

R^eTHINKING

THE INFORMATION HIGHWAY

Rethinking the Dual Digital Divide

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Executive Summary

Purpose of this study

This study analyses:

- the state of the “digital divide” in Canada as of the year 2000
- how the divide has changed since 1997
- why many Canadians remain unconnected to the Internet.

Importance of the Internet for Canadian society

The growth of the Internet has been phenomenal since it emerged a decade ago. It has evolved from a relatively unknown entity to a major communication medium used by approximately 60 per cent of Canadians.

The concept of the ‘digital divide’ needs to be expanded in meaning. The Internet and computer access and literacy are not ends in themselves. In an information-rich age, they are crucial tools linked with a broader set of capabilities that together are key constituents to help individuals participate successfully in technology-based social and economic activities. Technical proficiency, literacy and skills development can help people function in society and the workplace. These provide individuals and organizations with the flexibility to continually adapt to changes in work and society. The Internet and computers can also serve as the means for increased public participation.

Limited access to the Internet results in digital divides, among organizations as well as among individuals. Examining these divides leads inevitably to broader social questions about disparities in income, skills, educational levels and regional opportunities. These inequalities can prevent businesses, local governments, and community groups from implementing activities for individual and community social and economic development.

Addressing a more broadly conceived 'digital divide' means that, ideally, all individuals, social organizations, businesses, and communities in Canada should be capable of responding effectively to changes in our technologically oriented society, in order to be able to participate fully in economic and social activities. Understanding the social divide is the first step toward realizing this ideal.

Findings of the 2000 survey

This report examines responses to the survey question asking why respondents did not have access to the Internet from home. The analysis focused on three main barriers to usage: cost, perceived lack of need, and lack of interest.

Canada's Internet Digital Divide: Usage did not grow during 2000

- After strong growth in the mid 1990s, growth of Internet usage was flat throughout 2000.
- Access from home and elsewhere is showing signs of plateauing for all socio-economic levels.
 - While lower income Canadian households showed the fastest growth in this period (40 per cent overall connected from somewhere and 31 per cent from home), analysts expect this sub-group's access to plateau—particularly from home.
 - Any growth in specific sub-groups will probably be at a much slower pace than between 1997 and 2000.

Income has been the most important factor to determine the likelihood of Internet access.

- Education, location, gender and age are also important factors.
- By 2000, location (rural versus urban setting) was gaining in importance as a factor, with rural areas showing lower levels of access.
- The likelihood of home-based Internet access shows similar overall patterns:

- Income far outweighs age, gender, location and education as the most significant predictor of which households will have Internet access.
- Location increased in importance as a significant predictor in 2000 for home access.

Cost is still the most significant barrier to access, particularly in lower income households.

- As described in the *Dual Digital Divide* (PIAC, 2000), lack of interest and perceived lack of need are the other important factors for not having home access. Literacy is also an important factor.

Detailed sub-group analysis

Generational differences:

- Cost remains the most important barrier to access for youth (59 per cent in 2000).
- Cost concerns decrease with age.
- Technical literacy, perceived lack of need and lack of interest were the main barriers and disincentives to Internet access for seniors.

Gender:

- Cost is a greater barrier to women than to men for home Internet access.
- Men are more likely to identify lack of need as the main barrier to home access.

Educational level:

- There has been a shift among all educational levels in the reasons cited for not having Internet access at home.
- Since 1997, cost, lack of interest and lack of need have grown in significance as barriers to Internet access.
- For respondents as a whole, by 2000, the main barrier to access has shifted from lack of need to cost, but lack of interest and need are only somewhat less important barriers.

Type of job:

- The level of overall Internet access by type of job reveals a deep divide between professional, managerial and administrative employees on one side, and labourers and trade people on the other side.
- Workers in sales, service and clerical jobs are close to the mean on the level of overall access from somewhere.
- Home access is highly concentrated among professional, management and administrative workers ('white collar'), with all other categories ('blue collar') showing much lower rates of home usage.
- Overall, employment status (self-employed, employed full-time or unemployed) has little influence on whether a person is an Internet user (from somewhere).
- Not surprisingly, a majority of seasonal, term, or casual workers, as well as student and unemployed respondents cite cost as the main barrier to home Internet access.
- Among self-employed and full-time employed respondents without home Internet access, cost is the main barrier, followed by lack of interest, and then by lack of need.
- Full-time employees are the most likely Internet users, with the lowest levels of access among retirees and homemakers. Although not in an employment category, students are also highly likely to be Internet users.

Regional differences:

- At the regional level, there is a clear difference in usage between the "have" and the "have-not" provinces.
 - Ontario, British Columbia and Alberta are above the national average in terms of overall access.
 - The Maritime Provinces, Quebec and Saskatchewan exhibit lower levels of access.
 - In Saskatchewan, a slim majority of non-users are in the "near-user" category, whereas non-users in Quebec are more likely to be uninterested or perhaps to perceive language as a barrier.

- Cost tends to be the major reason for lack of home access in the “have-not” provinces, as well as among non-users in British Columbia.

Technical literacy and social capacity: Narrowing the Digital Divide

Eliminating the disparities in Internet access described in this report will require dealing with a broad range of factors, including:

- citizens’ economic and literacy capacities, as well as their interests and needs;
- the community’s technical resources and institutional supports and services;
- the community’s geographic, economic and social opportunities and limitations;
- conditions for individuals in the workplace (their employment status, type and requirements); and
- the nature and impact of change in the regional, national and international economic and social environment

A properly planned and resourced not-for-profit community organization can greatly contribute to overcoming technical illiteracy and affordability barriers.

- The gap between organizations with resources and skills and those without them (social infrastructure) is another dimension of the digital divide.

