

GENDER AND INTERNET USAGE

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February 2003

Prepared for *The Internet Encyclopedia*, edited by Hossein Bidgoli, New York: Wiley, 2003
(forthcoming).

Acknowledgments: The authors are grateful to multiple reviewers of *The Internet Encyclopedia* for detailed and valuable comments on earlier versions of this chapter.

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Glossary

Adoption of an innovation is a micro process that focuses on the stages through which an individual passes when deciding to accept or reject the innovation.

Depth of adoption of a technology is the variety and extent of usage of the acquired technology and/or the purchase of related products.

Functional depth of adoption of a technology is the frequency that a multifunctional technology such as the Internet will be used for a particular function (e.g., for shopping).

Gender is the “social constructed roles ascribed to males and females. These roles, which are learned, change over time and vary widely within and between cultures” (United Nations Definition). While Sex and Gender are often used interchangeably, it is important to note that Sex is a biological variable while Gender is a social construct. The adjectives/nouns “male” and “female” are typically employed in a biological sense while the adjectives “masculine” and “feminine” are typically employed in a gendered, social sense.

Gender-related development index (GDI) is a composite index measuring average achievement in the three basic dimensions captured in the human development index—a long and healthy life, knowledge and a decent standard of living—adjusted to account for inequalities between men and women.

Gross domestic product (GDP) is the sum of the total value of consumption expenditure, total value of investment expenditure, government purchases of goods and services.

HTTP is the Hyper-Text Transfer Protocol. It is the most popular network protocol for exchanging documents on the **World Wide Web**.

Information and communications technologies (ICTs) include technologies that facilitate the capturing, processing, storage and transfer of information.

Internet refers to the “global information system that (i) is logically linked together by a globally unique address space based on the Internet Protocol (IP) or its subsequent extensions/follow-ons; (ii) is able to support communications using the Transmission Control Protocol/Internet Protocol (TCP/IP) suite or its subsequent extensions/follow-ons, and/or other IP-compatible protocols; and (iii) provides, uses or makes accessible, either publicly or privately, high level services layered on the communications and related infrastructure described herein” (The Federal Networking Council (FNC)’s definition).

Total or overall depth of adoption of a technology could be measured by the total time spent using the technology in a given period of time (e.g., per month).

Width of adoption of a technology is the number of people within the adoption unit who use the product, or the number of different uses of the product.

World Wide Web (WWW) consists of the HTTP and HTTPS protocols, which allow users to jump from one HTML document on the **Internet** to another.

ABSTRACT

This chapter examines the nature and sources of gender disparity in the adoption and usage of information and communications technologies (ICTs), especially the Internet. Various levels of gender disparity exist in the adoption of the Internet. Moreover, the disparity varies widely across the globe. These gender disparities are functions of factors such as male-female cultural differences; differences in specialization, preferences for jobs, and education; complex interactions among the features of the Internet and gender; and external variables such as sociocultural and economic factors. If appropriate policy measures are taken in the public sector and the corporate world, then some of the sources of gender disparity in Internet adoption and usage can be overcome and the gender related digital divide could be bridged.

INTRODUCTION

Modern information and communications technologies (ICTs) such as the Internet arguably have the potential to offer greater benefits to women than men (Carter and Grieco 2000; UNCTAD 2002). For instance, new ICT applications such as changing a health service appointment electronically can “return” the time lost by single mothers under conventional arrangements that require travel to a clinic for such tasks (Carter and Grieco 1998). In reality, however, a significant gender bias toward men exists in the adoption of modern ICTs, including the Internet. For instance, the user survey conducted by Graphic, Visualization, & Usability Center (GVU) in 1998 found that 66.4% of the Internet users in the world were men and 33.6 % were women (GVU Center 1998). In 2000, the bias still persisted in most parts of the world, with the exception of USA and Canada. Understanding of the Internet’s evolution over time and space, therefore, is incomplete unless we understand the role and influence of gender in the processes of Internet adoption and usage.

Most available statistics on Internet usage tend to utilize gender interchangeably with sex even though sex is a biological characteristic while gender is “social constructed roles ascribed to males and females. These roles, which are learned, change over time and vary widely within and

between cultures” (United Nations Definition). While the current reporting of data on the Internet and gender does not adequately capture the cultural and changing differences in gender roles, the data does provide a view of some of the differences in ways men and women use the Internet. It underscores the importance of “Gender and Internet Usage” as a topic and the need for an explanation for phenomena such as the following¹:

- In USA and Canada, proportions of Internet users seem to parallel gender proportions in the population but in other advanced economies such as Sweden and Japan, men still account for a larger portion of the Internet using population.
- In some countries, women Internet users have increased dramatically. For example, between 1999 and 2000 the proportion of women Net users jumped from 33% to 42% in Mexico, and from 25% to 43% in Brazil.
- While women represent nearly 50% of the labor force in Asia, and own more than one-third of small and medium businesses in the region, in 2000 they accounted for only 22% of Internet users on average.
- In Africa, women’s participation in Internet usage continues to be low, ranging from 12% in Senegal to 38% in Zambia.

