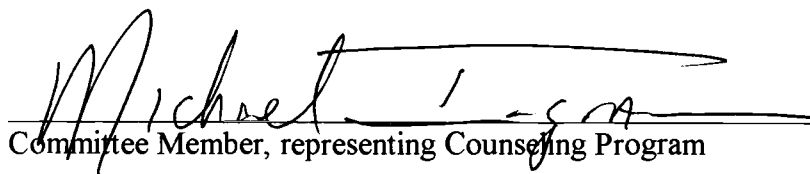Redacted for Privacy

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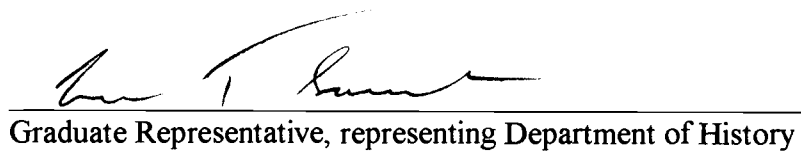
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CHAPTER 1

INTRODUCTION

As we enter the twenty-first century, surfing the Internet is becoming an

everyday experience for increasing numbers of Americans. More than 40 million

people made use of the Internet between 1996 and 1997 (Kohl, 1996). Currently, over

110 million hosts are connected to the Internet worldwide (The World's Online

Populations, 1999). By the year 2002 it is predicted that over 490 million people

around the world will have Internet access—that is 79.4 people per 1,000 worldwide

(The Computer Industry Almanac, 1999). While we are encouraged by the dramatic

growth in the access Americans have to the nation's information technologies, the

growing disparity in access among certain racial groups and regions is alarming

(National Telecommunications and Information Administration, 1999). A digital

divide between Whites and ethnic minorities, urban and rural communities, and the

wealthy and poor in the United States exists. If this digital divide widens, the

consequences to American society are expected to be severe (National

Telecommunications and Information Administration, 1999).

When the Clinton Administration launched the National Information

Infrastructure Task Force in September of 1993, the initiative was promoted as

something to provide "all Americans with access to information and to communicate

with each other using voice, data, image, or video anytime, anywhere" (Information Infrastructure Task Force, 1993). At this time, we are a long way from the goals the Clinton Administration originally set out to accomplish. The Internet may provide equal opportunity, but only for those with access (Hoffman & Novak, 1998a). The gaps between White and Hispanic households with access and between White and African-American households are now more than six percentage points higher than they were in 1994 (National Telecommunications and Information Administration, 1999).

The Internet provides research opportunities for many individuals and also provides a means for students to inquire about college and university admission. A number of higher education institutions have recently devoted new attention to their Web sites, replacing their early designs with slick, professional looking sites (McCollum, 1999). Colleges and universities are improving their Web sites because they are currently a determining factor in whether a student decides to attend a particular institution (McCollum, 1999). With the dwindling of home pages run by students or volunteer network technicians, Web sites are now being professionally designed to market the institution to prospective students and their parents. Many colleges and universities have introduced procedures to apply for admission through the Internet. Applications are now being completed on Web sites and submitted with the click of a button (McCollum, 1999).

Besides applications, colleges and universities are making online open houses available to offer live chats with students, professors, or presidents (Guernsey, 1998c).

E-mail newsletters, instant-messaging groups, and virtual campus tours are just a few examples of how colleges and universities are developing their own online recruiting strategies. The use of technology in the field of admission is a critical key to unlocking the door to successful learning (Guernsey, 1998b). However, if there are differences in terms of computer access among racial and ethnic groups, who applies to college electronically and who applies using the paper-based option?

Investigation into computer access between ethnic and racial groups is greatly needed in the United States. Although a great deal of research has been conducted attempting to minimize the *"digital divide"*—those with access to new technologies versus those without access—little is known as to how the online college application process affects this divide. As technology in the area of college admission moves forward, and more application processes occur online, we need to examine how access to these materials can be utilized by all ethnic groups.

Statement of the Problem

As enrollment management offices begin marketing online services to their prospective students this next year, admission personnel need to prepare for those groups of students who do not have access to their online services. To use computer-based technology, students must have access to a computer with a processor of sufficient power and speed to support Internet services, opportunity to spend time on a computer, and knowledge about how to use a computer. In order to be able to use many of the opportunities the Internet provides, equal opportunity and access must be

made available to students regardless of ethnicity, income, geographic location, or education level. Ultimately, the ability of higher education to provide quality learning for all students in a high-tech environment is a matter of planning for technological equity and equality.

The Research Question

As technology in the area of college admission moves forward and more application processes occur online, are certain ethnic and racial groups of first-year Oregon State University students without access to these online materials? What are the effects for first-year Oregon State University students who may be left without access to online admission application materials?

Related Questions

There is a great deal of statistical information concerning computer access in the United States and around the world, but what is the student's point of view? What do first-year Oregon State University students of different racial and ethnic backgrounds think about accessing online application information? What are the demographics of the 1999 – 2000 Oregon State University class in terms of online applications vs. paper applications, ethnicity, gender and age distribution?

Definitions of Terms

For the purpose of this study, certain terms are used as follows:

African-American: A race/origin category used that consists of persons who identified their race as "African-American," but did not identify themselves as being of Hispanic origin or descent.

AIEA: A race/origin category used by the Census Bureau that consists of American Indians, Eskimos, and Aleuts (National Telecommunications and Information Administration, 1999).

API: A race/origin category used by the Census Bureau that consists of Asian or Pacific Island Descent (National Telecommunications and Information Administration, 1999).

Black Non Hispanic: A race/origin category used by the Census Bureau that consists of persons who identified their race as "Black," but did not identify themselves as being of Hispanic origin or descent (National Telecommunications and Information Administration, 1999).

CD-ROM: Acronym for compact disc ready-only memory, an optical storage system for computers that allows vast amounts of data, text, and images to be stored and retrieved off a CD (Kohl, 1996).

College: A postsecondary-level institution that offers programs of study leading to an associate's, bachelor's, master's, doctoral, or professional degree. Colleges may be either two- or four-year institutions (Kohl, 1996).

Computer: A "computer" is defined as a personal or home workstation having a typewrite-like keyboard connected to a laptop computer, mini-computer, or mainframe computer (Kohl, 1996).

Digital Divide: The "digital divide" refers to the divide between those with access to new technologies and those without access (National Telecommunications and Information Administration, 1999).

Enrollment: Total number of students officially participating in a given program or institution at a particular time (Kohl, 1996).

E-mail: The digital transmission of a message from one person to another using a communications network (Kohl, 1996).

Higher Education: Study beyond the secondary level at institutions offering degree programs (Kohl, 1996).

Higher Education Institution: An institution legally authorized to offer programs at the two- or four-year level for credit and offering degrees. A university is a four-year institution offering degree programs beyond the baccalaureate level (Kohl, 1996).

Hispanic: Persons who are Hispanic are determined through self-identification. Persons of a Hispanic background are those who are Mexican-American, Chicano, Mexican, Mexicano, Puerto Rican, Cuban, Central or South American (National Telecommunications and Information Administration, 1999).

Internet: A worldwide system of interconnected networks allowing for data transmission among millions of computers. It is usually accessed using Internet Service Providers (Kohl, 1996).

Matriculate: The process begins when a new student submits an application to an admission office. If a student is designated to matriculate, he/she cannot register at the college until the necessary requirements are completed. The student files an application with the college and will receive a student identification number (I.D.#).

Modem: A device used to connect the computer to a telephone line, often for the purpose of connecting to online services. A modem can either be located internally in the PC, or can be an external device (Kohl, 1996).

Other Non Hispanic: A race/origin category used by the Census Bureau that includes Asians/Pacific Islanders, American Indians, Eskimos, and Aleuts, but not White non Hispanics or Black non Hispanics (National Telecommunications and Information Administration, 1999).

Rural: All areas not classified by the Census Bureau as urban and generally includes places of less than 2,500 persons (National Telecommunications and Information Administration, 1999).

Underrepresented Students: Oregon State University's admission office defines underrepresented students as those whose ethnic/racial background is African-American, Hispanic, Pacific Islander, and/or Native American.

University: A four-year institution of higher education offering degrees at the baccalaureate, master's, doctoral or first-professional levels (Kohl, 1996).

Urban: Includes those areas classified as being urbanized (having a population density of at least 1,000 persons per square mile and a total population of at least 50,000) as well as cities, villages, boroughs (except in Alaska and New York), towns (except in the six New England States, New York, and Wisconsin), and other designated census areas having 2,500 or more persons (National Telecommunications and Information Administration, 1999).

White Non Hispanic: A race/origin category used by the Census Bureau that consists of persons who self identified their race as "White," but did not identify themselves as being of Hispanic origin or descent (National Telecommunications and Information Administration, 1999).

World Wide Web: High speed, graphical interface for the Internet that permits real-time video, sound, and sophisticated graphics to be transmitted to the user. A broad and growing number of institutions are creating "home pages" on the Web as a source of public information and as a opportunity to market products and services to Internet users (Kohl, 1996).

CHAPTER 2

REVIEW OF THE LITERATURE

Considerable information relevant to this thesis draws from the report "Falling Through the Net: Defining the Digital Divide" (1999). It is the third in a series of reports from the National Telecommunications and Information Administration (NTIA) that describes those in the United States who have access to computers and the Internet. Overall, the NTIA found that the number of Americans connected to the nation's information infrastructure soaring. However, a closer look at the numbers show that not all groups in society are finding their way online in equal proportions. The technology gaps among those groups is widening at a quickening pace (National Telecommunications and Information Administration, 1999).

Completing paper-based college applications can be very difficult, especially if students apply to four or five different institutions (Folkers, 1997). For that reason, many higher education institutions are reporting that their application materials are now computer-generated and available for students to access from the Internet (Guernsey, 1998a, 1998b; Lach, 1999). Admission personnel suggest that online communication technologies will redefine fundamental aspects of the admission process. As the NTIA discover that there are technology gaps among certain groups of people, including college-bound students, will these students be able to access college information that may move exclusively online?

Besides focusing on technology and its benefits among higher education students in the United States, this research addresses the issues of online application materials and how first-year college students access such information. The Internet is an ocean of information for college students and has relevant applications for all areas of study (Anderson, 1995). Research suggests that students who utilize technology are more effective in academics (Anderson, 1995; Coley, Cradler, & Engel, 1997). Coley et al., (1997) found that students who are able to use technology have demonstrated "self-motivation, successful academic and career outcomes, and other positive outcomes such as increased problem-solving skills and collaboration."

The second section of this chapter will examine the digital divide in the United States. Society has undergone a fundamental transformation from the Industrial Age to the Information Age. Nevertheless, there is a great deal of research which shows that access to technology is not equal (Anderson, 1995; Chisholm, Carey, & Hernandez, 1998; Coley et al., 1997; Gladieux & Swail, 1999; Hoffman & Novak, 1998a, 1998b; Kiernan, 1998; Kohl, 1996; Molotsky, 1999; Murray, Hirt, & McBee, 1999; National Telecommunications and Information Administration, 1999; Oder, 1999; Raloff, 1998; Roach, 1999; Scott, 1995; StudentPol, 1996, 1998; Terrell, 1999; The Great Equalizer, 1999; Tucker, 1999; Wilson, 1995). With support of this research, the status of technology and access to this technology will be explored.

For years, one of the central goals of the United States' telecommunications policy has been bringing affordable telephone access to all Americans. With the blossoming of the Internet and the flow of information online, the concept of universal

service has been extended to include online access (Kennedy & Argon, 1999). This section explores a variety of ways to help increase the access of technology to college-bound students of color, varied income, and educational levels.

The last section of this chapter involves a discussion about the online admission process and how it could be affected by the technology gap. A study by the ART & Science Group Inc. (StudentPol, 1996, 1998), a Baltimore consulting firm that advises colleges on admission, states there is a group of prospective students who are not taking advantage or are not able to take advantage of these new communications technologies and lack computer expertise and sufficient hardware. The ART & Science Group Inc. claim these factors present major barriers to access.

Technology Can Enhance Learning

Technology is changing the way students are educated and the way learning occurs in- and out-of-the classroom (Smith, 1996). In order to facilitate learning, technology must be harnessed to support the processes students use when they learn (Morgan, 1996). Although technology reform began more than fifteen years ago, technology in the schools goes back twice as far. The computer-assisted instruction projects of the 1960s evolved with the increased availability of personal computers into the CD ROM-based multimedia learning resources of today (Coley et al., 1997). Telecommunications networks are blossoming and greatly extending the possibility of connections to learning sources across time and space, via e-mail and the electronic resources of the World Wide Web (Coley et al., 1997).

At the dawn of the 21st century, schools have embraced the potential learning

benefits that computers and related technology can bring to students (Coley et al.,

1997). Once thought of as luxuries or expensive toys, computers have become

common and vital part of a student's learning experience. The panel on Educational

Technology cites several potential learning benefits of technology including:

♦ Personalizing education to take advantage of the needs, interests, and learning styles of individual students.

♦ Giving more attention to higher-order thinking and problem-solving skills learned through "real-world" tasks.

♦ Letting students take greater control of their own education. They can seek resources when they become useful to them and explore topics in greater depth when they wish.

♦ Providing teachers with more efficient ways to assess student progress, maintain portfolios of student work, communicate with parents and administrators, exchange ideas and experiences with other teachers, and gain access to data and educational software over the Internet.

Other studies and surveys have indicated that technology can enhance student

achievement, increase self-motivation, and spark enthusiasm for learning (Kennedy &

Agron, 1999). A recent survey reports that more than 86 percent of principals claim

students developed an increased interest in classroom learning and activities with the

use of technology, and 83 percent claimed technology promoted creativity,

exploratory skills, and self-motivated learning (Kennedy & Agron, 1999).

Another report developed by the Educational Testing Service (ETS) found that

drill-and-practice forms of computer-assisted instruction are effective in producing

achievement gains in students (Coley et al., 1997). Many ongoing educational

technology projects are in the process of documenting and recording measures of student motivation, academic outcomes, and other results such as increased problem-solving skills and collaboration. ETS states that computer technology does not only involve the computer itself but involves an environment that can have important effects on learning (Coley et al., 1997).

Computers also provide students with experiences in technologies that can be used in many work situations (Coley et al., 1997). For example, students can incorporate word processing, databases, and desktop publishing software in their daily schoolwork. Computer technology is increasingly being used to provide students with opportunities to explore, enabling them to "construct" new knowledge and learn basic skills in useful contexts. Finally, Internet connections allowing electronic mail, file transfer, and conferencing offer a promise to educators seeking to prepare students for this century (Coley et al., 1997).