The improvement of a community’s capacity to use the Internet will have sustained benefits only if it goes hand-in-hand with technological infrastructure and substantive, ongoing training in general skills.

- Ongoing support and training helps individuals to develop their capacities by using the full potential of resources and services available.

- Developing a community's capacity also requires adequate long-term resources (funding, staff, equipment, expertise, etc.) for community organizations providing services.
- There must also be specific training programs for individuals in such areas as technical access, Internet, standard literacy, and employment skills.
- Over time, such multi-level support will enable the individuals who use and benefit from the services in turn to contribute to their community's economic and social well-being.

Community-based, not-for-profit Internet access and training services can significantly increase the usage rates by the social sub-groups traditionally found to have low or lagging technology adoption rates in Canada.

- One case study of a low-income neighborhood showed a level of interest in and use of the Internet that was higher than the national average for those facing affordability and literacy barriers.

Communities can facilitate access by taking advantage of an established community organization that is already familiar to residents.

- Recent research demonstrates that this approach has helped draw many “near users” online.

Technical literacy in a global context

While Canada is among the leaders in addressing the digital divide problem, gaps remain. But solutions may lie in innovative approaches tried elsewhere. A key lesson learned from programs in other countries is that the most effective initiatives are guided by local needs and interests.

Compared with other countries, Canada and the United States are better placed to foster increased Internet access and use.

- While Canada faces the same challenges as other countries in generating Internet usage (access, literacy skills, employment

opportunities, etc.), we, like the United States, have many advantages.

- Canada has an established base of physical, economic and social infrastructure.
- Canada has better technical and financial resources than most countries.

Conversely, Canada also shares some of the same weaknesses.

- There are acknowledged weakness in social infrastructure in communities and social literacy for individuals.
 - Overcoming these weaknesses can help overcome economic and social divides.
 - Improved strength in areas such as education, literacy, and employment and skills training can help Canadians participate more fully in social affairs.

Recommendations

Digital Divide Concept:

- The concept of the digital divide needs to be broadened to more appropriately incorporate the importance of the integration of information and communication technologies (ICT) with other skills and activities in people's daily lives.

Diversity of Access:

- To meet the needs of all Canadians, both those connected and unconnected, information and services must be available through a range of means (e.g., paper, in-person, Internet, telephone) and must be of comparable quality.

Public Awareness:

- The federal government should work with community organizations to increase awareness by non-users of the availability of local access sites, and the services available.

Publicly Relevant Content:

- There is an important need to create more Canadian content, particularly at the local level (e.g., citizenship, social, cultural).
- The various levels of government should provide funding and other support for individuals and not-for-profit organizations to create social, cultural and citizenship content for general access and use in communities.

Benchmarking Modern Technologies in the Home:

- The national census conducted by Statistics Canada should include questions on home telephone, cable television, computer and Internet access.

Sustainability of Public Access Sites:

- Ongoing support, particularly sustainability funding, is required for Community Access Program (CAP) sites in Canada.
- Future CAP funding by Industry Canada should include: (a) required national service standards and (b) a review of the geographical location of sites to ensure they are suitably located to meet local needs.
- Industry Canada should explore the viability of establishing provincial level not-for-profit Community Development Foundations. Administered by community representatives, these foundations would disseminate federal sustainability funding and other forms of support.
- Business should be engaged to do more to support access initiatives in Canada.

HRDC Roles for Individual and Community Capacity Development:

- HRDC should take a lead role through its Skills and Learning Agenda to address the digital divide as it is broadly conceived.
- HRDC's Community Learning Network program should be extended and used as a key resource in the Skills and Learning Agenda.
- The Community Learning Network program should consider establishing Community Assistance Teams to help community organizations with issues relating to establishing a CLN, access, training, partnerships, capacity development and resources.

- Funding support from HRDC should include resources that permit communities to undertake community-level and individual needs assessments.
- There is a need for ongoing federal financial support, separate from the CAP and CLN programs, for community organizations that provide access, skills, training, content development and related services to the public.

Other Possible Federal Government Roles:

- Strategies and initiatives by the federal government and community organizations to close the various “divides” should include measurable goals and objectives.
- There are roles for Ministers in the federal government as part of a communication strategy to help create better public awareness about the importance and relevancy of lifelong learning, literacy, skills upgrading and ICT skills for individual betterment and participation in the changing economy, as well as for community and regional development. Coordination between federal departments may enhance such initiatives.
- The federal government and the Canadian Radio-television and Telecommunications Commission should consider the viability for such initiatives as:
 - a regulatory fund (*Telecommunications Act*) to address basic telephone affordability;
 - a fund (*Telecommunications Act*) comparable to the U.S. E-Rate program to provide connectivity funding assistance to community-based not-for-profit organizations providing access and training;
 - regulation-based public benefits contributions arising from mergers and take-overs for community-based not-for-profit efforts to address the digital divide, non-commercial content development, and community capacity development;
 - regulation-based contributions by Internet service providers, and companies regulated under the *Broadcasting Act* for community-based not-for-profit efforts to address the digital divide, non-commercial content development, and community capacity development.

1.0

Introduction

The purposes of this study were to analyze the state of the digital divide in the year 2000; analyze how this had changed over the previous three years, 1997 to 2000; and better understand why some Canadians remain unconnected. The study focuses primarily on the state of the digital divide in Canada in 2000. This analysis considers which variables or circumstances, such as employment type, gender, age and income, help to better inform our understanding of the subgroups of the unconnected population.¹

The study also investigates differences between Internet users and non-users through a comparison of selected technical literacy skills and activities, and evaluates the importance of content and social context in relation to individuals benefiting from access to the Internet. The study also includes a general overview of efforts in other jurisdictions to close the digital divide. This report concludes with a number of policy and program recommendations.