In this chapter, we address the following questions:

- What is the nature of gender bias in Internet adoption and usage?
- Is the bias changing over time and space?
- How can the bias be effectively profiled and expressed?
- What factors explain the variation of the bias within and across countries?
- Why do men and women tend to use the Internet for different purposes?

We utilize country-level Internet usage data obtained from various sources to address these questions. These multiple sources have utilized a variety of methods to collect, analyze, and represent data and such heterogeneity in data imposes several limitations on their use and interpretation. Lacking a single, comprehensive study based on a consistent approach to the collection of data globally, we have relied on available heterogeneous data to examine the gender

¹ These are based on a variety of sources, including: Brisco (2002), Hafkin (2001) and UNCTAD (2002).

relationships. The remainder of the chapter (a) examines the nature of gender bias in the adoption of the Internet, (b) discusses various possible sources of the bias, and (c) provides some conclusions. In this chapter, we use gender and sex interchangeably, to reflect the availability of data.

NATURE OF GENDER BIAS IN INTERNET ADOPTION

Global Variation

Precise data on Internet usage by gender are extremely difficult to obtain, especially from developing countries, and the available data lack reliability and comparability (UNCTAD 2002). Nonetheless, statistics on Internet access and use across countries (Table 1) reveal gender as one of the most important factors influencing Internet adoption and usage. The degree of gender bias in the adoption of the Internet varies widely across the world. As Table 1 indicates, among Internet users, the male-female ratio ranges from 94:6 in Middle East to 78:22 in Asia, 75:25 in Western Europe, 62:38 in Latin America, and finally 50:50 in USA. There is great variability even within a region. In Western Europe, for instance, the male-female ratio in Internet use varies from 70:30 in Italy to 55:45 in Germany.

Table 1 about here

In general, the proportion of female Internet users tends to be higher in countries with higher per capita incomes. For instance, countries in Western Europe and Oceania had higher proportions of female Internet users than lower income countries in Asia and Latin America. In the developing countries, women usually account for much smaller proportion of the total Internet population (Table 1). Adoption of any technology, including the Internet, requires investments in fixed capital as well as recurring variable costs. A lower income level implies that

users have to invest a higher proportion of their income in acquiring and using a technology.² The total perceived sacrifice in adopting the technology is, thus, higher for individuals with lower income levels. Women's per capita GDP worldwide is lower than that of men (Table 4, later) and women's per capita GDP as a proportion of men's per capita GDP varies widely across the world. The income disparity across sexes, thus, explains some of the gender disparities and global variations in Internet adoption and usage.

The proportion of female users is also higher among countries with longer history of Internet usage. For instance, in the early 2002, female Internet users were 46 percent in Sweden, 42 percent in Britain, and 39 percent in Germany and France. This proportion drops to 31 percent in Italy and 29 percent in Spain (CyberAtlas 2002a). Similarly, Brazil and Mexico – early-adopting Latin American nations – had higher proportion of female Internet users than other Latin American nations.

The gender gap in Internet adoption has been diminishing over time. Some statistics suggest that the gender gap may even be reversed in USA and Canada, but not in other countries. As presented in Figure 1, the gender bias in Internet adoption in the U.S. disappeared in 2000, and also started showing a reverse trend after that – with more women than men online.

Figure 1 about here

Width and Depth of Internet Adoption

Despite some evidence of the narrowing and even reversing gender bias as discussed above (Figure 1; Rainie 2002), further analysis indicates that the bias still persists in terms of *the*

² In developing countries, Internet availability in public venues such as Internet cafes obviates the need for fixed investments by individuals. There are, however, serious gender barriers that prevent women from going to such

width and depth of adoption – even in countries where the gender gap has seemingly disappeared. The concepts of *width and the depth* of technology adoption help extend the analysis of gender bias in Internet adoption. Gatignon and Robertson (1991) define the *width* of adoption as the “number of people within the adoption unit who use the product, or the number of different uses of the product” and the *depth* as “the amount of usage or the purchase of related products” (p. 468). Thus, higher *width* of Internet usage is associated with greater number of individuals within a household using the Internet, as well as greater number of different uses of Internet by a specific member of that household. For instance, a possible measure of the *width* of Internet adoption may be the number of different activities or applications (e.g., education, communication, information search, entertainment, etc.) for which Internet is used.

For a multifunctional technology such as the Internet, “depth” can have at least two different measures: one related to the usage of the technology for performing a particular function (*functional depth*) and the other related to the total usage of the technology (*overall depth*). In case of Internet, for instance, a possible measure of *functional depth* of “Internet adoption for shopping” could be the number of times per month an individual uses the Internet for shopping, or the total time per month spent shopping online. Total or *overall depth* of adoption of the Internet, on the other hand, could be measured by the total time spent using the Internet per month.