Morgan (1996) claims computers and other technologies can stimulate students to become actively involved in their learning by giving them the tools they need to manipulate their learning environment. Software programs engage students in an interactive dialog, simulations allow them to ask "what if" questions, interfacing technologies encourage students to design their own laboratory experiment, and portable meters allow students to gather data from their environment (Morgan, 1996). Multimedia workstations and telecommunications bring vast resources to the classroom for students to employ in the learning process. Technology also boosts

student productivity, allowing students to get more things done in the same amount of time (Morgan, 1996).

According to Gladieux & Swail (1999), today's university students are increasingly expected to learn with computers and the latest information technology. Students in language classes are developing friendships, exploring different cultures, and learning foreign languages through electronic "key pal relationships" with students from other countries (Wilson, 1995). Students interested in the field of science can work with actual research data found on the Internet instead of hypotheticals developed by the instructor or textbook author. Researchers have found these type of communications to open wide the doors of opportunity for real-life learning experiences—experiences few could have imagined just ten years ago (Wilson, 1995).

The number of college and university faculty who use technology to complement teaching has increased during the past two years (Kohl, 1996). An estimated 24 percent of higher education classes are held in computer-equipped classrooms. One-third of all courses now use electronic mail as the preferred mode of communication. Researchers claim the use of technology can greatly enhance student/faculty interaction in large classes where personal contact otherwise is often minimal. The use of e-mail chat rooms and discussion boards also makes possible extended classroom discussions about course texts and lecture materials that is not possible during class periods. In terms of instruction, the use of the World Wide Web has more than doubled over the last two years. It has been found that 40 percent of all

higher education institutions have a computer instruction or information technology

competency requirement for undergraduate students. Colleges and universities are

increasingly using technology in the learning process and expect their students to do

the same (Kohl, 1996). With the help of technology, students will gain knowledge and

readily translate and apply their knowledge to the real world (Murray et al., 1999).

Examining the Digital Divide

Does everyone have access to instant messaging? Does everyone know what

e-mail is? What about e-commerce? Equal opportunity has been a right in the United

States for more than two centuries. Nevertheless, society does not always measure up

to the idea of equality (Kennedy & Agron, 1999). Our educational system has

endured vicious battles over racial integration and the necessity to provide more

equitable educational opportunities to African-Americans and other minorities. In the

midst of struggling for equality, the rapidly accelerating power of technology and the

massive amounts of information available on the Internet have planted seeds of hope

among educators that computers can close the gap between those with technology

access and those without access to technology (Kennedy & Agron, 1999).

The Internet presents educators with an inequality in the form of barriers to

access (Scott, 1995). It is naïve to assume the benefits of electronic information will

eventually spread evenly to the entire population. To date, there are a number of

barriers preventing this equality (Anderson, 1995). First, there is an inequality

between Internet access and income levels. Internet access requires a personal

computer with online capabilities and an account. Anderson (1995) claims that educators have a responsibility to deal with this inequality. Second, there is an inequality in Internet use based on levels of education. Schools can reverse this trend, and prevent the Internet from becoming a learning tool limited largely to "bright" students, computer science majors, or advanced classes (Anderson, 1995).

The National Telecommunications and Information Administration's (NTIA) 1999 report, "Falling Through the Net: Defining the Digital Divide," provides an updated snapshot of the digital divide. The Census Bureau obtained data by interviewing 48,000 sample households. Results from the report showed access to computers and the Internet has soared for people in all demographic groups and geographic locations. At the end of 1998, over 40 percent of American households owned at least one computer, and one-quarter of all households had Internet access. Accompanying this good news, however, the NTIA (1999) found that there is persistence of the digital divide between the "information rich" (Whites, Asians/Pacific Islanders, those with higher incomes, and those more educated) and the "information poor" (such as those who are younger, those with lower incomes and education levels, certain minorities, and those in rural areas or central cities).

The NTIA's 1999 report reveals significant disparities, including the following:

- ◆ U.S. households are significantly more connected by telephone (94.1 percent) than by computer connection (42.1 percent), or Internet use (26.2 percent) (Appendix A).

♦ Among all Americans, 22.2 percent currently use the Internet at home and 17.0 percent use it outside of the home. Approximately two-thirds (67.3 percent) do not use the Internet at all (Appendix B).

♦ White households continue to own computers at a rate roughly twice that of Black and Hispanic households (Appendix C).

♦ Black and Hispanic families, regardless of income level, have less computer ownership than other ethnic groups (Appendix D).

♦ White Non Hispanic (29.7 percent) and Other Non Hispanic (34.8 percent) households own over twice the number of modems as Hispanic (12.2 percent) and Black Non Hispanic (11.9 percent) (Appendix E).

♦ There is a distinct difference between White (29.8 percentage points), Black (11.2 percentage points), and Hispanic households (12.6 percentage points) using the Internet (Appendix F).

♦ Regarding home access, the highest usage of the Internet at home is by urban Whites (29.4 percent), while the least usage is found among rural Blacks (6.3 percent) (Appendix G).

♦ When discussing Internet access outside the home, the two extremes are represented by Whites in central cities (21.8 percent) and rural Blacks (8.2 percent) (Appendix H).

♦ Black (7.7 percent) and Hispanic (7.8 percent) e-mail usage remains substantially behind Whites (21.5 percent) and Non Hispanics (20.9 percent) (Appendix I).

For many groups, the digital divide has widened as the information "haves" outpace the "have-nots" in gaining access to electronic resources. NTIA's 1999 report found the following gaps with regard to home Internet access:

♦ The gaps between White and Hispanic households, and between White and Black households, are now more than 6 percentage points larger than they were in 1994.

◆ The digital divide based on education and income levels have also increased in the last year alone. Between 1997 and 1998, the divide between those at the highest and lowest educational levels increased 25 percent.

Data reveal that the digital divide still exists and in many cases, has widened significantly. The gap for computers and Internet access had generally grown larger by categories of education, income, race, and geographic location (Hoffman & Novak, 1998a, 1998b; National Telecommunications and Information Administration, 1999; Oder, 1999; Roach, 1999).

Hoffman & Novak (1998b) also found that White students are significantly more likely than African-American high school students to have a personal computer (73.0 percent vs. 31.9 percent) (Appendix J). While Whites are currently more likely to have PC access, African-Americans are more likely to state they would like to acquire access. Nearly twice as many African-Americans as White high school students (58.9 percent vs. 31.1 percent) stated they planned to purchase a home computer in the next six months (Appendix J; Hoffman & Novak, 1998a, 1998b).

In terms of Internet access, Hoffman & Novak (1998b) claim White high school students are more likely to have used the Web (65.8 percent of Whites vs. 48.6 percent of African-Americans) and the gap between Whites and African-Americans becomes proportionally larger the more recently the respondent stated they had last used the Web. When Hoffman & Novak (1998b) consider respondents using the Web in the past week, 18.6 percent of Whites vs. only 11.6 percent of African-Americans used the Web. Whites and African-Americans also differ in terms of where they have used the Web. Most notably, Whites were significantly more likely (33.3 percent of

Whites vs. 13.0 percent of African-Americans) to have used the Web at home while African-Americans were likely to have used the Web at school (Hoffman & Novak, 1998a, 1998b).

The significant overall difference in home computer ownership that Hoffman & Novak (1998b) found between Whites and African-Americans appears to vary when examined in the context of different household income levels. Hoffman & Novak (1998b) found household income explains home computer ownership as increasing levels of income correspond to an increased likelihood of owning a home computer. There was also a varying pattern of race differences in access to a computer for different educational levels (Hoffman & Novak, 1998a, 1998b; Kiernan, 1998; Raloff, 1998). There was a slight tendency for Whites to have greater access to computers than African-Americans at the high school level. Thus, level of education explains access to a computer at home where increasing levels of education correspond to an increased likelihood of having access to a computer at home (Hoffman & Novak, 1998a, 1998b).

The most dramatic difference between Whites' and African-Amercians' home computer ownership was among current students, including both high school and college students (Hoffman & Novak, 1998b). Whereas 73 percent of White students owned a home computer, only 31.9 percent of African-American students owned one (Appendix J). This difference persisted when Hoffman & Novak (1998b) statistically adjusted for students' reported household income.

In 1999, research was conducted on who utilizes the Internet. They state that African-Americans and Hispanics do not have the backgrounds and experience considered by many to be necessary for the Internet. About 7.2 percent of engineering and computer science degrees were earned by African-Americans and 5.9 percent by Hispanics in 1996. Although they are the largest minority groups in the country, African-Americans and Hispanics have lagged in Net access and technology management for a long time (The Great Equalizer, 1999).

While computers and the electronic superhighway are transforming higher education, university and college campuses are experiencing a changing student population. Fewer than half of the nation's undergraduates are traditional 19 to 22 year olds, and minority student enrollment has increased to over 23% (Chisholm et al., 1998). These students bring with them a rich array of experiences and knowledge about the world. However, those experiences and knowledge may not have included information about computer technology. Many students from culturally, racially, and ethnically diverse backgrounds come to college with fewer experiences in technology and less computer expertise than their majority counterparts. These students may find themselves unable to meet faculty and institutional performance expectations and to take full advantage of their university education (Chisholm et al., 1998).

Bridging the Digital Divide

On June 5, 1998, President Clinton declared, "Until every child has a computer in the classroom and the skills to use it . . . until every student can tap the enormous resources of the Internet . . . until every high-tech company can find skilled workers to fill its high-wage jobs . . . America will miss the full promise of the Information Age" (Gladieux & Swail, 1999; pg. 21). Anderson (1995) asserts that Internet training is not a one-time instruction, but an evolving system that is rapidly growing and changing. It will require continuous learning to keep up with navigational tools, software utilities, and online resources. With the Internet, one must expect to constantly be a student (Anderson, 1995).

As schools become connected, administrators have a responsibility to provide adequate staff training (Anderson, 1995). Therefore, school staff members need to receive a great deal of training. Once educators are motivated to learn and keep up with the Internet, they can then begin to apply this knowledge to teaching (Anderson, 1995). The Internet can be a learning tool for every class across the curriculum, including high school and college. It is a broad-based information access tool equally serving learning in the humanities, social sciences, and sciences. Access must be open to all students in the classes and across the curriculum (Anderson, 1995).

Since the National Telecommunications and Information Administration's study (1999), the federal government has taken great strides to provide more funding for districts to wire their buildings (Kennedy & Agron, 1999). In the last few years, we have progressed toward the Clinton Administration's goal of having every family

home, classroom, and library connected to the Internet. The Northwest Educational

Technology Consortium (http://www.netc.org/) suggests several steps to help students

and families of limited means gain more access to computers and related technology.

Steps to help gain access to computers include:

- ◆ A lab night for students and parents to work together at computers.

- ◆ Have loaner equipment, such as computers, instructional videos, and calculators for families to borrow.

- ◆ Allow families to borrow software.

- ◆ Look into a telecommunications hookup between homes and the school.

- ◆ Keep labs open before and after school, in the evenings, and during the summer.

- ◆ Seek funds to serve groups with limited economic means.

- ◆ Partner with the public library to make equipment available to students during the summer.

- ◆ Offer programming classes as part of a latchkey program.

Daley (1999) states that for minorities, unemployment rates are still higher

than they are for the rest of the country. The surest way to help bridge the digital

divide in these areas is to encourage American companies to invest in America's inner

cities, which are good sources of customers and workers. During the Fall of 1999, a

national meeting was held in Washington on closing the digital divide where heads of

major technology companies, civil rights organizations, civic leaders, and community

groups attended (Daley, 1999). Public outreach must aid in bridging the digital divide.

Daley (1999) believes that two important programs President Clinton and Vice President Gore discussed can help close the digital divide. These programs include:

- ◆ Having a grant program to improve access to telecommunications and computer networks in under-served communities.

- ◆ The Education Department developing community technology centers across the country.

Even Microsoft Corporation is aiding to increase technology access. On January 13, 2000, Microsoft Corporation announced grants to eleven African-American and Hispanic universities across the country, the latest in the company's long-standing effort to increase technology access for students of color (Microsoft Grants Increase Technology Access, 2000). The grants, totaling $440,000 in cash and more than $1 million in software, will provide 150,000 students with benefits such as enhanced information technology curricula, distance learning opportunities, and improved access to the Internet. The Hispanic Association of Colleges and Universities (HACU) and the United Negro College Fund (UNCF), in coordination with Microsoft, selected the grant recipients (Microsoft Grants Increase Technology Access, 2000).

For more than six years, Microsoft Corp. has been committed to helping bridge the digital divide and has created and supported a number of efforts designed to provide equal access to technology across the nation (Microsoft Grants Increase Technology Access, 2000). In the past three years, Microsoft has given more than $173 million in cash and software to help thousands of organizations, including public libraries, colleges and universities, and community-based nonprofit agencies,

providing technology access to underserved communities. Through these efforts,

millions of underprivileged individuals across the nation, including children in Boys &

Girls Club, low-income students, and Native Americans are using technology and

have access to technology training (Microsoft Grants Increase Technology Access,

2000).

At another conference on "Bridging the Digital Divide" in Washington, D.C.

was held on December 9, 1999. President Clinton announced a series of plans to

finally close the digital divide. Some of these plans included:

- ♦ Leading a prominent delegation, including top CEOs, on a New Markets tour to focus specifically on the digital divide out in America. This team could visit communities that have not fully participated in our nation's economic growth.

- ♦ The President will sign an executive memorandum to ensure that closing the digital divide will be a vital goal throughout the federal government.

- ♦ With the help of many other groups, the Leadership Conference on Civil Rights is launching an initiative to empower the entire civil rights community through an expanding civil rights.org Web site, through leadership forums and even modern-day freedom riders who will bring high-tech training to the door-steps of non-profit organizations.

- ♦ The Benton Foundation is bringing together companies from across the computing, telecommunications, software, and Internet industries, as well as the Urban League and several other large private foundations, to crease the Digital Divide Network, an enormous clearinghouse for information on public and private efforts to bring technology to underserved communities.

At the end of the conference, President Clinton stated, "We must connect all of

our citizens to the Internet not just in schools and libraries, but in homes, small

businesses, and community centers. And we must help all Americans gain the skills they need to make the most of the connection" (Transcript of Clinton Remarks, 1999). By accomplishing some of these goals, the gap between those with technology access and those without can be bridged. Because technology is changing the way we educate students and the way learning occurs in the classroom, it will be a necessity for everyone to have access (Coley et al., 1997; Smith, 1996).