Previous work in this area not only identified a general digital divide, between the Internet 'have' and 'have nots', but further divided the unconnected into 'near users' and 'far users'. Near users are those individuals who are interested in using the Internet but fail to do so because of some structural obstacle, such as cost or literacy. Far users, on the other hand, have little interest or need in using the Internet, though some will likely be occasional users in the near future.²

This research also found preliminary signs that access to the Internet was levelling off for upper middle and upper income households, but that some growth, albeit slow, continued among the lower income household segments.

¹ The views expressed in this report are those of the authors and not necessarily those of Ekos Research Associates Inc.

² EKOS Research Associates Inc., 2000, *Rethinking the Information Highway*; PIAC, 2000, *The Dual Digital Divide*.

By 2000, other digital divides had been identified and were gaining currency in policy discussions. These include divides between connected and unconnected businesses; between the developed and developing nations; between those using narrow band and broad band; and divides based on demographics such as gender and age, among others. This study is mainly concerned with access to, and the ability to use, basic computer technology and the Internet, but contextualizes this analysis to some degree within some of the emerging broader divides.

Attention to the Internet divide has been somewhat overrepresented in debates about Canada as an information society. Internet and computer access and competency are key constituents of successful participation in technology-based social and economic activities. However, these are building blocks linked to a broader complexity of just as important, if not more important, capabilities. Individuals need to be literate on several levels, including numeracy, prose, interpersonal communications, and have different levels of technical proficiency in order to function in society and the workplace and have the flexibility to continually adapt to changes in work and society. The Internet and computers have joined a widely diverse basket of supportive resources that facilitate these developments (including ongoing learning), and help maintain participation.

In this broader view, the digital divide encompasses the ability of individuals, social organizations, businesses and communities to effectively respond to changes in an 'information society' and participate successfully. Digital divides, involving individuals as well as organizations, necessarily raise the question of inequalities relating to income, skills, education in the broadest sense, geography and region, and information and communication technologies. Digital divide inequalities also concern the capacity of community groups and organizations, businesses, and local government to implement activities for individuals and community-wide social and economic development.

Another interesting development in 2000 was the shake-out of the dot com's and the shift of the Internet to a somewhat higher level of maturity in its structure and operation. The shake-out of the 'wild west' and 'gold rush' dimensions of the Net, and the early signs of market normalization or maturity, particularly in the area of e-commerce, suggests that the Internet is being formed and is developing into structural and operational norms comparable to those found with traditional products and services.

At the same time, it is maintaining many of the innovative benefits for institutional and individual communication, such as distributed access and production, individual transactions, etc.

More than two thirds of Canadians report that the Internet has become universally available to them. At the same time, questions about affordability, sufficient capacity, value and relevancy remain outstanding for many individuals, neighbourhoods and communities. However, while the Internet has the potential to be used to achieve many progressive social and economic objectives, the realization of these objectives depends on the successful interventions by the full range of interests (individuals, government, communities, business, social organizations) as part of decision-making in the design of access and content services.

This study is primarily concerned with issues of access at the level of the individual and the household. Other research complements the analysis of this study and helps form the broader context for understanding the development, use and benefits or drawbacks of the Internet in Canada.³

³ See for example, EKOS Research Associates Inc. *Rethinking the Information Highway* studies; Statistics Canada studies and reports on the Internet and other communication technologies; and for work on community level access, V. Rideout, "Public Access to the Internet and the Canadian Digital Divide", forthcoming, 2001.

2.0

Methodology

This study was based on statistical research and literature from Canada and other countries. Statistical research in Canada included ongoing studies by EKOS Research Associates Inc. Books, articles, documents and reports from government, industry, academia and other sources were also used. Most of the analysis in this report is based on EKOS Research's ongoing *Information Highway and Canadian Communication Household* studies (1997 – 2000).

The EKOS 2000 study, *Rethinking the Information Highway*, consisted of a telephone poll (5,008 respondents) and a follow-up mail-out survey to a panel of 1,973 respondents drawn from the previous sample. To facilitate tracking and analysis, results from the EKOS 1999 Information Highway study were also included in this analysis (5,014 telephone poll respondents; 1,829 mail-out survey respondents).

3.0

Tracking the Dual Digital Divide

The most vital information for understanding how the Internet may evolve comes from some of the most basic findings on Internet usage — the numbers of users and non-users, who they are and why some have not been using the Internet. It is crucial to have a clear understanding of these trends before venturing into more specific details of how Canadians use the Internet.

The first iteration of the dual digital divide in 2000 found that “off-line” Canadians (non-users) were segmented in two main types: near and far users. Near users showed interest in on-line service, but they faced obstacles and barriers such as cost and technical literacy. Far users faced cost and technical literacy obstacles as well, but other important factors were also in play. These additional factors included the lack of relevant content and the perceived lack of personal benefit and social value of Internet service.

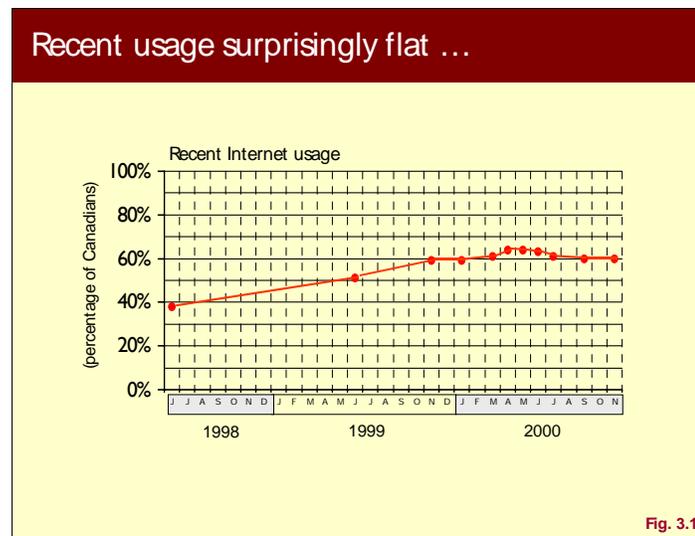
This chapter gives an update of this segmentation and focuses on key barriers to Internet access. Before looking at how the near and far users evolved over the last few years, we will look at the recent growth of Internet access and its underlying demographic patterns. We will also shed light on the historical gap in Internet access that separates youth and seniors, low- and high-income citizens, and women and men.