It is not surprising to find that men still outpace women on the Internet in terms of various usage measures (CyberAtlas 2002b) and this bias is evident even in countries where the overall ratio of Internet users has become gender-neutral. In 1997, a study conducted in Quebec, Canada, indicated that men were heavier users of the Internet than women (Figure 2). The study

public locations and using the Internet. Therefore, for women, lack of funds to buy a computer continues to be a barrier.

indicated that men spent 16 percent more time online than women, viewed more pages, and went online more often. As a result, Internet adoption tends to be *much deeper for men* than for women. This was also evident in a December 2000 study in the U.S. that indicated that men went online 20 times, spent 10 hours and 24 minutes and viewed 760 pages per month. The corresponding figures for women were 18 sessions, 8 hours and 56 minutes, and 580 pages respectively (Nua Internet Surveys 2001). Similarly, in Asia male Internet users in 2001 spent 14.5 hours per month online compared to 12 hours spent by women (Nua Internet Surveys 2001b, July 4).

Figure 2 about here

The *functional depth* of Internet adoption depends on the type of usage. For instance, compared to Spanish men, Spanish women tend to favor instant messaging sites and file sharing. In Asia, the functional depth of Internet adoption for visiting sports sites is higher for men than women. In Hong Kong, for instance, 10 percent more men visit soccer-related sites than women (Nua Internet Surveys 2002a).

Visits to various websites also show significant gender differences in USA and Canada as well as rest of the world (Table 2). Only in the case of Yahoo! did more women than men visit that site in the USA and Canada; the differences are more pronounced in the rest of the world (CyberAtlas 2002b).

Table 2 about here

A survey conducted in 2001 indicated that while 100 % of the female respondents using a computer in Rhode Island, U.S.A. used the email application, there were variations in usage locations (Dholakia et. al. 2002). Men, more than women, used email both at home and work; women tended to email mostly at work. For online shopping, the difference was even more pronounced with more men reporting being Internet shoppers and conducting shopping transactions from home as well as work (Table 3). When we examine shopping sites such as eBay and Amazon.com, men used these sites more than women in all parts of the world, including USA and Canada. The only exception, Amazon.com, was used by more women than men but only in USA and Canada (see Table 2 above).

Other studies report similar gender bias within the United States. Unilever (2001) suggests that online shoppers are more likely to be men than women and men dominate all shopping categories except health and apparel (Ebates.com 2000). Men not only report more incidences of Internet-shopping, they tend to be “heavy buyers”, spending over \$500 more online than women (48%) (Bhatnagar, Misra and Roy 2000). Men also exhibit considerable variation in Internet shopping behaviors while women tend to stick to “click-and-mortar” behavior patterns – “shopping” online but buying offline (What kind of Dot-shopper are you? 2000)

Table 3 about here

The *functional depth* of Internet adoption varies across age groups within a country as well as across countries. Among Internet users in the age group 18 to 24 years in the U.S., women prefer to visit *news and entertainment sites*, while men prefer *search engines and sports sites* (Nua Internet Surveys 2002b, July 12). Similarly, a survey conducted in the U.K. indicated that about 80 percent of men aged 55 and over used the Internet for searching information or for

pursuing their hobbies whereas 86 percent of women in the same age range preferred to use the Internet to communicate with friends and family (Nua Internet Surveys 2002c).

Similarly, gender composition of the online registrants at a local U.S. newspaper indicates that, for all age groups above 25, more men than women tend to register online (Figure 3).

Figure 3 about here

SOURCES OF GENDER BIAS IN INTERNET ADOPTION

Since the adoption of the Internet is a relatively new phenomenon, there is limited data on changes over time, particularly for countries outside USA. Based on available data, it is likely that the gender bias will largely disappear over time. For instance, data from online registrants at a newspaper site in the United States in 2002 (see Figure 3 above), clearly show the narrowing gender gap at younger ages until the pattern reverses itself for the 13-24 age group. For this egalitarian pattern to emerge for all age and income groups, and across all countries, several forces have to operate in a convergent manner. Figure 4 provides an overall framework that offers a perspective on various factors that contribute to the gender bias in the adoption of modern ICTs such as the Internet.

Figure 4 about here

There are several variables at the macro level that influence the overall environment in which decisions are made regarding technology – decisions regarding who designs the technology, what features are included in the design – that influence the usefulness and adoption patterns of technology. There are several factors also at the micro level that influence evaluation

and adoption of specific technologies. A complex interplay between these forces shape the gender-technology interactions and lead to gender symmetry or asymmetry in the overall adoption of a specific technology like the Internet as well as the width and depth of adoption.

Sociocultural Factors

Culture can be viewed as one of the components of external variables in the technology acceptance model (TAM) proposed by Davis (1989). Although men and women differ behaviorally in some ways everywhere, they do not always differ in the same ways or to the same degree. Cultural factors explain a significant proportion of such variations (Segall et. al. 1990). Such differences are likely to result in gender bias in Internet adoption in several ways. First, cultural factors determine the level of involvement of men and women in technology related decisions. Second, culture is one of the important factors in determining the likelihood of learning the skills required for Internet use. Third, culture influences the adoption of a technology by making the alternative technologies more or less attractive in performing a function. We describe each of these factors in the following paragraphs.

Women's Involvement in Decision-making

Cultural factors influence women's involvement in decision-making at various levels: household, organization, and national levels. Rahman and Kumar (1998) found limited participation of women in technology adoption decisions in Bangladesh. Truman and Baroudi's (1994) analysis indicated that women receive lower salaries than men even after controlling for job level, age, education, and work experience. These same factors constitute some of the causes of women's underrepresentation in the information-systems related occupations in the U.S.³ The data from UK show similar relationships. In 1991, British women accounted for only 10% of the

professional membership of the British Computer Society, 3% of the data processing managers, 20% of senior system analysts and 25% of programmers (Beech 1991).