Applying to College Online

Technology is changing the way we educate students before they even reach the college classroom (Folkers, 1997). One of the most frequent uses of Internet sites is to offer prospective students information about admission to an institution (Folkers, 1997; Guernsey, 1998a; Koplowitz, 1998; Lach, 1999; Murray et al., 1999; StudentPol, 1998; Terrell, 1999). Admission is the first point of contact between students and the campus and, as such, one component of the access issue in higher education (Murray et al., 1999).

Completing the paper-based college application can be very tedious (Folkers, 1997). Form after form asking for personal information, educational background, and the need to develop one essay after another can make the college application process very monotonous. To make a good first impression on a school, however, neatness and legibility count. Given the flexibility the PC offers for editing and re-using the same data in different applications, it is not surprising that the college application process has gone online (Folkers, 1997).

College-bound students are exploring colleges' World Wide Web sites, investigating applications, catalogues, and live chat opportunities (Guernsey, 1998b; StudentPol, 1998; Terrell, 1999). The ART & Science Group Inc. (StudentPol, 1998), a higher-education-marketing company, has recently published research from interviews with 500 high-school seniors across the country that planned on enrolling in a four-year college during Fall of 1998 and who achieved a combined SAT score of 1050 or higher. Overall, the study found that students' use of the Internet and colleges' Web sites continues to rise. About 78 percent of students surveyed reported using individual college Web sites on the Internet, compared to 58 percent in 1997, and only 4 percent in 1996. Of those who used the Web, four-fifths claimed they had examined colleges' Web sites to find admission information, course catalogues, and descriptions of programs. Almost as many prospective college students reported they had used the sites to learn what majors were offered and to get a general impression for the colleges. StudentPol has found that about 34 percent of prospective college students rank Web sites as "very important" in the college decision-making process (Appendix K).

StudentPol (1998) also claims their findings show that students are not only using the Web more frequently as an information source, they are also using the Web to access in-depth, substantive information about colleges and universities. The Web is simplifying information gathering for both students and admission personnel, appearing to offer students an effective tool to compare different institutions. Data from StudentPol has also revealed that a very high proportion of students are using the

Web to apply online, explore online catalogs, analyze college information on specific

programs and majors, and to get a general impression for the school even before

stepping foot on the university campus.

Today, Lach (1999) claims that prospective students can access the Web and

apply to many colleges online via university home pages as well as third-party sites.

Some institutions even encourage electronic applications by waiving the application

fee for students who file online, and the response has been dramatic (McCollum,

1999). For example, in 1997, the first year the University of Dayton offered online

applications, only 2 percent of applicants completed their applications online. In

1999, with the fee waived, that figure soared to 49 percent. As a result of this data,

University of Dayton has concluded that by waiving the application fee, more students

will apply online and may eventually matriculate (Lach, 1999).

MIT's School of Management took a radical step in 1999 by requiring all

prospective students to file applications online (Lach, 1999). MIT officials claimed

they were "simply taking advantage of the technology" (pg. 13). Unlike MIT, most

colleges are still trying to figure out how to integrate electronic applications into the

admission process. One dilemma facing administrators is whether to offer their

applications on third-party resource sites in addition to their own home pages (Lach,

1999). These third-party sites attract prospective students because they provide

application and information about many colleges. Lach states that College Edge, for

example, declared it processed 500,000 electronic applications in 1999. However, in

addition to a per-application processing fee, College Edge charges colleges anywhere

from $10,000 to $40,000 for its services, which includes access to recruitment database, e-mail management, and event scheduling. For the time being, most admission officials are doing both, teaming up with third parties and developing their own Web presence for prospective college students (Lach, 1999).

As colleges and universities are marketing their online application materials now more than ever, Murray et al. (1999) found that students who apply for admission electronically are more likely to be Caucasian. Non-electronic applicants, on the other hand, are more likely to be applicants of different racial backgrounds. These findings pose interesting questions when discussing equal access to technology among all ethnic groups of students. Recently, data from the Higher Education Research Institute (1998) indicated that students should not leave home without forgetting to pack their laptop (Appendix L). As researchers discover certain ethnic groups do not have access to technology and are not applying to college online, these same students without access are expected to also come to college with a computer, knowledge of how to operate it, and experience just like their majority counterparts (Lach, 1999).

CHAPTER 3

METHODOLOGY

Data regarding the online application process has never been gathered at

Oregon State University. As of January 2001, the OSU Admission Office did not

keep track of who applies online (demographics) and how many online applications

are submitted each academic year. This study provides OSU with the demographics

of who applies online and estimates how many students apply via the Internet. This

two-part study not only discusses demographics data but also addresses students'

points of view as to why they chose to apply online or via the paper-based application

during the 1999 – 2000 academic year. The results of this research were presented to

the Oregon State University admission office on February 2, 2001, as the admission

office was interested in learning the response of students to both online and paper-

based application processes.

Sample

The individuals selected to participate in this study were newly accepted first-

year Oregon State University students enrolled during the Fall 2000 quarter. For the

purpose of this research, first-year students are defined as students entering college for

the first time, regardless of age. After consultations with Dr. Warren Suzuki from

Oregon State University's School of Education (personal communication, Spring

2000), 528 OSU students (19.17 %) out of a total of 2,754 first-year students (transfer

student excluded) were randomly selected for analysis on demographics (age, gender, ethnicity, and application type). These 528 who enrolled during the 1999 – 2000 were selected using a systematic sampling method, a procedure by which the total population (2,754 first-year OSU students) was placed on a list. Every person whose social security number ended in a 5 or 6 was selected for a total of 528 participants (19.17% of the total first-time, first-year students). Table 3.1 illustrates the number of applicants that were used in the first part of this study. Note the distribution between online vs. paper applicants (18.6% vs. 81.4%).

Table 3.1   A random sample of 528 OSU students were selected from the 1999 – 2000 recruitment class to conduct analysis.

Application Type	Number of Applicants	Percentage
Paper Application	430	81.4 %
Online Application	98	18.6 %
Total	528	100.0 %

In the first part of this study, the OSU Admission Office database pulled 528 student files based on the above-mentioned criteria in order to determine the students' names, identification numbers, ages, gender, and ethnicity. It was then necessary to determine whether applications were submitted online or via the paper-based option. This demographic data provided insight as to who participated in the online vs. paper-based application process and also gave the OSU Admission Office an estimate as to how many online applications were submitted during the 1999 – 2000 academic year.

For the second part of the study, 48 students who were 18 years of age or older were selected from the 528 sample in Part I using a stratified random sample method to participate in a one-on-one telephone interview. Since the ethnicity of the students was known from Part I of this study, 24 students (12 White/Caucasian & 12 underrepresented students—3 Pacific Islander, 3 Hispanic, 3 African-American, and 3 Native-American students) who applied online and 24 students (12-White/Caucasian & 12-underrepresented students—3 Pacific Islander, 3 Hispanic, 3 African-American, and 3 Native-American students) who applied via the paper application were selected for the telephone interview (Table 3.2). This study sought to include all 4 groups of underrepresented students at Oregon State University with a different perspective within each group. As a result, it was decided that 3 students from each underrepresented group would participate in the telephone interviews.

Table 3.2   Total Number of Students Participating in Telephone Interview

	Number of Students by Race/Ethnicity		
Groupings	White	Underrepresented Students	Total
Paper Applicants	12	12	24
Online Applicants	12	02	14
Underrepresented/Oversample	0	10	10
			48

The 12 Caucasian students who applied via the paper application were randomly selected using a systematic sampling method. Every participant whose social security number ended in a 2, 6, 7, and 8, were called until 12 participants were successfully reached and completed the telephone interview. The 12 Caucasian students who applied to OSU using the online application were also randomly selected

using the same systematic sampling method. Every participant whose social security number ended in the number 5 was called until 12 participants completed the telephone interview.

Finally, the 12 underrepresented students who applied to OSU using the paper application were randomly selected using the same method. As described in the previous page, this study sought to include all 4 groups of underrepresented students at Oregon State University with a different perspective within each group. As a result, 3 Hispanic students, 3 African American students, 3 Pacific Islander students, and 3 Native American students were selected to participate in this study. Participants in each ethnic group whose social security number ended in the numbers 1 or 8 were called until 12 participants completed the telephone interview.

The remaining 12 underrepresented students who applied to OSU using the online application were chosen as an oversample using the same random sampling technique described above. Since only a small percentage of the original 528 students were members of an underrepresented group at OSU and applied via the online application, it was necessary to request additional names of underrepresented students who applied to OSU during the 1999 – 2000 academic year. As a result, an additional 130 student files were analyzed to determine underrepresented students who applied to OSU online. Again, to make sure the sample was representative of the underrepresented group present at OSU, 3 Hispanic, 3 African American, 3 Pacific Islander, and 3 Native American participants were selected. Participants in each

ethnic group whose social security number ended in the numbers 1, 2, 4, 6 or 8 were called until 12 participants completed the telephone interview (Table 3.2).

One week after completion of the telephone interviews, the final part of the research began. Face-to-face group interviews were scheduled with the 48 participants from Part II for further inquiry. Four separate group interviews (group #1—12 students of color who applied online, group #2—12 White/Caucasian who applied online, group #3—12 students of color who applied via the paper application, and group #4—12 White/Caucasian who applied via the paper application) were scheduled to provide the OSU Admission Office with information as to how to better improve the OSU application process.

Collection of Data

On July 4, 2000, a formal request for a human subject study was submitted to the Institutional Review Board (IRB) at Oregon State University. Notification was received from the IRB on July 18, 2000 which approved the study described above. As a result, the questions used in the telephone interview and group interview were all approved prior to the beginning of this research project.

During the month of October 2000, data for the first part of the study was gathered from a random list provided by the OSU Admission Office of 528 first-year matriculated OSU students. After the list was generated on October 9, 2000, student files were examined to determine each individual's application type (online vs. paper-based application).

On October 15, 2000, the second part of the study began. The 48 participants were chosen randomly from the list of 528 students from the first part of this study to participate in a one-on-one telephone interview. All participants were guaranteed confidentiality, and it was assured that their participation was voluntary. Interview questions (Appendix M—online applicant; Appendix N—paper-based applicant) focused on why the participants chose to apply by the method they did, and asked for a general discussion about how to improve the application process at OSU. Questions also focused on how to improve the online application, and asked for detailed information on the student not provided in their files (computer ownership, computer expertise, demographics, parent(s) occupation, and family income). Students had the right to refuse any or all questions, including questions regarding demographic and family income. One day after each telephone interview took place, participants were sent a postcard (Appendix O) thanking them for their participation.

On November 10, 2000, face-to-face group interviews were scheduled with students for further inquiry. Participants were informed by telephone a week prior to the group interview regarding the date, time, and location the interviews would take place. Participants were also sent a reminder through the mail two days prior to the group interview (Appendix P). Students were informed that following the group interview, a drawing for a $20.00 gift certificate from the OSU Bookstore would take place. The gift certificate was used as an incentive for students who spent time to participate in the face-to-face group interviews.

Four separate group interviews (group #1—students of color who applied
online, group #2—White/Caucasian who applied online, group #3—students of color
who applied via the paper application, and group #4—White/Caucasian who applied
via the paper application) were scheduled in the Willamette East Room on the third
floor of the OSU library to provide additional data for answering the research
question. Group interview questions were developed for online applicants (Appendix
Q) and for students who applied via the paper application (Appendix R). In addition, a
consent form was developed (Appendix S) for participants to complete before the
group interview. Even though students were reminded verbally and in writing about
the group interview and were offered the chance to receive a $20.00 gift certificate
from the OSU Bookstore, no students chose to participate in the group interviews.

CHAPTER 4

RESULTS

Chapter 4 discusses the results and statistical analysis of demographic data

collected on a sample of first-year Oregon State students who applied to the University

via the online and paper-based application processes. In the following chapter, data

are presented first on the number of students who applied via each application process,

followed by application types broken down by the student's gender, ethic background,

and age. Finally, information gathered from individual telephone interviews is

presented. The findings of the one-on-one telephone interviews were analyzed using

themes, as suggested in Ely's (1991) book.

Presentation of Results

The Research Questions: As technology in the area of college admission

moves forward and more application processes occur online, are certain

ethnic and racial groups of first-year Oregon State University students being

left without access to these online materials? What are the demographics of

the 1999 – 2000 Oregon State University class in terms of online

applications vs. paper applications, ethnicity, gender and age distribution?

Application and Gender Demographics

There were significantly more students who applied to Oregon State University during the 1999 – 2000 academic year using the paper application than by using the online application (Table 4.1).

Table 4.1   A random sample of 528 OSU students were selected from the 1999 – 2000 recruitment class to conduct analysis.

Application Type	Number of Applicants	Percentage
Paper Application	430	81.4 %
Online Application	98	18.6 %
Total	528	100.0 %

During the 1999 – 2000 academic year, Oregon State University recruited a total of 2,754 full-time first-year students (transfer students excluded from this study). A random sample of 528 students (20% of the total first-year students) was selected to conduct statistical research. After analyzing all 528 student files, it was found that 430 students (81.4%) applied to OSU using the paper application while 98 students (18.6%) applied via the online application.

The total number of paper and online applications analyzed in this study totaled 528. Of this number, 284 students (53.8%) were male and 244 students (46.2%) were female. Of the 430 students who applied to Oregon State University using the paper application, 215 students (50.0%) were male and 215 students (50.0%) were female. Of the 98 students who applied to Oregon State University using the online application, 69 students (70.4%) were male and 29 students (29.6%) were female (Table 4.2).

Table 4.2   Percentages of first-year male and female applicants who applied to OSU via the online and paper application forms during Fall 2000.

Application Type	Gender	Number of Applicants	Percentage of Whole
Paper & Online Applications	Males	284	53.8 %
Paper & Online Applications	Females	244	46.2 %
Total Paper & Online Applicants		528	100.0 %
Paper Applicants	Males	215	50.0 %
Paper Applicants	Females	215	50.0 %
Total Paper Applicants		430	100.0 %
Online Applicants	Males	69	70.4 %
Online Applicants	Females	29	29.6 %
Total Online Applicants		98	100.0 %

Demographic Information on Ethnic Origins

Tables 4.3, 4.4, and 4.5 depict the ethnic distribution of the sampled first-year students who applied to Oregon State University during the 1999 – 2000 academic year. Specifically, Table 4.3 shows the ethnic distribution of the total 528 random first-year students who applied to Oregon State University. Of the 528 first-year students randomly selected who applied to Oregon State University during the 1999 – 2000 academic year, 430 applied using the paper application. Table 4.4 displays the ethnic distribution of these 430 students. On the other hand, of the 528 random first-year students who applied to Oregon State University during the 1999 – 2000 academic year, 98 students applied using the online application. Table 4.5 shows the ethnic distribution of these 98 students. In all three tables, over 76% of applicants were of White/Caucasian background, where as only about 4% were Hispanic in origin and about 1% were of African-American/Black descent.