Overall Access

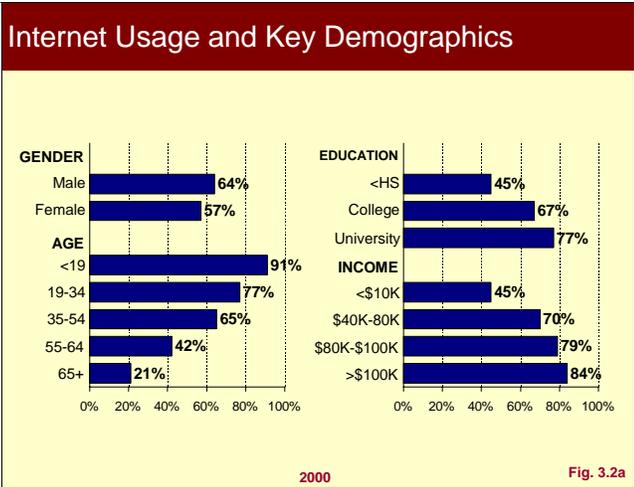
It is now a truism to say that the market penetration rate of the Internet has been phenomenal since its emergence in the early 1990s. Our research shows that only a slim minority of Canadians knew what Internet was at the beginning of the past decade. Eleven years later, almost all Canadians are familiar with the term and approximately 60 per cent are considered on-line users (39 per cent in 1998 and 51 per cent in 1999) according to our definition.

An Internet user is defined as someone who has had access to the Internet in the past three months. The points of access recognize a number of locations and modes including, but not limited to, in the home, at work, at school, and at a public access point.

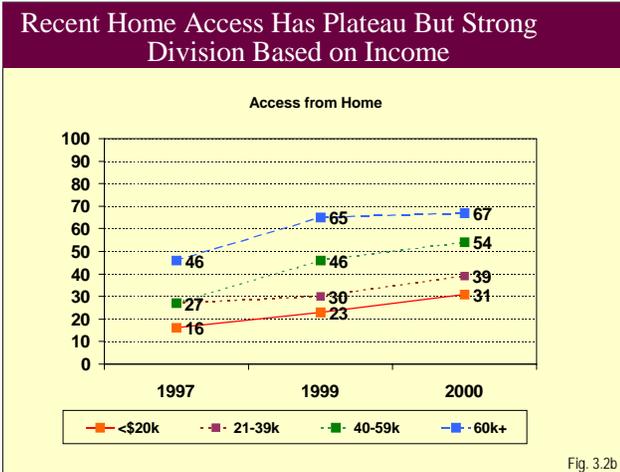
Despite strong growth in the mid-1990s, the latest figures reveal that growth in recent Internet usage was flat throughout 2000 — it was at 59 per cent in January and increased to 60 per cent by November [Figure 3.1]. Usage peaked in April and May (64 per cent during both months), but dropped back down to 61 per cent by July and 60 per cent by September. The strong growth seen in previous years has abated, revealing a relatively flat growth rate over the last year.



Top-line analysis of the data from the 2000 *Rethinking the Information Highway* telephone poll reveals an overall picture of Internet usage that highlights some of the key demographic differences (Figure 3.2a). Internet usage, according to our definition increases with education and household income, declines in older age cohorts, and is significantly more prevalent among men (64 per cent) than women (57 per cent).



Similarly, Internet access at home has been relatively stable throughout 2000. More revealing is the strong home access division that is maintained according to household income. Figure 3.2b shows that in 1997, a 30-point gap separated respondents from the lower to the higher income category, compared with 36 in 2000.



Non-Users and Access Barriers

Table 3.1 tracks the main barriers to Internet access from home identified in the 1997, 1999 and 2000 *Rethinking the Information Highway* telephone survey. This question was addressed to respondents who did not have access to the Internet from home. A majority of these respondents were also defined as non-users, as they had not had access to the Internet in the last three months, either at work, at school or from a public access point.⁴

The proportion of respondents who identify lack of interest as the main reason they do not have access from home has remained steady over the last three iterations of the survey (approximately 30 per cent). The significant shift from 1997 to 1999 in the proportions of Canadians who identify cost vs. need as the main barrier (wide swing towards cost in 1999) retreated somewhat in 2000. Cost remains the most significant barrier to home access in 2000, as indicated by a plurality (38 per cent) of respondents. The shift from need to cost may be a reflection of the substantial increase in the number of Internet users during that time period (strong growth rate among Internet users from 1997 to 1999).

⁴ Methodological note: The survey item “What is the main reason why you do not have access to the Internet from home?” is an open-ended question. In other words, respondents were not asked to select which answer is closest to their opinion or most accurately reflects their situation. Open-ended questions are coded post-facto, where the answers provided by respondents are classified into broader (inclusive) categories. When we say that the respondent identified “cost” as the main barrier, the response may have included answers such as “too expensive” or “cannot afford it”. The three main barriers, cost, need and interest, capture *most* of the answer categories offered by respondents to this survey item. The percentages represent the frequency of responses among these three barriers, and not the overall (gross) frequency of responses. The same methodology was applied to the 1997, 1999, and 2000 survey data.