Women are also underrepresented in national level decision making. As Table 4 indicates, women's proportion of seats in parliaments varies from 3.5% in Arab states to 21.2% in East Asia.

Table 4 about here

The differences in women's involvement in decision making may be both a cause and an effect of differences in terms of job preferences, educational specializations and Internet usage.

Influence of Culture on Attitudes toward Acquiring Technology-related Skills

Sociocultural factors influence the perceived benefits of acquiring technology-related skills. In general, women tend to face higher barriers than men in accessing education and training required to use ICTs (UNCTAD 2002). Moreover, such barriers vary widely across cultures. Consider, for instance, two countries at about the same level of economic development: India and Egypt. In India, it is easier for parents to find better husbands if their daughters are educated and hence they give emphasis to girls' education (Kumar 1991). Egyptians, on the other hand, do not give importance to women's education as men in Egypt seek less educated wives (Mianai 1981).

Availability of skills required to use a technology influences perceived ease of use and perceived usefulness of the technology and hence attitude towards its adoption. In case of Internet, for instance, a potential adopter must have computer and English language skills. In some cases the required skills may be learnt only for the purpose of using the technology,

³ 33.7% of system analysts and 34 % of programmers were women in the U.S. in 1991 (Truman and Baroudi 1994).

whereas in other cases they are learnt for some other (more general) purposes. For instance, it is unlikely that a potential adopter would learn English language and acquire computer skills solely for the purpose of using the Internet. Thus, additional perceived benefits of learning the skills influence the attitude toward learning them (Fishbein 1967) and hence adopting the technology. Because of job-related reasons, men in many countries may learn some English and this skill also incidentally helps in using the Internet.

Features Included in the Internet

It is not surprising that due to these sociocultural influences, the features included in the design of a technology tend to favor men rather than women. Features unappealing to women users are likely to exist for several reasons. First, women are highly underrepresented in administration, managerial, and technical types of jobs in most of the countries in the world. For instance, whereas the proportion of women administrators and managers in the U.S. is 44.4 %, women are virtually non-existent in such types of jobs in many of the countries (UNDP 2000). Such lack of top-level representation is compounded by manufacturers' unawareness of women's needs. Even when market research data are available, designers tend to ignore such evidence of actual needs – they rely instead on speculative ideal types/stereotypes of women users (Cockburn and Dilic 1994). Moyal (1992) argues:

It is the male engineer, technician, manager, strategic planner and policy-maker who have devised and installed the telegraph, the telephone, radio and television broadcasting stations, the communications satellite, and the advanced digital and mobile communication infrastructures and networks that link and continue to upgrade our spiraling telecommunication world.

In the case of the Internet, several technology-related factors tend to favor male users, including the following (Abernathy 1999; Biersdorfer 2001; Herring 1999; *Marketing to Women* 2001):

- Stereotyped views of female users (REF)
- Male-oriented aggressive formats of computer games
- Largely male-oriented online discussion groups, lacking elements of civility and online etiquette that women desire
- Prevalence of Internet pornography
- Low number of women in technology's power positions.

Features designed into a technology influence perceived usefulness and perceived ease of use (Davis 1989), the major predictors of the likelihood of the adoption of a technology. Lack of features that appeal to women means lower perceived usefulness and perceived ease of use for female users, leading to lower width and lower overall depth of Internet adoption among women. If more features that appeal to women are included, then women's likelihood of adoption as well as the width and the depth of adoption are likely to increase.

Attractiveness of Alternative Technologies

Cultural factors could influence the propensity to adopt a given technology in performing a certain function by making the "alternative technology" less or more attractive. For example, consider two relatively affluent Middle Eastern countries: Saudi Arabia and Kuwait. Whereas the proportion of female Internet users in the Arab states is estimated to be between 4% (Internet.com 2001) to 6% (Hafkin and Tagger 2001), the proportion is over 66% in Saudi Arabia (The Economist 1999; 2000) and over 50% in Kuwait (Wheeler 1998). The rapid increase in the number of female Internet users in Saudi Arabia is mainly driven by women's use of the Internet for business and personal reasons. In Muslim countries such as Saudi Arabia, women are not allowed to drive cars. Also, in Muslim societies, open and public interactions between men and women are highly constrained outside of marriage and family. Internet helps overcome such barriers. Wheeler (1998), for example, reported that several people in Kuwait had fallen in love and got married through the Internet Relay Chat (IRC) technology. Internet proved to be much

better than the existing alternatives for women in the Middle Eastern cultural settings, given the social norms against women driving cars and the restricted public intermingling of the two sexes.

Gender Related Factors

As social products, any technology including the Internet is not culturally neutral or value-free. The degree of compatibility between the values and norms of the technology and those of a potential adopter largely determine the adoption patterns of the technology (Rogers 1983). The “values” of most of the ICT products and services, including the Internet, tend to be more masculine than feminine, which partly explains the existing gender related digital divide (Herring 2000).