Table 4.3 Ethnic distribution of the 528 first-year applicants selected for this study.

Ethnicity	Number of Online & Paper Applications	Percentage
White	406	76.89 %
Asian-American	44	8.33 %
Hispanic	23	4.36 %
Decline to Respond	17	3.22 %
Other	16	3.03%
Native American/Alaskan Native	8	1.52 %
Pacific Islander	7	1.33 %
Black	5	0.95 %
Middle Eastern	2	0.38 %
Total	528	100.0%

Table 4.4 Ethnic distribution of the 430 first-year students who applied to OSU via the paper application in Fall 2000.

Ethnicity	Number of Paper Applications	Percentage
White	330	76.74 %
Asian-American	38	8.84 %
Hispanic	19	4.42 %
Other	15	3.49 %
Decline to Respond	9	2.09 %
Native American/Alaskan Native	7	1.63 %
Pacific Islander	7	1.63 %
Black	4	0.93 %
Middle Eastern	1	0.23 %
Total	430	100.0 %

Table 4.5   Ethnic backgrounds of the 98 first-year OSU students selected for this study who applied via the online application process.

Ethnicity	Number of Online Applications	Percentage
White	76	77.55 %
Decline to Respond	8	8.17 %
Asian-American	6	6.12 %
Hispanic	4	4.08 %
Other	1	1.02 %
Native American/Alaskan Native	1	1.02 %
Black	1	1.02 %
Middle Eastern	1	1.02 %
Pacific Islander	0	0.0 %
Total	98	100.0 %

Table 4.6 illustrates the ethnic and age distribution of the total 528 random first- year students who applied to Oregon State University during the 1999 – 2000 academic year. Of the 528 random first-year students who applied to Oregon State University during the 1999 – 2000 academic year, 430 applied via the paper application. Table 4.7 shows the ethnic and gender distribution of theses 430 students. Nevertheless, of the 528 random first-year students who applied to Oregon State University during the 1999 – 2000 academic year, 98 students applied using the online application. Table 4.8 displays the ethnic and gender distribution of these 98 students. Results showed that the gender distribution of students who applied to OSU using the paper application was about equal except for the African-American group (47% male vs. 53% female—White students; 58% male vs. 42% female—Asian-American students; 53% male vs. 47% female—Hispanic students; 75% male vs. 25% female—

African-American students; Table 4.7). When looking at students to applied to OSU online, the gender distribution changes significantly (67% male vs. 33% female—White students; 83% male vs. 17% female—Asian-American students; 75% male vs. 25% female—Hispanic students; 100% male vs. 0% female—African-American students; Table 4.7). It was found that regardless of ethnicity, a significantly higher percentage of males rather than females apply to Oregon State University using the online application.

Table 4.6   Percentages of males and females, broken down by ethnic background of the sampled 528 OSU students who applied to OSU in Fall 2000.

Ethnicity of Online & Paper Applications	Male Students	Percent Male	Female Students	Percent Female
White	207	50.99 %	199	49.01 %
Asian-American	27	61.36 %	17	38.64 %
Hispanic	13	56.52 %	10	43.48 %
Decline to Respond	14	82.35 %	3	17.65 %
Other	11	68.75 %	5	31.25 %
Native American/Alaskan Native	4	50.0 %	4	50.0 %
Pacific Islander	3	42.86 %	4	57.14 %
Black	4	80.0 %	1	20.0 %
Middle Eastern	1	50.0 %	1	50.0 %
Total	284		244	

Table 4.7   Ethnic and gender distribution of the 430 first-year OSU students
selected who applied via the paper application in Fall 2000.

Ethnicity for Paper Applications	Male Students	Percent Male	Female Students	Percent Female
White	156	47.27 %	174	52.73 %
Asian-American	22	57.89 %	16	42.11 %
Hispanic	10	52.63 %	9	47.37 %
Other	10	66.67 %	5	33.33 %
Decline to Respond	8	88.89 %	1	11.11 %
Native American/Alaskan Native	3	42.86 %	4	57.14 %
Pacific Islander	3	42.86 %	4	57.14 %
Black	3	75.0 %	1	25.0 %
Middle Eastern	0	0.0 %	1	100.0 %
Total	215		215	

Table 4.8   Ethnic and gender distribution of the 98 first-year OSU students
selected who applied via the paper application in Fall 2000.

Ethnicity for Online Applications	Male Students	Percent Male	Female Students	Percent Female
White	51	67.11 %	25	32.89 %
Decline to Respond	6	75.0 %	2	25.0 %
Asian-American	5	83.33 %	1	16.67 %
Hispanic	3	75.0 %	1	25.0 %
Other	1	100.0 %	0	0.0 %
Native American/Alaskan Native	1	100.0 %	0	0.0 %
Black	1	100.0 %	0	0.0 %
Middle Eastern	1	100.0 %	0	0.0 %
Pacific Islander	0	0.0 %	0	0.0 %
Total	69		29	

Age Demographics

Table 4.9 illustrates the age distribution of the total 528 randomly selected

first-year students who applied to Oregon State University during the 1999 – 2000

academic year. Table 4.10 shows the age distribution of the 430 students and Table

4.11 illustrates the age distribution of the 98 students who applied via the online

application process. It was found that 18 and 19 year-old students predominantly

applied to Oregon State University during the 1999 – 2000 academic year, making up

94.4% of the 528 sampled. Note that the oldest student who applied to OSU online

was 27 years of age whereas 4 students over the age of 30 applied via the paper-based

application, the oldest of whom was age 43 (Table 4.10).

Table 4.9   Age distribution of the 528 first-year OSU students selected for this
             study who applied either via the paper or online processes.

Age	Number of Paper & Online Applications	Percentage
17	4	0.76 %
18	305	57.8 %
19	193	36.6 %
20	16	3.0 %
21	2	0.38 %
22	2	0.38 %
24	1	0.19 %
27	1	0.19 %
31	1	0.19 %
37	1	0.19 %
41	1	0.19 %
43	1	0.19 %
Total	528	100.0 %

Table 4.10   Age distribution of the 430 selected first-year OSU student who applied
via the paper application process during the 1999 – 2000 academic year.

Age	Number of Paper Applications	Percentage
17	4	0.93 %
18	256	59.53 %
19	149	34.65 %
20	14	3.27 %
21	2	0.47 %
24	1	0.23 %
31	1	0.23 %
37	1	0.23 %
41	1	0.23 %
43	1	0.23 %
Total	430	100.0 %

Table 4.11   Age distribution of the 98 selected first-year OSU student who applied
via the paper application process during the 1999 – 2000 academic year.

Age	Number of Online Applications	Percentage
18	49	50.0 %
19	44	44.90 %
20	1	1.02 %
21	1	1.02 %
22	2	2.04 %
27	1	1.02 %
Total	98	100.0 %

Related Questions: There is a great deal of statistical information concerning computer access in the United States and around the world, but what is the student's point of view about computer access or applying to college online? What do first-year Oregon State University students of different racial and ethnic backgrounds think about accessing online application information? What are the effects, if any, of first-year Oregon State University students who may be left without access to online admission application materials?

As stated earlier, data collected from the one-on-one telephone interviews were analyzed using themes. Ely states that a widely used approach to final analysis is the search for themes (Ely, 1991). Thematic analysis was used to present the findings of the one-on-one telephone interviews conducted in this study. Below are four groups of students from which themes have been developed based upon interview results (1. underrepresented students who applied to OSU using the paper application, 2. underrepresented students who applied to OSU using the online application, 3. Caucasian students who applied to OSU using the paper application, and 4. Caucasian students who applied to OSU using the online application).

Below is a list of selected statements taken from the 48 OSU students who participated in the telephone interviews. Students gave permission to make their statements public if names were in no way connected to individual statements. The following samples successfully represent the themes developed throughout the telephone interviews.

Themes—Underrepresented Students who Applied to OSU using the Paper Application

I. Credit Card Requirement

In order to apply to Oregon State University online, a credit card is needed. My family does not have a credit card so I was unable to apply to OSU online.

My family was worried about giving our credit card number over the Internet so they prevented me from applying online.

OSU can improve the online application process by eliminating the requirement of the credit card for use of payment.

The online application process at OSU is easy to access if you have a computer with Internet access and if you have a credit card.

II. OSU Representative Assisting

My high school had an OSU Admission Representative visit and I got an application from them. The representative helped me complete the paper application.

III. Computer Access

I do not have access to a computer and the Internet at home or at school.

IV. Computer Knowledge

I didn't apply to OSU online because at the time I did not know how to use the Internet.

V. Website Difficulties

My friends told me it took a long time to bring the OSU webpage up on the computer so I decided to avoid the hassle and just apply using the paper application.

VI. Application Fee

I didn't apply to OSU online because OSU wouldn't waive the application fee.

Themes—Caucasian Students who Applied to OSU using the Paper Application

I. Computer Access

Access to the online application at OSU is easy. I applied via the paper application because an OSU Representative was communicating with me and only encouraged me to apply using the paper application.

II. Honor's College

I couldn't apply to OSU online because there is a separate application that needs to be completed it if you are applying to the Honor's College. The Honor's College application is not available online.

III. Computer Knowledge

I didn't apply to OSU online because I have never used the Internet while at home. It would have taken more time to learn how to use the online application that it would have to apply to OSU using the paper application.

I wasn't involved with technology before I came to OSU but since my arrival, I utilize the Internet on a daily basis.

IV. Security Issues

I didn't apply to OSU online because I didn't want to worry about security issues. The online application was unknown and unpaved territory for me.

V. Printable Application

I printed my application from the Internet and mailed it in to OSU. My computer was being used by others in my family to I couldn't apply online.

VI. OSU Representative Assisting

I went to a college fair in Portland and got a paper application from an OSU Representative who I later corresponded with.

VII. Reputation of Online Applications

The online application process is easy to access but I feel it may not be taken as seriously by universities.

Themes—Underrepresented Students who Applied to OSU using the Online Application

I. Quick Processing

At the time that I was applying to OSU, I was in Germany on an exchange program. Applying to OSU online helped speed up the process, especially since I was living overseas.

I applied to OSU online because it was a fast, easy, and convenient way to apply to college.

I needed to send my application to OSU quickly because I applied in April of 2000. As a result, I decided to apply to OSU using the online application. It was easy and convenient, especially if you do not live in Oregon.

I was encouraged by my high school guidance counselor to apply to OSU online. My high school counselors told me that I would receive a faster response from the University. OSU replied back a week after I sent my online application.

II. Access to a Home Computer

I don't think I would have applied to OSU online if I did not have a home computer. Applying to college is a very private personal experience. Using a computer lab at school is not as private as one's home.

III. Saving Money

My parents encouraged me to apply to OSU online because we would save money on postage. It is my opinion that the OSU online application is easy to access if you have a home computer with Internet access and if you know how to use technology. Many of my friends decided to apply to college using the paper application because their families did not have a home computer.

IV. Appearance

I thought that by applying to OSU online, it would look professional since everything in the twenty-first century is being done on the computer.

V. Lost Materials

The OSU online application was easy to access except that my application got lost. I was told that the electronic transmission must have not gone through. I had to make several calls to the University to straighten the whole situation out.

Themes—Caucasian Students who Applied to OSU using the Online Application

I. Quick Processing

I applied to OSU online because I was living in another country. At the time, the online application was a quick and convenient process.

I am always on the Internet and was never worried about security issues. As a result, I applied to OSU online because it was quick and convenient.

The online application is a 'last-minute' application process. It allowed me to cut-through some of the red tape. The online application process is a great tool for procrastinators like myself.

Applying to OSU online was a quick and easy way to get to college. I was encouraged by my family to apply to as many schools as I can online.

II. Saving Money

My family encouraged me to apply to OSU online because we would save costs on postage. My family also suggested that if I applied online, my application would get to OSU faster.

III. Home Computer

Our Internet connection at home was very fast. I sent the application at the click of a button. My high school guidance counselor suggested that I apply online because it looks professional and is a quick way to apply to college.

IV. Technical Difficulties

While I was applying online, the OSU webpage froze several times. It was frustrating but I finally sent my application and put in all of the information needed to submit my application online.

The online application process at OSU is a little inconvenient if you cannot complete the application in one sitting. A system needs to be developed where you can save part of your work and come back to the application the next day.

Additional Results

In addition to providing pertinent information regarding the online and paper application process, the 48 students who participated in the telephone interview were asked to disclose some personal demographic information (Tables 4.12 & 4.13).

Table 4.12 Demographic and personal information of the 24 first-year OSU students who applied via the online application & who participated in the phone interview.

Questions for Applicants who Applied to OSU Online	Caucasian Students	Percent	Underrepresented Students	Percent
What is your age?	18 years of age: 11 19 years of age: 1	91.7 % 8.3 %	18 years of age: 5 19 years of age: 2 21 years of age: 1 26 years of age: 1	55.6 % 22.2 % 11.1 % 11.1 %
What is your gender?	Female: 6 Male: 6	50.0 % 50.0 %	Female: 5 Male: 7	41.7 % 58.3 %
At Oregon State University, what is your student status?	Full-Time—12	100 %	Full-Time—12	100 %
My ethnic background is:	White—12	100 %	Pacific Islander—3 Hispanic—3 African American—3 Native-American—3	25.0 % 25.0 % 25.0 % 25.0 %
How would you classify your home city?	Rural—6 Urban—5 Central City—1	50.0 % 41.7 % 8.3 %	Rural—6 Urban –2 Central City—4	50.0 % 16.7 % 33.3 %
How would you classify your family's income?	15 - $34,999: 5 35 - 74,999: 2 > $75,000: 4 Decline: 1	41.7 % 16.7 % 33.3 % 8.3 %	15 - $34,999: 0 35 - 74,999: 6 > $75,000: 3 Decline: 3	0 % 50.0 % 25.0 % 25.0 %
How many people are in you family excluding yourself?	1-parent: 2 2-parents: 10	16.7 % 83.3 %	1-parent: 1 2-parents: 11	8.3 % 91.7 %
	No siblings: 2 1-sibling: 5 2-4 siblings: 5	16.7 % 41.7 % 41.7 %	No siblings: 1 1-sibling: 4 2-4 siblings: 6 > 4 siblings: 1	8.3 % 33.3 % 50.0 % 8.3 %
Are you the first member of your family to attend college?	No—7 Yes—5	58.3 % 41.7 %	No—9 Yes—3	75.0 % 25.0 %

Table 4.13   Demographic and personal information of the 24 first-year OSU students who applied via the paper application & who participated in the phone interview.