**Table 3.1
NEAR and FAR users
Main Reasons Why No Internet Access From Home**

	Cost	Interest	Need	n
Overall				
1997	27%	30%	43%	1,730
1999	42%	33%	25%	858
2000	38%	30%	32%	1,488
Non-Internet users				
1997	23%	32%	45%	1,449
1999	37%	38%	25%	680
2000	32%	36%	33%	1,150
Internet users				
1997	50%	20%	30%	281
1999	60%	12%	28%	178
2000	60%	11%	29%	338

Table 3.2 shows that cost remains the most important barrier to Internet access for youth, increasing from 51 per cent in 1997 to 56 per cent in 1999, rising further to 59 per cent in 2000. It is worthwhile mentioning that cost concerns decrease substantially with age. Among the pre-retirement and the retired cohorts, significantly fewer people identify cost as a barrier to access. This trend has been stable over the last three years.

While cost is less of a concern among older Canadians (less than one out of five identify it as the most important barrier in 2000), technical literacy and perceived need remain strong disincentives and barriers to Internet access, which has remained virtually unchanged for this group since 1997. Overall, the survey results indicate that in 2000 seniors are more likely to identify “interest” rather than “need” as a barrier to access. These most recent results show a remarkable shift since 1997, when “need” outnumbered “interest” by a margin of 16 percentage points for seniors.

Table 3.2
NEAR and FAR users
Main Reasons for the Lack of Internet Access from
Home

YOUTH	Cost	Interest	Need
1997			
<25	51%	24%	26%
25-34	40%	23%	37%
35-44	38%	24%	38%
45-54	28%	33%	39%
55-64	32%	32%	49%
65+	8%	38%	54%
Total	28%	30%	43%
1999			
<25	56%	21%	23%
25-34	42%	31%	27%
35-44	50%	29%	22%
45-54	43%	32%	25%
55-64	32%	39%	30%
65+	19%	53%	28%
Total	42%	33%	25%
2000			
<25	59%	15%	26%
25-34	58%	19%	23%
35-44	50%	22%	28%
45-54	41%	27%	32%
55-64	26%	39%	36%
65+	19%	42%	39%
Total	38%	30%	32%

Table 3.3 shows that cost remains a more salient barrier for women with 39 per cent (36 per cent for men), and is the main reason for this group not having access to the Internet from home. This minor yet significant gap persists from earlier soundings in 1997 and 1999. Conversely, a larger proportion of men (compared with women with no home Internet access) identify lack of need as the main barrier to accessing the Internet in the 1997, 1999 and 2000 surveys.

Table 3.3
NEAR and FAR users
Main Reasons for the Lack of Internet Access from Home

SEX	Cost	Interest	Need
1997			
Men	27%	29%	45%
Women	28%	31%	42%
Total	27%	30%	43%
1999			
Men	39%	32%	29%
Women	45%	33%	22%
Total	42%	33%	25%
2000			
Men	36%	31%	33%
Women	39%	29%	31%
Total	38%	30%	32%

Table 3.4 looks at the main barriers to Internet access at home by education levels. Overall, the order and magnitude of importance of these three main barriers has changed since 1997.

Table 3.4 NEAR and FAR users Main Reasons for the lack of Internet Access from Home			
EDUCATION	Cost	Interest	Need
1997			
LSHS	27%	30%	43%
COLL	29%	30%	41%
UNI	28%	28%	44%
Total	27%	30%	43%
1999			
LSHS	41%	37%	22%
COLL	46%	33%	21%
UNI	41%	25%	34%
Total	42%	33%	25%
2000			
LSHS	35%	35%	30%
COLL	43%	25%	32%
UNI	43%	20%	37%
Total	38%	30%	32%

In 1997, a plurality of respondents, regardless of education levels, indicated that the lack of need was the main reason for not having Internet access from home. By 1999, among respondents from all educational levels, there was a shift towards cost as the main barrier to the lack of Internet access at home. Respondents with a university degree were a little more likely to cite lack of need as the second most important barrier. Canadians with a college or high school level of education were more likely to indicate lack of interest in home access to the Internet as the second most important barrier.

A similar trend continues into 2000, with cost losing a little importance, notably among Canadians with lower levels of education. Respondents with, at most, a high school level of education are evenly split between cost and the lack of interest in home access to the Internet as the main

barriers. These results set them apart from respondents with higher levels of education, whom we more easily classify as “near users” because cost continues to be the biggest obstacle for them.

Table 3.5 displays the main barriers to home Internet access by income categories, tracking results from 1997, 1999 and 2000. It comes as no surprise that cost as a main barrier is linked to income, especially among respondents with household incomes under \$20,000 per year. This is most noteworthy in 1997 and 1999, when the overall shift towards cost was uncovered among the population as a whole. By 2000, the more extreme differences and polarization by income levels seem to have attenuated to a great extent. While cost is still the most important factor among respondents with low household incomes, the overall patterns of response are more homogenous between income categories in the 2000 survey of Canadians.

**Table 3.5
NEAR and FAR users
Main Reasons for the Lack of Internet Access from
Home**

INCOME	Cost	Interest	Need
1997			
<\$20K	35%	20%	46%
\$20-39K	28%	32%	39%
\$40-59K	28%	25%	47%
\$60-79K	23%	36%	41%
\$80K+	26%	32%	42%
Total	27%	30%	43%
1999			
<\$20K	56%	27%	17%
\$20-39K	41%	33%	26%
\$40-59K	49%	30%	21%
\$60-79K	39%	37%	25%
\$80K+	27%	33%	40%
Total	42%	33%	25%
2000			
<\$20K	45%	28%	26%
\$20-39K	38%	33%	29%
\$40-59K	39%	26%	34%
\$60-79K	41%	34%	26%
\$80K+	38%	26%	37%
Total	38%	30%	32%

Another interesting result to note is the large proportion of respondents in higher income categories (>\$80,000) who cite lack of need as the main reason they did not have Internet access from home in 1999 and, to a lesser degree, in 2000. These responses may be capturing a segment of the population that has access to the Internet elsewhere (likely in the workplace) and therefore do not think they need Internet access from home (40 per cent among those with high household incomes mention lack of need in 1999).