Men and women are also “specialized” for different tasks. In the U.S., for instance, “going shopping” has become associated with females while men “work” (Firat and Dholakia 1998). These specializations partly explain why women still assume major responsibility for shopping in the U.S. (Dholakia 1999) and why 70% of women make most of the household and purchase decisions (Hawfield and Lyons 1998). These gender related stereotype (shopping for women) continue to persist even among young adults (Dholakia and Chiang forthcoming). Such differences in specialization tend to result in gendered adoption patterns and gendered width and depth of applications of a given technology. As Internet applications have expanded to include roles and responsibilities that have traditionally fallen on women – including greater range of shopping and family communications – the proportion of women users on the Net has increased.

Attitude Towards Risk and Attitude Towards Technology

Men and women differ significantly in terms of attitude towards risk (Slovic 1966) and attitude towards technology in general (Brunner and Bennett 1998). Since so-called “innovators” of a new technology have more favorable attitudes toward risk (Gatignon and Robertson 1991),

women's risk-averse behavior is likely to result in lower rates of technology adoption. Men and women also differ in terms of their attitudes toward a technology. In an experiment with school children, Brunner and Bennett (1998) found that girls were more ambivalent about technologies than boys, were more likely to get bored with a bad technology experience, and were less likely to fix a technology if it breaks. Venkatesh and Morri (2000) reported gender differences in importance assigned to various factors for the adoption of ICT and Gefen and Straub (1997) reported gender differences in the perception and use of e-mail.

SUMMARY AND CONCLUSIONS

In summary, men and women have different “cultures”, are “specialized” in different tasks, and have different preferences. Such differences tend to interact with the features found in the Internet and other modern ICTs in ways that intensify their perceived usefulness and the perceived ease of use in favor of men rather than women. Table 5 summarizes the existing gender bias in Internet use in terms of several indicators.

Table 5 about here

Several limitations characterize the data used for the analysis and interpretation of gender differences in Internet use. First and foremost, our analysis has used a variety of sources, each of which has employed its own methodology of collecting, analyzing and reporting data. Next, the data uses sex and gender interchangeably such that it is difficult to capture sociocultural differences in the “meanings, roles, values, and status” assigned to the words “male” and “female”. Keeping these limitations in mind, the analysis presented in this chapter seems to support that:

- there is a gender gap measured by the proportion of male and female Internet users;
- this gap is decreasing, and has even reversed in overall terms in USA and Canada;
- when the gap is examined in terms of additional constructs (width and depth of adoption), differences in male-female uses of the Internet persist even in countries when the overall gap has reversed. RISQ analysis of Canada (figure 2) shows *time use differences*; and tables 2 and 3 show *application differences*.

Several factors contributing to gender bias in the adoption of the Internet have been discussed in this chapter. Drawing upon a general model of gender-technology-culture interaction, we first reviewed the sociocultural factors that contribute to the Internet being less compatible with the culture and values of women than those of men. Limited involvement of women in technology related decisions may be both a cause and effect of differences at several levels. With lower preference for disciplines that demand higher intensity of Internet use such as science, engineering, and technology, features included in the Internet and related technologies tend to favor men more than women. The two genders also differ in their attitudes towards acquiring required skills, and in valuing alternative technologies. These factors partly explain a lower rate of Internet adoption among women.

Second, we reviewed gender-related factors that influence men's and women's attitudes toward risk and attitudes toward technology in general. Greater risk aversion and a generally more unfavorable attitude towards technology-related problems tend to result in lower adoption rates among women. Since men and women differ in terms of their specializations, the *functional depth* corresponding to an application (e.g., shopping) tends to be different for the two genders. It is not surprising that men report greater purchases of technical products online and women purchase more apparel. When an application is consistent with gender specialization, such as a

woman's greater role in maintaining and enhancing the family's social interaction and communication patterns, then almost universal use by women can be expected – as is becoming evident to some extent with respect to email. Finally, the adoption of the Internet, like all other ICTs, is a function of the income level of the potential adopters. Women's lower per capita income and lower literacy rate partly explain the existing gender bias in terms of the adoption of the Internet.

Managerial and Policy Implications

It is likely that with the passage of time many of these gender differences would diminish. To the extent sociocultural and gender-related factors act as barriers to the design and use of technology such as Internet, these sources of gender bias can be tackled if appropriate measures are taken at various levels. Because men and women have different “cultures”, specialization, and preferences, the prevalent one-size-fits-both-genders approach is less likely to work in the design of a technology such as the Internet. Research is needed to understand women's needs in better ways and technology designers should be induced to incorporate features that meet such needs.

At the policy level, greater emphasis is needed on women's education – especially in science, engineering, technology, and administration fields. Women's representation in ICTs is strong in Singapore because of the government's “concerted” state directed ICT training -- 58% of analyst programmers and 52% of analyst designers in 1987 were women (Webster 1996). Women educated in such fields are likely to have the skills and propensity to adopt modern ICTs. Women's enrollments in such disciplines would have doubly greater social benefits since women trained in ICTs are likely to be the future designers and incorporate features that are

likely to favor women's adoption. But the emphasis must be accompanied by new ways of imparting the education (Shaffner 1993, p. 97):

The whole idea of sitting at a desk in an office and using a computer would have to change. It would have to be more like something that you could do in an environment where you could have children, babies, lovers, and community.