Questions for Applicants who Applied to OSU Using the Paper Application	Caucasian Students	Percent	Underrepresented Students	Percent
When did you last use the Internet?	Past Week—12	100 %	Past Week—12	100 %
When applying to colleges last year, did you family own a computer or have Internet access?	Yes—12 No—0	100 %	Yes—9 No—3	75 % 25 %
Will you have a computer in your room while attending OSU?	Yes—11 No—1	91.7 % 8.3 %	Yes—7 No—5	58.3 % 41.7 %
What is your age?	18 years of age: 12	100 %	18 years of age: 11 19 years of age: 1	91.7 % 8.3 %
What is your gender?	Female—7 Male—5	58.3 % 41.7 %	Female—4 Male—8	33.3 % 66.7 %
At Oregon State University, what is your student status?	Full-Time—12	100 %	Full-Time—12	100 %
My ethnic background is:	White—12	100 %	Pacific Islander: 3 Hispanic: 3 African American: 3 Native-American: 3	25.0 % 25.0 % 25.0 % 25.0 %
How would you classify your home city?	Rural—8 Urban—3 Central City—1	66.7 % 25.0 % 8.3 %	Rural—5 Urban—7	41.7 % 58.3 %
How would you classify your family's income?	15 - $34,999: 1 35 - 74,999: 3 > $75,000: 7 Decline: 1	8.3 % 25.0 % 58.3 % 8.3 %	15 - $34,999: 4 35 - 74,999: 5 > $75,000: 1 Decline: 2	33.3 % 41.7 % 8.3 % 16.7 %
How many people are in you family excluding yourself?	2-parents: 12	100 %	1-parent: 6 2-parents: 6	50.0 % 50.0 %
	1-sibling: 2 2-4 siblings: 9 > 4 siblings: 1	16.7 % 75.0 % 8.3 %	1-sibling: 3 2-4 siblings: 8 no siblings: 1	25.0 % 66.7 % 8.3 %
First to attend college in your family?	No—9 Yes—3	75.0 % 25.0 %	No—8 Yes—4	66.7 % 33.3 %

CHAPTER 5

DISCUSSION

The major objectives of this study were to ascertain if certain ethnic and racial

groups of first-year Oregon State University students are being left without access to

online admission materials, and to determine what the students' point of view is about

computer access or applying to Oregon State University online. In addition, the

demographics of the 1999 – 2000 Oregon State University class (online vs. paper

applications, ethnicity, gender and age distribution) was analyzed.

This chapter highlights the major findings of this study and explores

implications for campuses committed to helping students gain access to technology

and utilizing an institution's online admission information. Any discussion of these

findings should be grounded in the context of this study. The institution at which this

study was conducted is a major research institution comprised of 16,093 students

where technology is extensively used, with one of the institution's flagship

departments being the College of Engineering (Oregon State University 2000 Fact

Book). The gender composition of the student body is about equal (53% male vs.

47% female). It is important to emphasize that the online admission process is only

one application of technology in higher education and that there are many factors that

influence where, and how, students apply to college. Nevertheless, this study poses

some implications for practitioners and raises even more questions regarding

technology access and the paper versus electronic application processes.

In this study, the students who applied for admission online were more likely to be male, Caucasian, and traditional students (18 & 19 years-of-age). Non-electronic applicants, on the other hand, were more likely to be female, underrepresented, and other than average students who were applying for early admission. These finding pose some interesting dilemmas for administrators working within the field of admission and recruitment.

Part I—Results of Demographic Research

During the 1999 – 2000 academic year, of the 528 students selected, only 18.6% applied to Oregon State University online while 81.4% applied using the paper application process. It is of interest to note that of this 18.6% that applied online, 70% were male and only 30% were female. The gender issue of students who apply online is especially perplexing since the male/female distribution of students who applied via the paper application was exactly equal (50% male vs. 50% female).

Results also showed that the gender distribution of students who applied to OSU using the paper application was about equal except for the African-American group (47% male vs. 53% female—White/Caucasian students; 58% male vs. 42% female—Asian-American students; 53% male vs. 47% female—Hispanic students; 75% male vs. 25% female—African-American students). The 75% male vs. 25% female ratio is of interest, nevertheless, the sample size was extremely small (4 students). When looking at students who applied to OSU online, the gender distribution significantly changes. It was found that regardless of ethnicity, a

significantly higher percentage of males rather than females apply to Oregon State University using the online application.

When discussing technology access, gender inequality is well documented. The results of the present study are consistent with prior research, which suggests that women do not use technology to the same extent as men (Murray, Hirt, & McBee, 1999; National Telecommunications and Information Administration, 1999; StudentPol, 1996). At most institutions, women comprise the majority of students. The increased use of the online application over time could lead to a decrease in the number of female applicants. The implications of such a decrease on the overall number of students enrolled in colleges and universities should be considered when campuses weigh the advantages and disadvantages of the online application.

Other possible explanations for this inequality might lie in students' attitudes towards technology. Studies have shown that males view computers as more appropriate to their sex and feel more competent in their computing abilities than do females (Murray, Hirt, & McBee, 1999; National Telecommunications and Information Administration, 1999). Additionally, males believe that computers are part of a male-oriented domain, thus perpetuating sex-role stereotypes associated with the use of technology (Murray, Hirt, & McBee, 1999). Some differences might also be attributed to training. Significantly more men than women enroll in college computer and engineering classes, and the more advanced the course, the greater the difference in enrollment by gender (Murray, Hirt, & McBee, 1999). For example, Oregon State University's College of Engineering is comprised of only 14% female

and 86% male (Oregon State University 2000 Fact Book). Massachusetts Institute of

Technology, the top engineering program in the country and Stanford University, the

second-best engineering program in the country, both enrolled 21% female and 79%

male during the 1999 – 2000 academic year (U.S. News, 2001). Women who express

interest in, or take computer classes report a significantly higher number of female

role models than those who do not express interest or complete such courses (Arenz &

Lee, 1990). While the reasons for gender differences with respect to computer use

need to be more fully investigated, this initial study suggests that there are differences

between men and women when it comes to using technology to apply to college.

Gender is not the only issue this study examines. Previous research has

suggested that underrepresented populations are hindered by limited technology skills

(Anderson, 1995; Chisholm, Carey, & Hernandez, 1998; Coley et al., 1997; Gladieux

& Swail, 1999; Hoffman & Novak, 1998a, 1998b; Kiernan, 1998; Kohl, 1996;

Molotsky, 1999; Murray, Hirt, & McBee, 1999; National Telecommunications and

Information Administration, 1999; Oder, 1999; Raloff, 1998; Roach, 1999; Scott,

1995; StudentPol, 1996, 1998; Terrell, 1999; The Great Equalizer, 1999; Tucker,

1999; Wilson, 1995). Results of the present study support these findings. In general,

since minorities are underrepresented in higher education, and underrepresented

students in this study were less likely to apply for admission electronically, campuses

considering online admission procedures may wish to consider the impact of such

procedures on future applicant pools. When the results of the present study are

coupled with those of previous research, administrators might be well served to

consider any policy related to increasing use of technology exclusively in light of its potential impact on underrepresented students.

Of the 18.6 % who applied online, 77.6 % were students of White/Caucasian in background and combined, only 5.1 % were of Hispanic, Pacific Islander, and of African-American descent. Socioeconomic status might explain some of these differences. Students of higher socioeconomic status are more likely to have a computer in their homes than students of a lower socioeconomic status and having a computer in the home has been shown to have a direct effect on computer literacy (Sparks, 1986). The inequities suggest that future college students will matriculate with significantly different levels of exposure to and experience with technology. Yet colleges and universities increasingly are using technology and expect their students to do the same. In conclusion, those of a lower socioeconomic status may be at a disadvantage both in getting to college and succeeding after they are admitted.

Besides the gender and race issues, age also plays a role in access to information resources. It was found that eighteen and nineteen year-old students predominantly applied to Oregon Sate University during the 1999 – 2000 academic year, making up 94.4% of the 528 sampled. The oldest student who applied to OSU online was 27 years of age, whereas four students over the age of 30 applied via the paper-based application, the oldest of whom was 43 years of age. Age seems to be becoming determinative of computer ownership.

Non-traditional students may choose to not apply online because they are not aware of the online application as a possible resource. The average eighteen and

nineteen year old may be applying as a senior in high school and has the counseling center available to them as a resource. High school counseling centers around the country are encouraging their students to apply to multiple institutions via the web. The advantages to this is that families can save money on postage, and some institutions waive the application fee if students apply online (Oregon State University does not waive the fee). Non-traditional students may not be as informed as high school students that online applications are becoming more common.

Despite the growing numbers of students utilizing technology in the admission process, the first part of this study has shown that female students, underrepresented students, and non-traditional students at Oregon State University, during the 1999 – 2000 academic year, still do not utilize the electronic application process as much as their majority counterparts. In general, the online application process at Oregon State is being underutilized since only 18.6% (98 out of 528) of students applied via the web.

Part II—Results of Telephone Interview

Data collected from the one-on-one telephone interviews was analyzed using themes. There were several issues that arose out of the interview with the 48 Oregon State University students. The main issue that the underrepresented students claimed prevented them from applying to Oregon State University online during the 1999 – 2000 academic year was that the University requires a credit card in order to pay the application fee. As one underrepresented student stated, "To apply to Oregon State

University online, a credit card is needed. My family does not have a credit card so I was unable to apply online." In order for OSU to be inclusive of all ethnic and socioeconomic populations, the institution must develop an alternative form of payment to accommodate students or families who may not have a credit card.

It was established in Part I of this study that socioeconomic status is one of the key factors influencing computer access. There is yet one more aspect which adversely effects computer access by underrepresented students: the credit card requirement. As a result, since institutions are aware that socioeconomic statuses influence computer access, it is difficult to understand why they would again require a credit card, which only those with a higher socioeconomic status may have, in order to access the online application process. This, in effect, may limit students from a lower socioeconomic class from utilizing an institution's electronic application.

The findings of this study, with respect to type of application, are more difficult to interpret. Online applicants are significantly more likely to apply for regular, rather than early admission. An early admission application suggests that the applicant is committed to the institution and will matriculate if admitted. Perhaps the findings of this study suggest that applying online is quick and easy, allowing students to procrastinate and preventing any early admission application. For public institutions like Oregon State University, which may prefer to confirm their entering classes though the early admission process, the present findings suggest that online admission systems may limit their ability to achieve this outcome.

Another issue that became evident from the telephone interviews was the importance of privacy when applying to a college or university. Students who applied via the paper and online applications, regardless of ethnic background, claimed that they felt most comfortable applying to college in the privacy of their own home. Students stated that they felt uncomfortable utilizing their high school computer labs because the laboratories were only open during lunch or after school for a couple of hours. Two hours was not enough time to complete the OSU online application, especially since you cannot save the application. Once a student has begun to complete OSU's online application, they must virtually complete it within one sitting. In addition, having private forms such as high school transcripts and recommendations lying out in plain view for other students and teachers to see caused some students to shy away from using a high school or library as a location for applying to college. This may be another reason students who did not have home computers chose to apply to OSU using the paper application. One underrepresented student stated, "I do not have access to a computer and the Internet at home so I decided to call Oregon State and inquire about the paper application." Most students felt that the privacy and safety of there own home was the ideal location to complete the application process.

The final issue to be addressed which became evident from the telephone interviews was that students who had developed a relationship with their admission representative from Oregon State preferred to apply to the University using the paper application rather than the online application. Students stated that they would receive a letter or a personal note from the representative and a paper application would be

included in the packet. Students confirmed that the process was so personal, on the University's end, that they wanted to return the paper application and make their part of the application process personal. Many of the telephone interviewees also believed that they would have a better chance of being admitted if they applied via the paper application rather than the online application. The students believed that the paper application would be taken more seriously because an individual applying online can apply to numerous institutions via the online application.

Besides providing pertinent information regarding the online and paper application process, the 48 students who participated in the telephone interview were asked to disclose certain personal demographic information. Most participants disclosed their family income. Regardless of application type (online vs. paper), more Caucasian students claimed their families made more than $75,000 per year. When students who applied via the paper application process were asked whether they would have a computer while attending Oregon State, 91.7% of Caucasian students stated they would while only 58.3% of underrepresented students stated that they would have a computer in their room.

Lastly, although students varied in technological abilities before coming to Oregon State University, all 48 students stated that they had utilized a computer and online services (either in their room, a friend's computer, the library, etc.) the day of the telephone interview. This leads OSU to believe that they may be integrating students into technology. Some of this is occurring by web registration, online access to the Valley Library (students are able to complete a good portion of their research

without leaving their rooms), and instructors are developing webpages where students can retrieve assignments, course syllabi, class readings, notes, and more information regarding a particular course.

Implications for Practice

All of the results of this present study should be considered in light of the limitations of the study. For one, the research was conducted on data from a single institution. It is possible that there is some exception in the type of students attracted to the OSU campus, that influenced the results in some unforeseen way. In addition, speaking with students immediately after they experience the college application process would have been positive. Students tended to forget details about their application experiences (date of application, location, etc.).

A second limitation of this study related to the number of electronic applicants for inclusion in the sample. Only 98 of the 528 applicants applied to OSU online. It is possible that a larger sample would have yielded different results. For example, only four African-American students and only seven Pacific Islander students applied to Oregon State University online during the 1999 – 2000 academic year. The male/female ratios may have been skewed since only this small sample size was available for study.

It is clear that the present study represents only an initial investigation into the outcomes associated with the online admissions systems and the use of technology on campuses in general. As noted, further research on the influence of socioeconomic

status is warranted, as are studies that examine the issue over time. Other scholars may wish to examine the online admission systems at different types of institutions. Understanding the differences in outcomes associated with the online admission systems between small liberal arts colleges, community colleges, state institutions, or historically Black institutions might offer insight into the influences of such systems on applicant pools.

Another promising area for further research relates to other characteristics of applicants. The present study examined demographic characteristics of online versus paper applicants. Research that explores less quantifiable elements of applicants, such as their involvement in high school co-curricular activities and how that involvement relates to their use of technology, might further an institution understand the question of what prompts students to use certain methods of application.