4.0

Detailed Sub-Group Analysis

The previous chapter concentrated on the principal reasons why Canadians did not have access to the Internet at home. In this section, we use key demographic characteristics of Internet users and non-users to highlight where the differences and similarities between each group lie.

Multivariate Regression Analysis

Because there are both an overlap in demographic characteristics and strong currents that cut across a number of lines (for example, youth, regardless of income, are more apt to be Internet users), a regression analysis to examine the likelihood of being an Internet user and/or having access at home is the next reasonable step in the analysis of the digital divide.

A logistic regression analysis examines the extent to which changes in independent variables increase or decrease the likelihood of an event. The “event” in this case is having access to the Internet in the past three months or having access to the Internet at home.

Regression Model with Key Demographic Variables

Testing the likelihood of recent and home Internet access by key demographic variables, we find that education, age, household income, gender and, to some extent, geography are all significant factors in determining the level of access. For data points in 1999 and 2000, an increase in education and household income levels are both positively linked to increased likelihood of Internet use. Higher Internet use and access levels are positively correlated with younger Canadians and men, as well as Canadians living in urban areas. In the 1999 survey, however, the urban-rural variable proved to be a non-significant factor in determining the level of home Internet access assuming all other demographic variables were held at a constant value.

In other words, income and education, even when the generational and gender gaps are accounted for, contribute to a very great extent to the

differences in the levels of access to the later Net in Canada. These results are stable across the 1999 and 2000 survey results, with only a slight shift in the geographic variable. The urban-rural setting gains in importance, in 2000, although its direction remains relatively stable compared with 1999. Overall, perhaps the most important factor in predicting the likelihood of having access from home is household income. In both 1999 and 2000, this variable far outweighs education, gender and age, emerging as the most significant predictor of household access to the Internet.

Regression model with employment status

We wanted to see if employment status, given other demographic characteristics, is a significant contributor to whether or not Canadians have had recent access to the Internet or Internet access from home. Detailed results and tables are found in Appendix A.

Among unemployed Canadians, the trend is generally towards a negative correlation with Internet access, (less likely to have Internet access), although the wide variation in the data leads to inconclusive results. Nonetheless, in the 2000 survey the negative correlation between unemployed Canadians and Internet access in the past three months is significant.

When we maintain other demographic characteristics, including education, age, income, gender and location, part-time employment has no significant relationship to recent Internet access or Internet access from home.

Although full-time employment has no significant effect on Internet access over the past three months, it appears to have a negative effect on Internet access from home. These results may seem puzzling at first, but they are readily explained when we look at the effects of being self-employed on home Internet access. Each employment category is coded as a dichotomous variable (either the respondent is employed full-time or not). In fact, it is because these categories are mutually exclusive that a number of concurrent models were examined, each one analyzing the effect of a particular employment status.

We see that Internet access from home in the 2000 survey is positively correlated with respondents who indicate they are self-employed. This would mean that the composite of all other categories would be negatively correlated, including respondents who are employed on full-time basis.

The bottom line on employment status is that for the most part, when combined with the effects from other key demographic characteristics, it

has little influence either way on the odds of being an Internet user. The results from the 2000 survey indicate that, when other key demographic characteristics are accounted for, the likelihood of having access from home increases among respondents who are self-employed.

Level of access and employment status

The logistic regression analysis that examines the likelihood of having had recent Internet access or access to the Internet at home provides valuable information about the contribution of the demographic characteristics to the changes in the level of access. However, the complex analysis that incorporates age, gender, education, income level, location and employment status may be a little overwhelming and at times confusing. For instance, the results illustrating that full-time employment status has a negative effect on the probability of access from home is somewhat counter-intuitive, especially when we do not offset these results with the combined effect of age and income.

In fact, we know that respondents who are employed full-time have an above average level of access to the Internet. In order to restore a baseline on the level of access, we propose a more direct profile by employment status. The differences in employment status are highlighted in Table 4.1, where we also examine the variations in the types of non-users and the main reasons why respondents do not have access to the Internet from home.

In 1999, the employment groups with the highest levels of access to the Internet were 1) students, 2) full-time employed, 3) term or casual employed, 4) self employed and 5) part-time employed. Those who are in the seasonal-employed category also have above average access levels. Respondents who are unemployed are split, with approximately one in two indicating recent Internet access. The level of overall Internet access declines significantly among respondents who describe their current employment status as homemakers, retired or other (including those on maternity or disability leave).

The wide divergence in the overall level of Internet access by employment status reflects the generational effect outlined in previous sections. With more than three in four students indicating they have had recent access to the Internet, this represents a 56-point gap with retirees.

Access to the Internet from home does not present divergences between employment types quite to the same extent. The levels of home access range from just over one in two (55 per cent) among students to a low of one in five (20 per cent) among retirees. Compared with other employment groups, the self-employed and full-time employed have slightly higher levels of home access to the Internet, with part-time, seasonal and term employees closer to the average. Respondents who are unemployed and homemakers have significantly lower levels of home access.

Respondents who do not have access to the Internet at home were asked to identify the main reason why they do not have home access. The results show a split between three main reasons: cost (42 per cent), a lack of interest (33 per cent), and a lack of need (25 per cent).

However, these results are far from equivalent along demographic lines (as outlined in Chapter Three on the types of non-users). The major factors contributing to not having access to the Internet at home also vary widely depending on employment status.