Policies are also needed to impart ICT skills to a broader group of women and enhance existing skills. These include ICT awareness programs, ICT-related training opportunities for women in workforce, and acquisitions of the right and sufficient ICT skills (UNCTAD 2002). Finally, the extent to which the gender-related digital divide could be bridged depends upon women's access to and involvement in technology-related decisions at the household, organizational, national, and international levels.

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Table 1: Gender Distribution of Internet Users Worldwide

Region/Country	Internet users Male: female ratio (2000)	GNP per capita (\$, 2001)	Source for column II
	II	III	IV
WESTERN EUROPE	58:42	22311	MMXI Europe
Denmark	64:36	31090	Nielsen/NetRatings
Germany	60:40	23700	Stewart 2002**
Ireland	60:40	23060	MMXI Europe
Italy	70:30	24340	MMXI Europe
Spain	56:44	20150	Nielsen Net Rating
Sweden	61:39	25400	MMXI Europe
UK	57:43	24460	MMXI Europe
USA	50:50	34870	Nua Internet Surveys
LATIN AMERICA	60:40	4896	E-Marketer
Argentina	57:43	6960	E-Marketer
Brazil	57:43	3060	E-Marketer
Mexico	58:42	5540	E-Marketer
ASIA	78:22	1925	LA Times, H & T (2001)
China	70:30	890	CNNIC (2001)
India	77:23	460	E-Marketer (2001), H & T (2001)
Japan	67:33	35990	ILO
Korea	58:42	9400	ZD Net
Singapore	57:43	24740	Nielsen//NetRatings
RUSSIA	81:19	1750	ILO
OCEANIA	54:46	19080	
Australia	55:45	25780	Nielsen//NetRatings
New Zealand	52:48	12380	Nielsen//NetRatings
MIDDLE EAST	94:6	4089	H & T (2001)

Notes:

- 1) H & T (2001) stands for Hafkins and Taggart (2001)
- 2) ILO stands for International Labor Organization.
- 3) GNP data (column III) are from UNDP (2000) and World Development Report 2003 (http://publications.worldbank.org/catalog/content-download?revision_id=1786747) and authors' calculation.
- 4) * Data from <http://www.acdi-cida.gc.ca/CIDAWEB/webcountry.nsf/vLUDocEn/47BC9ACB55E19B3785256A14006458D2>
- 5) ** Data for January 2002.

Table 2: Gender Difference in Usage of Leading Websites

	<i>US & Canada</i>		<i>Europe</i>		<i>Asia Pacific</i>		<i>Emerging Markets</i>	
	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>
Yahoo	49%	51%	64%	36%	57%	43%	64%	36%
Microsoft	53	47	69	31	61	39	68	32
Google	52	48	67	33	62	38	70	30
eBay	53	47	70	30	63	37	NA	NA
Amazon	44	56	63	37	61	39	62	38

Source: CyberAtlas “Men Still Dominate Worldwide Internet Use,” January 22, 2002

Table 3: Location of Internet Use in Rhode Island, USA

<i>Application Used</i>	<i>Male (n=80)</i>			<i>Female (n=56)</i>		
	None	At least in one location	Both locations	None	At least in one location	Both locations
Email	2.5%	17.7%	79.7%	0%	26.8%	73.2%
Online information services	3.8%	22.8%	73.4%	3.6%	23.2%	73.2%
Shopping	12.8%	48.7%	38.5%	20.4%	59.3%	18.5%

Source: Dholakia, Dholakia, Mundorf and Xiao 2002.