Finally, scholars should expand on the present study by examining high school settings. More information about access to, and use of, technology among high schools by size, location, region, and socioeconomic status of students may inform colleges and universities about the impact that online admission systems might have on potential applicant pools.

Despite the limitations of this study and the need for further research, the present research illustrates the potential problems that can arise when utilizing the online application process. In this case, the limited use of the online admission application by underrepresented students had some unanticipated consequences for the university's goal of increasing diversity among students. As institutions continue to

develop applications of technology, it becomes increasingly important to examine the outcomes associated with those applications and to explore the implications of those outcomes in conjunction with other institutional objectives.

Current and emerging uses of technology can bring positive changes to the delivery of student services and the design of programs intended to promote student involvement and learning. Admission professionals need to grapple with many critical issues that have developed with the increased use of technology, including strategic planning process needs, financial and infrastructure issues, policy implications, and ethical considerations. By using technology to admit students to an institution, tap students' attitudes, track trends in student needs, and signal issues that need resolution, admission personnel can establish the flow of information that is essential for enabling all divisions of the university to understand students. The acceptance of information technology has become a necessity for colleges and universities. Students demand access to these technologies in order to gain the knowledge and skills they need to compete in the job world. As admission professionals, we have the responsibility to meet this need. With admission leadership in areas of planning, implementation, and campus-wide collaboration, information technology can significantly improve student learning and change the way in which students are educated for years to come.

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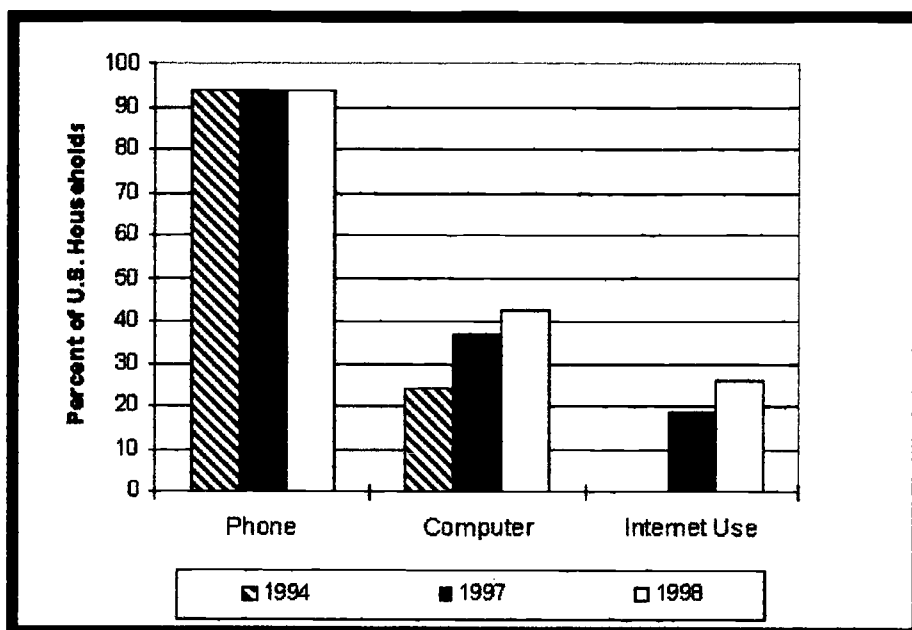Wilson, T.F. (1995). High tech High: Cruising on the internet. NASSP Bulletin, 79, 84-98.

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APPENDICES

APPENDIX A

U.S. HOUSEHOLDS WITH A TELEPHONE, COMPUTER, AND INTERNET USE

**Percent of U.S. Households with a Telephone,
Computer, and Internet Use
1994, 1997, 1998**

Year	Phone	Computer	Internet Use
1994	93.8	24.1	---
1997	93.8	36.6	18.6
1998	94.1	42.1	26.2

Figure 1: Data from 1998 reveal U.S. households are significantly more connected by telephone (94.1 percent). U.S. households jumped 5.5 percentage points (36.6 percent in 1997 versus 42.1 percent in 1998) when talking about computer connection and 7.6 percentage points (18.6 percent in 1997 versus 26.2 percent in 1998) when discussing Internet use (National Telecommunications and Information Administration, 1999).

APPENDIX B

PERCENT OF U.S. PERSONS USING THE INTERNET BY LOCATION

73

**Percent of U.S. Persons Using the Internet
By Location
1998**
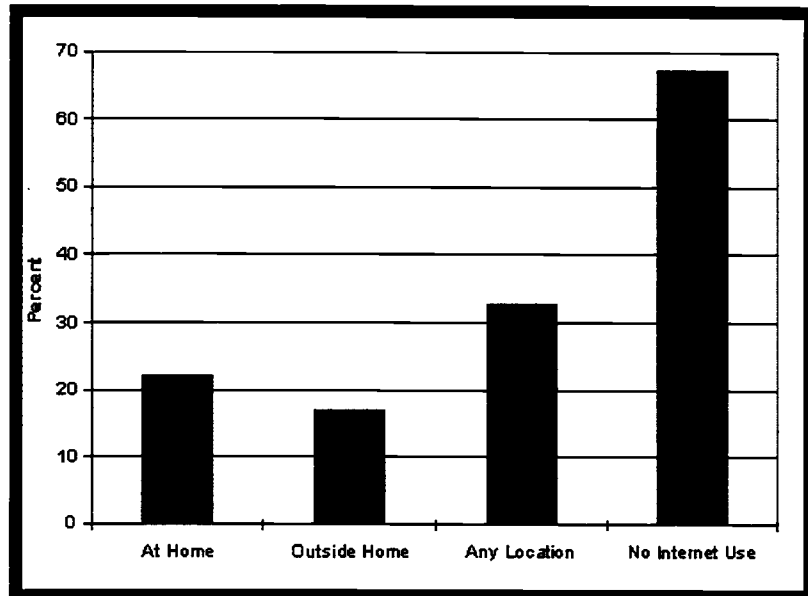
Population	At Home	Outside Home	Any Location	No Internet Use
U.S. Persons	22.2	17.0	32.7	67.3

Figure 2: Students have the option of accessing the Internet from a variety of locations. A person can connect from home or select another site, such as work, school, the library, or a community center. Among all Americans, 22.2 percent currently use the Internet at home, while 17.0 percent use it at some site outside the home. Approximately two-thirds (67.3 percent) do not use the Internet at all (National Telecommunications and Information Administration, 1999).

APPENDIX C

PERCENT OF U.S. HOUSEHOLDS WITH COMPUTERS BY RACE/ORIGIN

Percent of U.S. Households with Computers
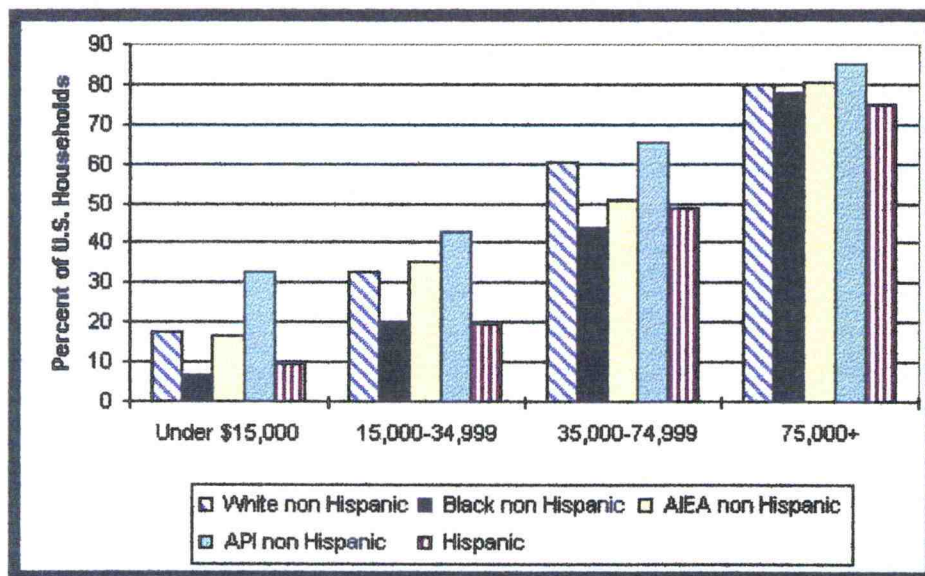## By Race/Origin
1984-1998 (Selected Years)
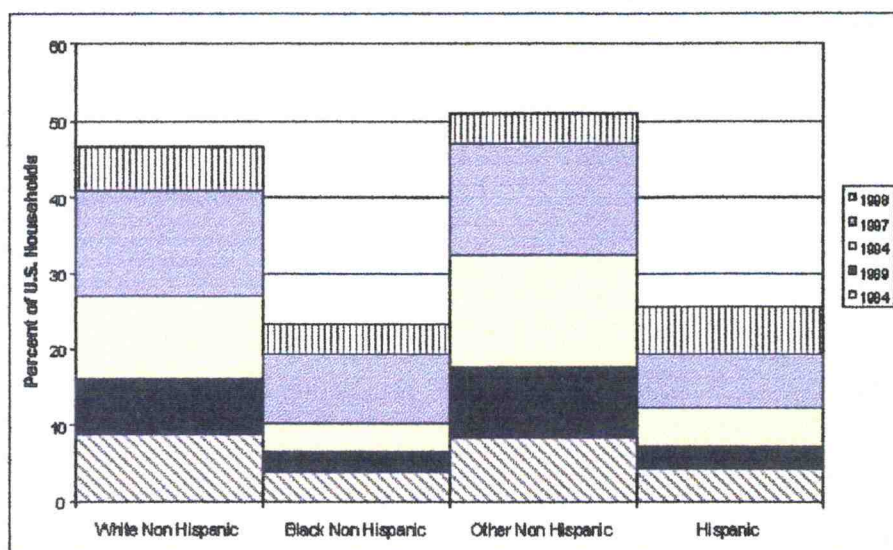
Race/Origin	1984	1989	1994	1997	1998
White Non Hispanic	8.8	16.0	27.1	40.8	46.6
Black Non Hispanic	3.8	6.6	10.3	19.3	23.2
Other Non Hispanic	8.4	17.6	32.6	47.0	50.9
Hispanic	4.3	7.1	12.3	19.4	25.5

Figure 3: Race/Origin remains closely correlated with computer ownership. In 1984, White households owned nearly twice the number of PCs as Black and Hispanic households. On the other hand, "Other Non Hispanic" households trailed White households by only 0.4 percentage points. Between 1984 and 1998, White households' penetrating rates increased approximately fivefold, and all other race/ethnic groups experienced approximately a sixfold increase. Because of their similar growth rates, White households continued to own computers at a rate roughly twice that of Black and Hispanic households in 1998. Beginning in 1989, however, "Other Non Hispanic" began to exceed all groups in PC ownership (National Telecommunications and Information Administration, 1999).

APPENDIX D

U.S. HOUSEHOLDS WITH A COMPUTER BY INCOME, RACE/ORIGIN

Percent of U.S. Households with a Computer
### By Income
By Race/Origin
1998

Race/Origin	Under $15,000	$15,000 – $34,999	$35,000 – 74,999	$75,000 +
White non Hispanic	17.5	32.5	60.4	80.0
Black Non Hispanic	6.6	19.4	43.7	78.0
AIEA Non Hispanic	16.8	35.3	50.9	80.5
API Non Hispanic	32.6	42.7	65.6	85.0
Hispanic	9.4	19.8	49.0	74.8

Figure 4: Income does influence the trend of computer ownership. Black households earning less than $15,000 are at the opposite end of the spectrum from high income Asians/Pacific Islanders (API) for PC ownership (6.6% versus 85.0%). As a trend, Black and Hispanic families, regardless of income level, have less computer ownership than other ethnic groups. Research has shown that the higher the income, the more opportunity for a family to own a computer (National Telecommunications and Information Administration, 1999).

APPENDIX E

PERCENT OF U.S. HOUSEHOLDS WITH A MODEM BY RACE/ORIGIN

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Percent of U.S. Households with a Modem
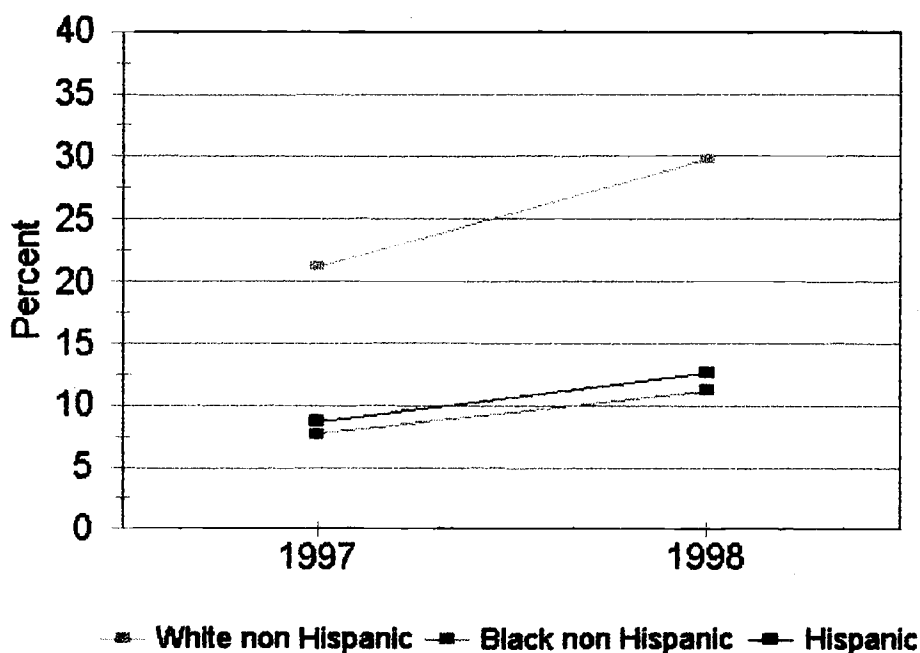## By Race/Origin
1989-1997 (Selected Years)
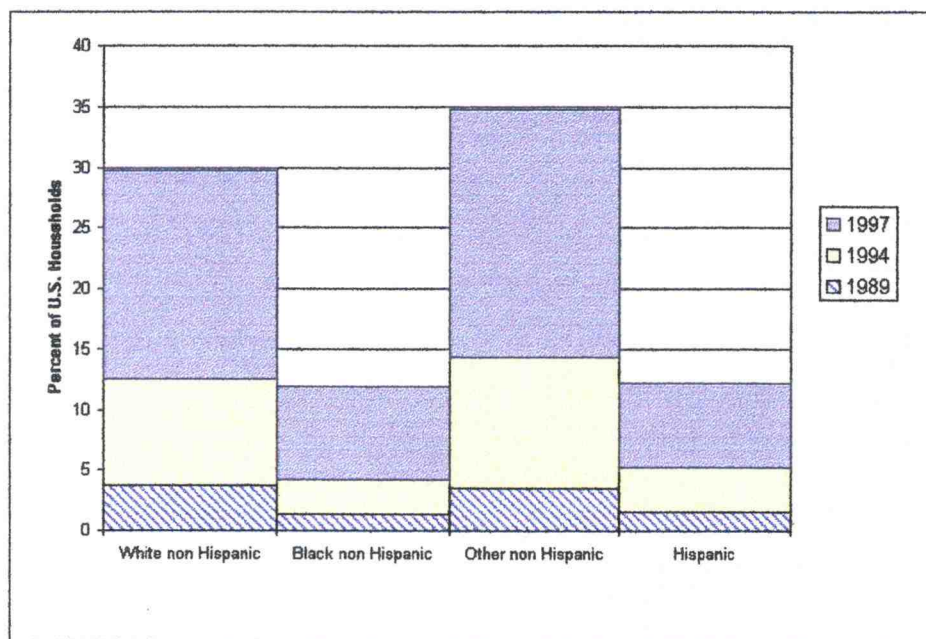
Race/Origin	1989	1994	1997
White Non Hispanic	3.7	12.5	29.7
Black Non Hispanic	1.3	4.2	11.9
Other Non Hispanic	3.5	14.4	34.8
Hispanic	1.5	5.2	12.2

Figure 5: Modem usage has also grown at a tremendous rate. Hispanic and Black Non Hispanic households have trailed in 1989, 1994, and 1997. White Non Hispanic and Other Non Hispanic households own over twice the number of modems as Hispanic and Black Non Hispanic households (National Telecommunications and Information Administration, 1999).