A majority of respondents who could be described as more precariously employed (seasonal, term, casual, students) or unemployed cite cost as the main barrier to home Internet access (72 per cent among unemployed and approximately two out of three among seasonal, term, casual and students).

**TABLE 4.1
EMPLOYMENT TYPE and Level of Access**

		Used the Internet		Main reasons why no Internet access from home		
		In past 3 months	At home	Cost	Interest	Need
N						
1999						
Self-employed	566	58%	52%	40%	34%	26%
Full-time	1992	61%	45%	38%	34%	28%
Part-time	475	54%	41%	48%	24%	28%
Seasonal	109	55%	41%	68%	18%	14%
Term/casual	67	61%	43%	67%	17%	17%
Unemployed	247	48%	32%	72%	18%	11%
Student	302	76%	55%	64%	15%	21%
Retired	942	20%	20%	22%	50%	28%
Homemaker	202	33%	30%	48%	30%	23%
Other	86	34%	29%	56%	38%	6%
Total	4988	51%	40%	42%	33%	25%
2000						
Self-employed	574	65%	64%	32%	33%	35%
Full-time	1951	73%	58%	45%	24%	31%
Part-time	495	69%	58%	53%	21%	25%
Seasonal	89	44%	42%	59%	16%	25%
Term/casual	47	67%	64%	80%	20%	0%
Unemployed	141	52%	43%	47%	22%	31%
Student	410	89%	71%	75%	10%	15%
Retired	947	25%	26%	19%	41%	39%
Homemaker	249	35%	34%	40%	34%	26%
Other	86	44%	37%	54%	29%	18%
Total	4989	60%	51%	36%	27%	36%

Among part-time workers and homemakers, a near-majority cite cost as the major barrier to home Internet access, with the balance of homemakers slightly more inclined to say that they are not interested in having Internet access from home.

Self-employed and full-time employed who do not have Internet access from home are split on all three main reasons. A plurality cite cost as the major barrier, with a further one in three who say that they have no

interest. The balance — just over one in four — say they do not need Internet access at home.

Only among retirees do we find that a majority of respondents who do not have Internet access from home say that it is because they have no interest (50 per cent). The remaining retirees are split between the lack of need (28 per cent) and the cost (22 per cent).

The results from the 2000 survey show very similar patterns emerging. Although the levels of access have increased, both overall (60 per cent) and from home (51 per cent), the rate at which they increased is very similar from one employment group to the next. Students and full-time workers are still among the most likely Internet users, with the lowest levels of access found among retirees and homemakers. The 2000 data on Internet access from home reveal similar findings to 1999.

The sizeable (11-point) increase from 1999 to 2000 in the proportion of respondents who indicate they currently have Internet access from home has had a noticeable effect on the main reasons for no home access. That is, those who do not have home access are less likely to cite cost as the main barrier in 2000 compared with 1999.

There is a similar pattern in the overall responses in 1999 and in 2000. Cost is still the main barrier among respondents who are seasonal, term, casual or students. The most striking difference is the reduction in the number of unemployed respondents who say cost is the main barrier. While still a plurality at 47 per cent in 2000, it is nowhere near the 72 per cent who indicated cost as the main barrier in the 1999 survey.

Level of access and employment type

We asked Canadians who are currently or were recently employed to identify which job category best describes their most current or recent employment. The results were tabulated along six major job types: labourer; semi-skilled; skilled trades person; sales, service, and clerical; professional; and management and administrative. For both 1999 and 2000, we looked at the level of access to the Internet, access to the Internet from home and the main barriers to home access among the six distinct employment types (Table 4.2).

The level of overall Internet access by employment types reveals a deep divide between profession, managerial and administrative on one side (“white collar” workers), and labourers and trade people on the other (“blue collar” workers). Respondents who work in sales, services or clerical types of employment figure close to the mean on the level of overall access to the Internet. Home access, on the other hand, is more highly concentrated among the previously identified white collar workers, with all other employment types falling well below the home access rates among professional, management and administrative workers.

TABLE 4.2
TYPE OF EMPLOYMENT: Level of Access

	n	Used the Internet		Main reasons why no Internet access from home		
		In past 3 months	At home	Cost	Interest	Need
1999						
Labourer	440	40%	32%	53%	25%	22%
Semi-skilled	323	42%	31%	47%	33%	21%
Skilled trades person	628	41%	33%	37%	40%	23%
Sales, service, clerical	1094	45%	34%	47%	31%	21%
Professional	1265	64%	50%	39%	31%	31%
Management or administrative	759	60%	48%	32%	34%	34%
Total	4509	51%	40%	42%	33%	25%
2000						
Labourer	442	48%	40%	42%	31%	27%
Semi-skilled	302	50%	40%	38%	33%	29%
Skilled trades person	607	53%	49%	36%	33%	32%
Sales, service, clerical	1101	58%	48%	40%	32%	28%
Professional	1237	70%	60%	37%	22%	40%
Management or administrative	716	71%	59%	36%	27%	36%
Total	4405	60%	51%	38%	30%	32%

Level of access and regional differences

While the most striking difference in the level of access to the Internet has been expressed in terms of generational gaps, a number of economic conditions, including income and employment status, also determine the extent to which Canadians have access to the Internet, either at home or elsewhere. These divergences can also be expressed in geographic terms, noting that have and have-not provinces present evidence of different levels of access to the Internet.

The results from the 1999 survey are presented in Table 4.3. The highest levels of access are recorded in Alberta, Ontario and British Columbia (56 per cent overall). In Quebec and in New Brunswick, the rate of access is significantly lower (40 per cent). All other regions hover near the average rate (51 per cent).