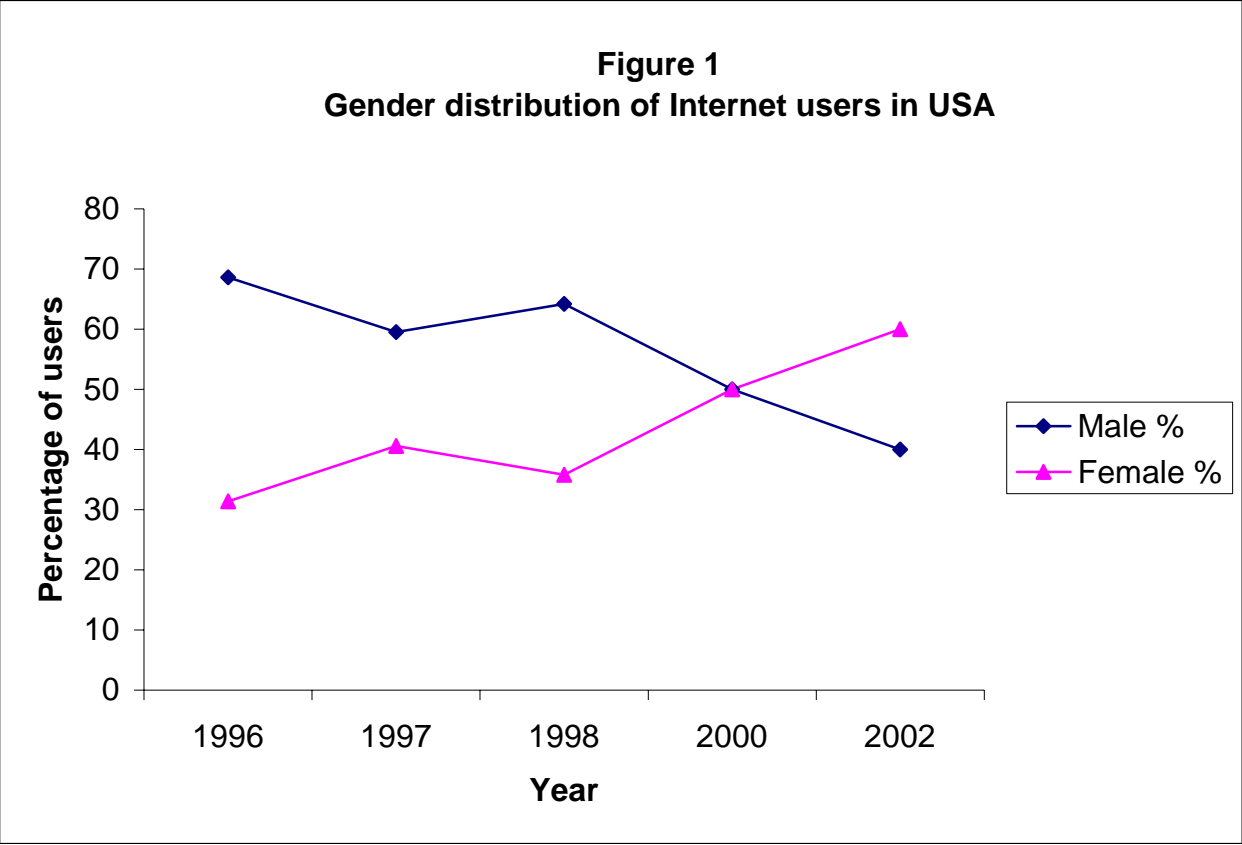
Table 4: Gender Related Indicators Influencing Internet use

Region	Gender related development index	Seats in parliament held by women (% of total)	Literacy rate (%)		GDP per capita (\$' 1998)	
			F	M	F	M
Arab states	0.612	3.5	47.3	71.5	1837	6341
East Asia	0.710	21.2	75.5	91.1	2788	4297
Latin America and Caribbean	0.748	12.9	86.7	88.7	364.	9428
South Asia	0.542	8.8	42.3	62.7	1147	3021
South East Asia and Pacific	0.688	12.7	85	92.4	2316	4154
Africa	0.459	11	51.6	68	1142	2079
Eastern Europe and CIS	0.774	8.4	98.2	99.1	4807	7726
OECD	0.889	15.1	96.7	98.2	14165	26743

Source: UNDP 2000, F: Female, M: Male

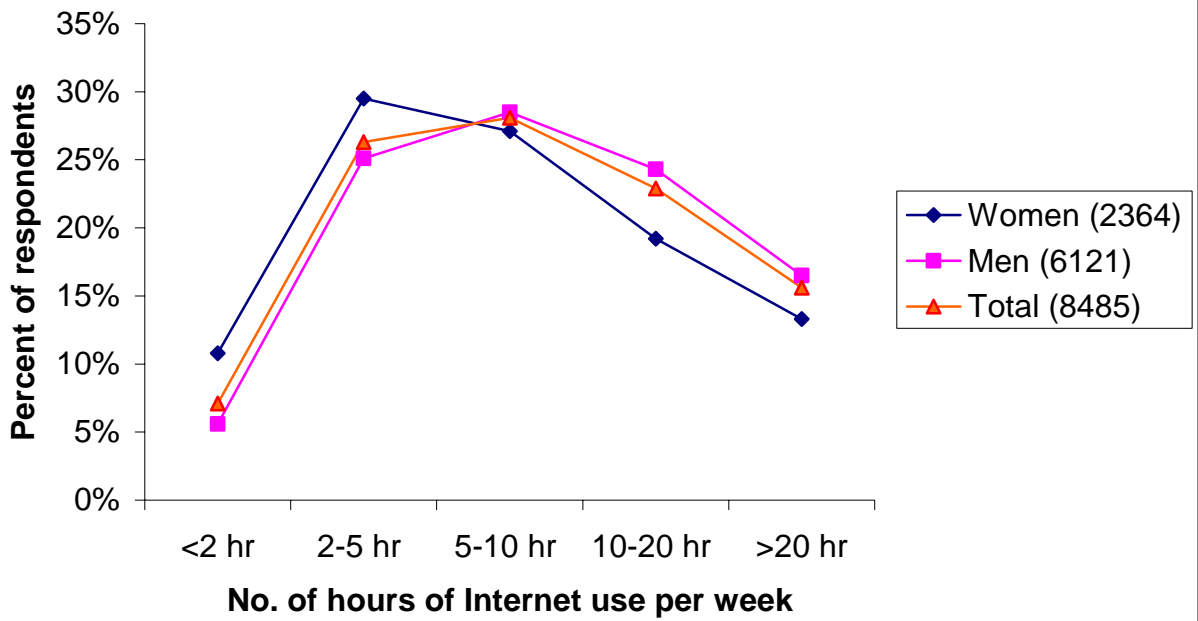
Table 5: Summary of the Nature of Gender Bias in Terms of Several Indicators