APPENDIX F

PERCENT OF U.S. HOUSEHOLDS USING THE INTERNET BY RACE/ORIGIN

**Percent of U.S. Households Using the Internet**
By Race/Origin
1997-1998

-- White non Hispanic --- Black non Hispanic --- Hispanic

Race/Origin	1997	1998
White Non Hispanic	21.2	29.8
Black Non Hispanic	7.7	11.2
Hispanic	8.7	12.6
12.5 vs. 17.2 percentage point difference between Whites and Hispanics		
13.5 vs. 18.6 percentage point difference between Whites and Blacks		

Figure 6: The digital divide has turned into a "racial ravine" when one looks at access among households of different races and ethnic groups. With regard to computers, the gap between White and Black households grew from a 13.5 percentage point difference in 1997 to a 18.6 percentage point difference in 1998. For White versus Hispanic households, the gap similarly rose from a 12.5 gap in 1997 to a 17.2 gap in 1998 (National Telecommunications and Information Administration, 1999).

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APPENDIX G

HOUSEHOLDS USING THE INTERNET AT HOME BY RACE/ORIGIN, LOCATION

Percent of U.S. Persons Using the Internet at Home
By Race/Origin
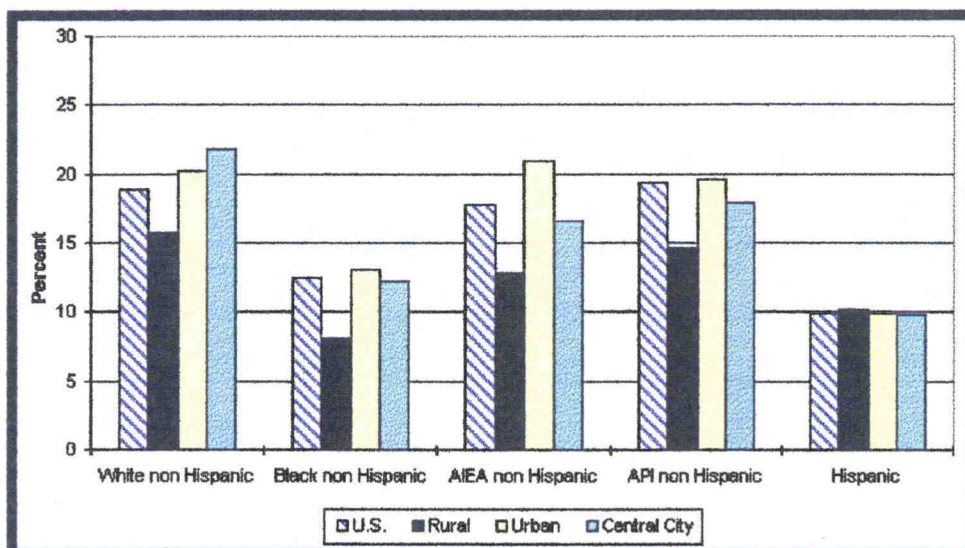### By U.S., Rural, Urban, and Central City Areas
1998
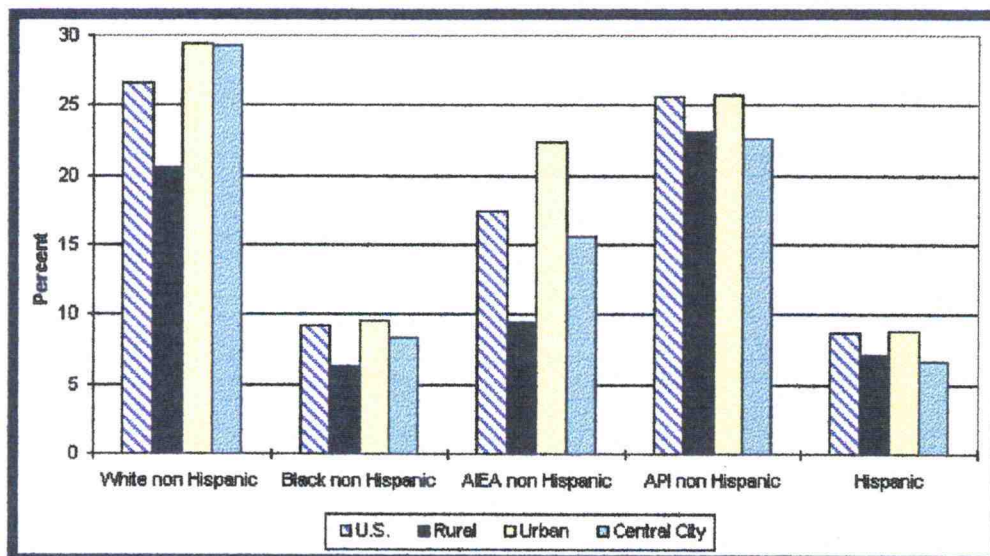
Race/Origin	U.S.	Rural	Urban	Central City
White Non Hispanic	26.7	20.6	29.4	29.3
Black Non Hispanic	9.2	6.3	9.6	8.4
AIEA Non Hispanic	17.5	9.4	22.3	15.6
API Non Hispanic	25.6	23.1	25.7	22.7
Hispanic	8.7	7.1	8.8	6.7

Figure 7: Asians/Pacific Islanders (API) and Whites have relatively greater access to the Internet at home, while American Indians/Eskimos/Aleuts (AIEA), Blacks, and Hispanics more often turn to access outside the home. The highest usage of the Internet is by urban Whites (29.4 percent), while the least usage is found among rural Blacks (6.3 percent) (National Telecommunications and Information Administration, 1999).

APPENDIX H

PERSONS USING THE INTERNET OUTSIDE THE HOME BY RACE, LOCATION

**Percent of U.S. Persons Using the Internet Outside the Home
By Race/Origin
By U.S., Rural, Urban, and Central City Areas
1998**

Race/Origin	U.S.	Rural	Urban	Central City
White Non Hispanic	18.8	15.8	20.2	21.8
Black Non Hispanic	12.4	8.2	13.0	12.2
AIEA Non Hispanic	17.8	12.8	20.9	16.5
API Non Hispanic	19.4	14.6	19.6	18.0
Hispanic	10.0	10.1	9.9	9.8

Figure 8: Blacks and Hispanics are less connected everywhere (the home, school, library, or community centers). Outside of the home, Whites in central cities (21.8 percent) have more access to the Internet than rural Blacks (8.2 percent) (National Telecommunications and Information Administration, 1999).

APPENDIX I

PERCENT OF U.S. HOUSEHOLDS WITH E-MAIL BY RACE/ORIGIN

Percent of U.S. Households with E-mail
By Race/Origin
1994, 1998
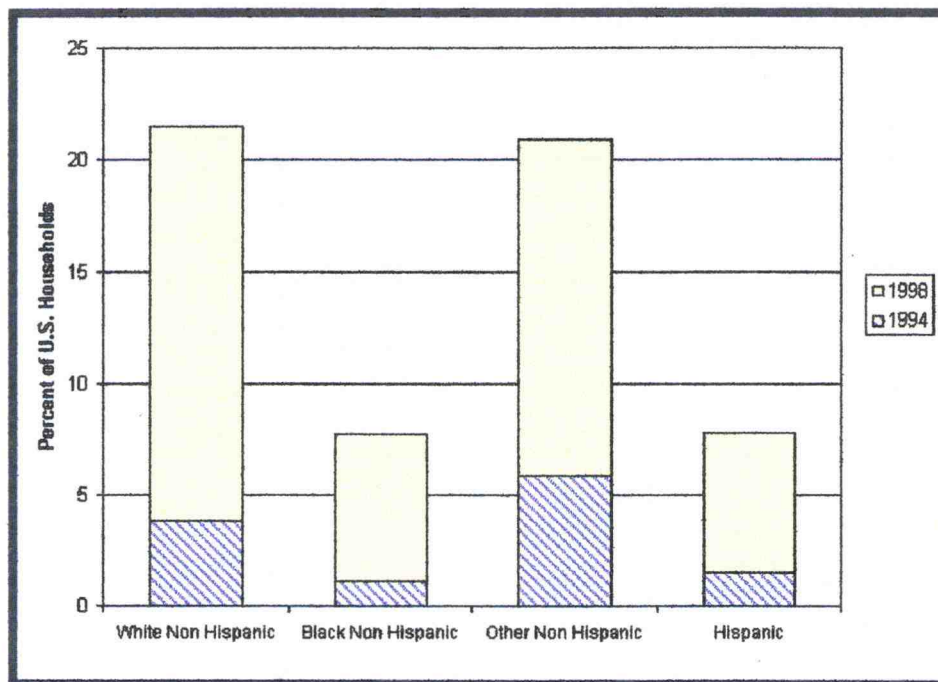
Race/Origin	1994	1998
White Non Hispanic	3.8	21.5
Black Non Hispanic	1.1	7.7
Other Non Hispanic	5.8	20.9
Hispanic	1.5	7.8

Figure 9: E-mail usage has grown at a tremendous rate during the 1994-1998 interval. Usage by all races or ethnic origins grew at least 3.5 times during the span. Black and Hispanic household usage remained substantially behind Whites and Non Hispanics in both 1994 and 1998. The digital divide more than quintupled during the period (National Telecommunications and Information Administration, 1999).

APPENDIX J

COMPUTER ACCESS AND WEB USE AMONG NON-STUDENTS & STUDENTS

Computer Access and Web Use
Among Non-Students and Students
1998

	(1) Full sample		(2) <$40,000 income		(3) $40,000+ income		(4) High school or less		(5) Some college		(6) All students		(7) Have home PC		(8) No PC at home	
	Whites N=4806	Blacks N=493	Whites N=1833	Blacks N=213	Whites N=1916	Blacks N=131	Whites N=1794	Blacks N=210	Whites N=2176	Blacks N=239	Whites N=336	Blacks N=64	Whites N=247	Blacks N=22	Whites N=89	Blacks N=42
Own home computer	44.3*	29.0*	27.5*	13.3*	61.2	65.4	27.0*	16.4*	57.7*	49.3*	73.0*	31.9*	100	100	0.0	0.0
PC access at work	38.5	33.8	25.9	20.7	59.1*	76.7*	24.2	18.4	55.0*	63.9*	27.0	24.0	30.1	32.3	18.6	20.1
Buy PC in 6 months	16.7*	27.2*	14.3*	23.4*	20.4*	35.7*	12.6*	23.3*	19.4*	28.5*	26.3	40.3	22.3	9.3	37.1	54.8
Internet TV interest	11.8	14.9	9.2	9.4	15.0*	23.9*	8.2	12.3	13.6	16.5	23.5	21.4	26.7	26.6	14.9	19.0
Ever used Web	26.0	22.0	13.0*	7.5*	38.7	38.6	10.1	11.5	36.5	29.2	65.8*	48.6*	72.1	63.8	48.8	41.5
...in past 6 months	22.4*	16.6*	10.4*	4.7*	32.5	36.2	8.2	7.4	31.6	26.5	58.9*	31.1*	66.7	63.6	37.8*	15.9*
...in past 3 months	20.5*	14.9*	9.5*	4.3*	29.9	33.8	7.6	5.9	29.2	24.7	51.9*	28.8*	58.9	56.5	32.8	15.9
...in past month	17.8*	9.7*	8.1*	2.5*	26.5	24.3	6.7*	3.3*	25.3*	16.6*	44.9*	19.8*	51.8	35.4	26.2	12.4
...in past week	12.9*	5.8*	5.9*	1.1*	19.2	17.1	4.7*	1.4*	18.6*	11.6*	31.9*	9.9*	39.0	20.6	15.5*	4.6*
...at home	14.7*	9.0*	6.4*	2.4*	22.3	22.8	5.3	3.4	21.6	16.9	33.3*	13.0*	43.6	36.6	5.5	1.9
...at work	11.1	8.4	4.9	3.7	19.8	24.5	3.6	5.0	19.2	16.8	8.8*	2.0*	11.4	6.3	1.9	0.0
...at school	7.2	10.9	2.8	2.6	8.6	8.5	1.9*	5.9*	6.9	6.9	45.5	42.8	48.3	49.3	38.1	39.5
...at other locations	7.3	5.3	4.4*	1.8*	8.9	12.6	2.8	3.3	8.4	9.0	23.5*	4.2*	24.0*	5.5	22.1*	3.7*

Table 2.1: Percentage (weighted) of individuals in each group responding positively concerning the variable specified in that row. Asterisks next to the numbers indicates that the difference between Whites and Blacks is statistically significant (P< 0.05). For example, column 6 in the table above reveals White students (31.9 percent) were significantly more likely than African-American students (9.9 percent) to have used the Web, especially in the past week (Hoffman & Novak, 1998a).

APPENDIX K

COLLEGE WEB SITES—AN IMPORTANT RESOURCE FOR STUDENTS

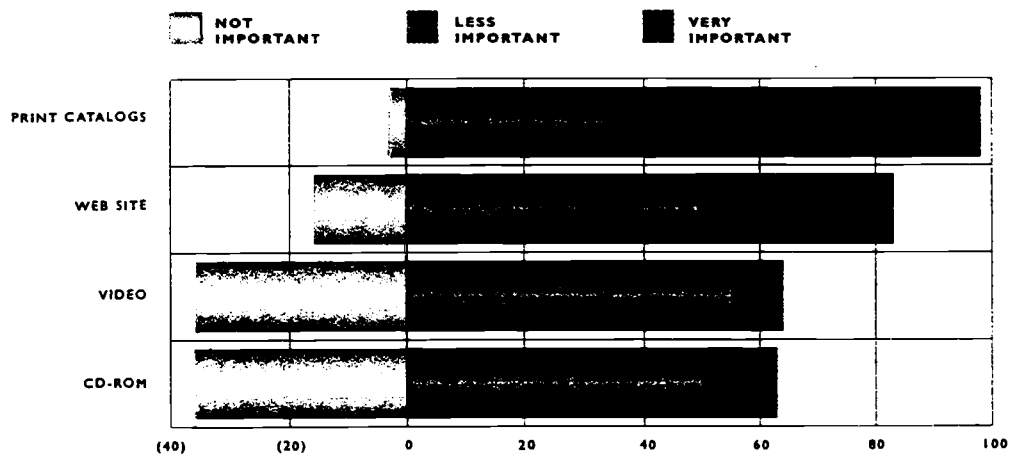## College Web Sites—An Important Resource
For Prospective Students

Figure 10: While college viewbooks and search pieces may be replaced catalogs in the recruiting mailing sequence, a majority of prospective students (34 percent) continue to view college Web sites as "very important." Video, sound, and other multimedia features on college Web sites has become an important recruiting tool (StudentPol, 1998).

APPENDIX L

CAMPUS LIFE: DON'T FORGET TO PACK THE LAPTOP

Campus Life: Don't Forget to Pack the Laptop

Total Enrollment in Higher Education Institutions Today:	
Number of Men	6.4 million
Number of Women	8.4 million

Total Enrollment in Higher Education Institutions in 2008:	
Number of Men	6.9 million
Number of Women	9.1 million

Percentage of all College Freshman who've used E-mail	65.9%
Percentage of Freshman at Black Colleges who've used E-mail	43.5%
Percentage of all College Freshman who used the Internet to do Homework in High School	82.9%
Percentage of Freshman at Black Colleges who used the Internet to do Homework in High School	78.8%

Table 2.2: During the Fall of 1998, a total of 14.8 million students (6.4 million men and 8.4 million women) were enrolled in higher education institutions. The Higher Education Research Institute estimates a total enrollment of 16 million students (6.9 million men and 9.1 million women) in 2008. More college freshman have used e-mail than freshman at black colleges (65.9% versus 43.5%). There are more college freshman that used the Internet to do homework in high school than freshman at black colleges who used the Internet to do homework (82.9% versus 78.8%). As a result, The Higher Education Research Institute encourages all students to bring a computer to college (Lach, 1999).

APPENDIX M

TELEPHONE INTERVIEW QUESTIONS FOR ONLINE APPLICANTS

1. What is your age:
   - ❑ Under 18 years
   - ❑ 18 – 20 years
   - ❑ 21 – 25 years
   - ❑ 26 – 30 years
   - ❑ 31 – 40 years
   - ❑ Over 41 years

2. What is your gender:
   - ❑ Female
   - ❑ Male

3. At Oregon State University, what is your student status?
   - ❑ Full-Time Student
   - ❑ Part-Time Student

4. What is your ethnic background: (*Please check ALL that apply*).
   - ❑ **Asian or Pacific Islander**: Persons having origins in any of the peoples of the Far East, Southeast Asia, the India subcontinent or the Pacific Islands. This area includes China, Japan, Korea, the Philippine Islands, & Samoa.
   - ❑ **African American, Black (not of Hispanic origin)**: Persons having origins in any of the black ethnic groups.
   - ❑ **Hispanic**: Persons having origins in any of the Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish cultures, regardless of ethnicity.
   - ❑ **Native American or Alaskan Native**: Persons having origins in any of the original peoples of North America and who maintain cultural identification through tribal affiliation or community recognition.
   - ❑ **White, European (not of Hispanic Origin)**: Persons having origin in any of the original peoples of Europe, North America, or the Middle East.
   - ❑ **Other**: (please specify and use your own description) _____
   - ❑ **Decline to Respond**

5. How would you classify your home city?
   - ❑ Rural
   - ❑ Urban
   - ❑ Central City
   - ❑ Other (please specify) _____

6. How would you classify your family's income?
   - ❑ Under $15,000/year
   - ❑ $15,000 – $34,999/year
   - ❑ $35,000 – $74,999/year
   - ❑ More than $75,000/year
   - ❑ Unknown

7. How many people are in your family <u>excluding</u> yourself? (*Please check ALL that apply*).
   □ 2-parent household
   □ 1-parent household
   □ 1 sibling
   □ 2-4 siblings
   □ More than 4 siblings

8. Are you the first member of your family to attend college?
   □ Yes
   □ No

9. Do you have any final comments that would help my research?

Thank-you for taking the time to speak with me. If you have any follow-up comments or questions, please contact me at 541-737-5678 or e-mail me at <u>Lori.Werth@orst.edu</u>.

APPENDIX N

TELEPHONE INTERVIEW QUESTIONS FOR PAPER APPLICANTS

The Application Process at Oregon State University
Paper Applicant Telephone Interview

Thank you for your willingness to participate in this survey. This interview should take approximately 20 minutes to complete. Please understand that your participation in this study is voluntary and you can refuse to participate or withdraw from the process at any time. Withdrawing from this study will in no way affect your status at Oregon State University. This telephone interview will be kept both anonymous and confidential.

Part I. Please respond to the questions I read to you honestly and thoughtfully based upon your personal experience(s).

1. Why did you apply to Oregon State University via the paper application instead of using the online application?

2. What are your impressions of the paper application process at Oregon State University?

3. How can Oregon State University make the paper application process more user-friendly?

4. Did you apply to other colleges or universities online? If so, what were your impressions of the other college's online application process? If not, why did you choose not to apply online?

5. What is your impression of the online application process in general? Is the application information easy to access?

6. Did you find it difficult to access a computer in order to apply to Oregon State University online? (*please explain*)

7. In general, how would you rate your computer skills?

8. When did you last use the Internet or surf the Web?
   □ During the Past week
   □ During the Past Month
   □ During the Past 3 Months
   □ During the Past 6 Months

9. When applying to colleges last year, did your family own a computer or have Internet access?
   □ Yes
   □ No

10. Will you have a computer in your room while attending Oregon State University?
- ❑ Yes
- ❑ No

— — — — — — — — — — — — — — — — — — — —

Part II. Please tell us about yourself.

This section is for analytic purposes only. You may select to not answer any of the following questions. Please remember that this survey is completely anonymous, but there are certain demographics that may help us make sense of the data. Your name will not be connected to this research in any way. Thank you for your help.

1. What is your age:
   - ❑ Under 18 years
   - ❑ 18 – 20 years
   - ❑ 21 – 25 years
   - ❑ 26 – 30 years
   - ❑ 31 – 40 years
   - ❑ Over 41 years

2. What is your gender:
   - ❑ Female
   - ❑ Male

3. At Oregon State University, what is your student status?
   - ❑ Full-Time Student
   - ❑ Part-Time Student

4. My ethnic background is: (*Please check ALL that apply*).
   - ❑ **Asian or Pacific Islander**: Persons having origins in any of the peoples of the Far East, Southeast Asia, the India subcontinent or the Pacific Islands. This area includes China, Japan, Korea, the Philippine Islands, and Samoa.
   - ❑ **African American, Black (not of Hispanic origin)**: Persons having origins in any of the black ethnic groups.
   - ❑ **Hispanic**: Persons having origins in any of the Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish cultures, regardless of ethnicity.
   - ❑ **Native American or Alaskan Native**: Persons having origins in any of the original peoples of North America and who maintain cultural identification through tribal affiliation or community recognition.
   - ❑ **White, European (not of Hispanic Origin)**: Persons having origin in any of the original peoples of Europe, North America, or the Middle East.
   - ❑ **Other**: (please specify and use your own description) _____
   - ❑ **Decline to Respond**

5. How would you classify your home city?
   - □ Rural
   - □ Urban
   - □ Central City
   - □ Other (please specify) _____

6. How would you classify your family's income?
   - □ Under $15,000/year
   - □ $15,000 – $34,999/year
   - □ $35,000 – $74,999/year
   - □ More than $75,000/year
   - □ Unknown

7. How many people are in your family <u>excluding</u> yourself? (*Please check ALL that apply*).
   - □ 2-parent household
   - □ 1-parent household
   - □ 1 sibling
   - □ 2-4 siblings
   - □ More than 4 siblings

8. Are you the first member of your family to attend college?
   - □ Yes
   - □ No

9. Any final comments that would help us in our research?

Thank-you for taking the time to speak with me. If you have any follow-up comments or questions, please contact me at 541-737-5678 or e-mail me at <u>Lori.Werth@orst.edu</u>.

APPENDIX O

THANK-YOU POSTCARD

November 8, 2001

Last week an interview took place asking about your experiences while applying to
Oregon State University.

I am especially grateful for your help because only a small, representative sample of
students have been included in the study. Thank you for taking the time out of your
schedule of speak with me.

If by chance you may have any further questions or comments, please feel free to
contact me at (541) 737-5678.

Sincerely,

Lori Werth
Graduate Teaching Assistant

APPENDIX P

GROUP INTERVIEW REMINDER

**OREGON STATE
UNIVERSITY**

A Reminder for _____

We would love to hear your input on improving the Oregon State University application process.

<u>DATE</u>:

<u>TIME</u>:

<u>LOCATION</u>: 3rd Floor of the Library (Willamette East Seminar Room)

After the ½ hour to 45-minute discussion, there will be a drawing for a $20.00 gift certificate at the OSU Bookstore.

We appreciate your help!

Lori Werth
OSU Graduate Student
737-5678
Lori.Werth@orst.edu

APPENDIX Q

GROUP INTERVIEW QUESTIONS FOR ONLINE APPLICANTS

The Application Process at Oregon State University
Online Applicant Group Interview

My name is Lori Werth, an OSU graduate student who is working on my Masters Thesis project. Thank you for your willingness to participate in this group interview. This group interview is both anonymous and confidential. The group interview should take approximately 1 hour to complete. Please understand that your participation in this study is voluntary and you can refuse to participate or withdraw from the process at any time. Withdrawing from this study will in no way affect your status at Oregon State University. We thank you for your assistance and cooperation.

1) Why did you decide to apply to Oregon State University?

2) Did you apply to other institutions in addition to Oregon State University? Is so, how many?

3) If you applied to other institutions in addition to Oregon State University, how were your experiences with the application process?

4) Why did you choose to apply to Oregon State University online?

5) What facility (i.e. home, school, library, etc.) did you use when applying to Oregon State University online? Why did this particular facility appeal to you?

6) Do you think underrepresented/minority students might be disadvantaged by the online application process? If so, please explain? If not, please explain?

7) How could the online application process be improved at Oregon State University?

8) Did you consider applying to Oregon State University using the paper application? If so, why did you choose to not apply via this method?

9) Do you have any final comments that would help us better understand your experience(s) with the online application process at Oregon State University?

Thank-you for taking the time to speak with me. If you have any follow-up comments or questions, please contact me at 541-738-8722 or e-mail me at Lori.Werth@orst.edu.

APPENDIX R

GROUP INTERVIEW QUESTIONS FOR PAPER APPLICANTS

The Application Process at Oregon State University
Paper Applicant Group Interview

My name is Lori Werth, an OSU graduate student who is working on my Masters Thesis project. Thank you for your willingness to participate in this group interview. This group interview is both anonymous and confidential. The group interview should take approximately 1 hour to complete. Please understand that your participation in this study is voluntary and you can refuse to participate or withdraw from the process at any time. Withdrawing from this study will in no way affect your status at Oregon State University. We thank you for your assistance and cooperation.

1) Why did you decide to apply to Oregon State University?

2) Did you apply to other institutions in addition to Oregon State University? Is so, how many?

3) If you applied to other institutions in addition to Oregon State University, how were your experiences with the application process?

4) Why did you choose to apply to Oregon State University using the paper application?

5) Did you consider applying to Oregon State University using the online application? If so, why did you choose to not apply via this method?

6) What is the number one reason that prevented you from applying to Oregon State University online? Please explain.

7) Do you think underrepresented/minority students might be disadvantaged by the online application process? If so, please explain? If not, please explain?

8) How could the application process be improved at Oregon State University?

9) Do you have any final comments that would help us better understand your experience(s) while applying to Oregon State University?

Thank-you for taking the time to speak with me. If you have any follow-up comments or questions, please contact me at 541-738-8722 or e-mail me at Lori.Werth@orst.edu.

APPENDIX S

CONSENT FORM FOR GROUP INTERVIEW

Consent Form for Group Interview

My name is Lori Werth and I am a graduate student in the College Student Services Administration Program at Oregon State University. I am working on my thesis project for the Masters of Science Degree.

You have been asked to participate in this interview based upon a random selection of first-year Oregon State University students. I am interested in the experiences first-year students had when applying to OSU online or via the paper-based application.

This tape-recorded group interview will take approximately 1 hour. All personal data will be kept confidential. Your name will never be associated with your responses. The tape-recorded interviews will be destroyed after my research is completed. The results of the research will be available for those who wish to see my findings.

If you wish to withdraw from the study, you may do so at any time.

If you have any questions about this study, feel free to ask me or my Supervisor, Dr. Roger Penn, at the College Student Services Administration Program. You can reach Dr. Penn by e-mail at Roger.Penn@orst.edu or by telephone at 541-737-3655.

I understand that in order to participate in this study I must be 18 years of age or older. I understand this group interview will be tape-recorded, all information will be kept confidential, and the tapes will be destroyed at the end of this project. I also understand that my participation in this study is voluntary and that I can refuse to participate or withdraw from the process at any time.

_____

Signature of the Participant   Date

_____

Lori L. Werth, Masters of Science Candidate   Date
E-mail: Lori.Werth@orst.edu
Office Phone: 541-737-5678