Indicator	Research Findings	Remarks
Proportion of female Internet users	<ul style="list-style-type: none"> • Lower than the proportion of male Internet users in most markets. • Tends to increase with the maturity of the Internet market. 	<ul style="list-style-type: none"> • Has reversed in the U.S. and Canada – female users outnumber male users in these countries.
Width of adoption	<ul style="list-style-type: none"> • Tends to be higher for men. 	<ul style="list-style-type: none"> • Men tend to use Internet for more applications than women.
Functional depth of adoption	<ul style="list-style-type: none"> • Depends upon the type of Internet application. 	<ul style="list-style-type: none"> • For instance, in the U.S., Internet adoption for visiting news and entertainment sites is deeper for women and that for visiting search engines and sports sites is deeper for men.
Overall depth of adoption	<ul style="list-style-type: none"> • Tends to be higher for men. 	<ul style="list-style-type: none"> • Men tend to spend more time online than women; and visit more pages.

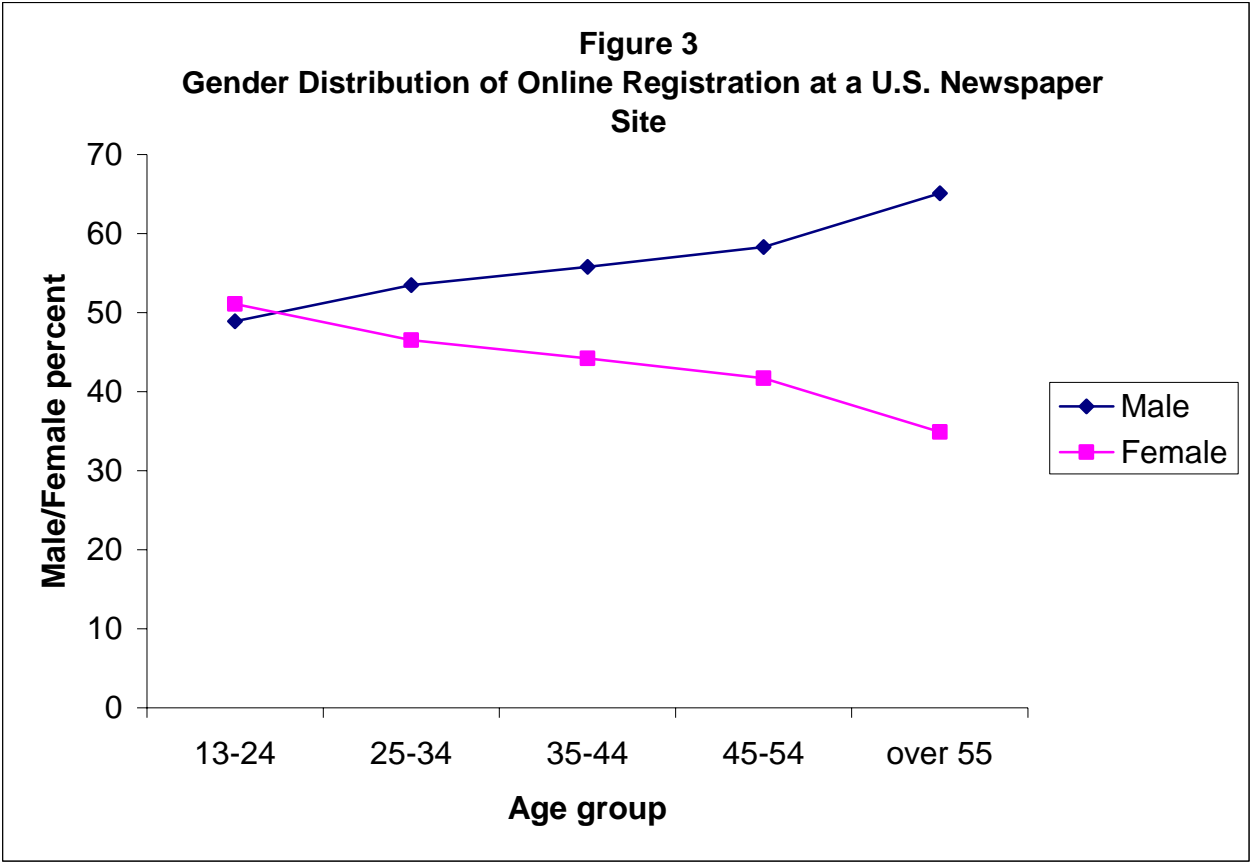


Sources: Nua Internet Surveys, GVU Center, and O’Leary (2000).

Figure 2
Gender and Internet Usage in Quebec, Canada (1997)



Source: http://www.risq.qc.ca/survey/4/Internet/int_heures.html



Source: *Private Communication with Ruby Roy Dholakia* Data as of September 13, 2002. Total registration: 78,123.

Figure 4: Gender-Culture-Technology Interaction