Access from home, at 40 per cent overall, is significantly higher among respondents from Ontario (46 per cent) and British Columbia (44 per cent). Internet access from home falls to 30 per cent in Saskatchewan and 29 per cent in Quebec. The major difference in these two provinces with lower home access is in the types of non-users. In Saskatchewan, a slim majority (52 per cent) of non-users are what we have called near-users (cost the major barrier). In Quebec, on the other hand, while cost is still the most important factor, it is not cited to the same extent (42 per cent). This is the same as the national average. In Quebec, a relatively higher proportion of respondents say they do not have Internet access from home because of lack of interest (36 per cent). This is perhaps a result of the apparent language barrier.

In 2000, the results are very similar. Ontario, British Columbia, and, to a lesser extent, Alberta, remain above the national average (60 per cent) in terms of overall Internet access. Although there has been a distinct increase in the proportion of respondents from Quebec that say they have used the Internet in the past three months, Quebec still lags nine points behind the overall average (51 per cent, up from 40 per cent in 1999). The 2000 rate of Internet access in Newfoundland is similar to the 1999 findings, which rank the province far below the national access levels for 2000. Due to the small sample size from Newfoundland,

however, it would be prudent not to analyse and comment further on these results.

TABLE 4.3 REGIONAL DIFFERENCES: Level of Access						
	n	Internet		Main reasons why no Internet access from home		
		In past 3 months	At home	Cost	Interest	Need
1999						
BC	663	56%	44%	32%	51%	17%
AB	486	56%	42%	39%	29%	32%
SK	179	47%	30%	52%	24%	24%
MB	191	52%	38%	41%	35%	24%
ON	1886	56%	46%	44%	28%	28%
QC	1210	40%	29%	42%	36%	22%
NB	124	40%	35%	43%	30%	26%
NS/PEI	177	49%	33%	46%	27%	27%
NF	90	51%	40%	50%	42%	8%
Total	5006	51%	40%	42%	33%	25%
2000						
BC	647	66%	57%	43%	21%	36%
AB	481	62%	49%	38%	26%	37%
SK	163	57%	48%	40%	27%	33%
MB	183	53%	44%	38%	25%	37%
ON	1831	65%	59%	34%	30%	36%
QC	1222	51%	42%	40%	36%	24%
NB	126	53%	43%	40%	27%	33%
NS/PEI	181	58%	46%	35%	32%	33%
NF	90	48%	41%	24%	36%	39%
Total	4924	60%	51%	38%	30%	32%

The 2000 survey results indicate that home access is once again highest in British Columbia and in Ontario and significantly lower in Quebec, New Brunswick and in Newfoundland. As for the different types of non-users, the cost-effect is strongest in British Columbia (mentioned by 43 per cent, compared with 38 per cent overall) and lowest in Newfoundland (24 per cent).

In Quebec, where the level of home access is among the lowest in the country, there is very little divergence from the overall mean for the main

reasons why respondents do not have Internet access from home. Compared with other Canadians, they are slightly more likely to indicate that a lack of interest is the main reason why they do not have Internet access from home (36 per cent, compared with 30 per cent overall). Respondents from Quebec are among the least likely to say that the reason they do not have Internet access from home is because they do not need it (only 24 per cent of non-users, compared with 32 per cent nationally).

5.0

Technical Literacy and Social Capacity

In addressing the question of ameliorating the digital divide, a broad range of contingencies come into play. These include the capacities of individuals (economic, literacy, interest, need); available technical resources, available institutional supports and services; the opportunities and limitations of the immediate social context in which people live (community circumstances, economic and social relations); work (employment status, type and requirements of work); and the nature and impact of changes in the broader economic and social environment (regional, national, or international).

At the most immediate level, all individuals require some basic means or resources to realize goals of economic and social inclusion and betterment, whether these are skills improvement, employment, or social participation. Access to and use of the Internet can be an important resource in this process, though it must be recognized that other factors inform the relevance of using technology and the degree to which such access will be possible and beneficial.

Enabling factors for individual participation and development include: income, education and literacy, health, physical ability and so forth. Disadvantages or discrepancies in these areas are obstacles for people in realizing their potential for development, and social and economic participation and inclusion. In turn, these individual capacities are reflected at the community level, and concern issues related to the overall health and diversity of economic and social institutions and services in a community or region. The potential for individual betterment through training, education, and participation relies to a significant extent on the potential of community resources and institutions to facilitate these activities. Individual betterment depends on the existence of opportunities or incentives that give individuals a

rationale for engaging in training, learning and related activities in the first place.⁵

In addressing the digital divide issue, some of the most basic starting points are the technical literacy of individuals; the capacity of community organizations to facilitate the access and fulfil training needs of individuals (and to do so on an ongoing basis); and the value and usefulness of on-line content.

CAPs and CLNs⁶ are constituent components in the broad mix of resources required to accommodate and facilitate the sophisticated progression of ongoing learning and participation in the community. Services delivered by integrated or linked community organizations (as part of a public service model through community-based networks) can be an important resource to help individuals move from basic literacy and technical skills, to more advanced literacy and skills, and the practical application of these. These networks can provide linkages and content/service integration among individuals, education organizations, businesses, NGO's, governments and other community development services and organizations. These networks also act as gateways or linkages to other distant resources, such as federal or provincial governments, training resources, etc.

Users and Non-Users

At a general level of analysis, there tends to be a certain ambivalence by non-users about the overall benefits of the Internet or other new technologies. While many non-users see such developments as positive, they could not say what the specific benefits are, or will be..

In a comparison of a number of potential benefits of Internet use, there were no major differences between the expectations and attitudes of Internet users and non-users. Both groups tended to feel that, overall, there would be benefits, though this feeling was somewhat stronger with Internet users. Higher income, better-educated Canadians were more likely to expect that individual and social benefits would accrue from Internet use (for example, success in life, advantages for children, help Canadians in rural areas).

⁵ See, for example, A. Sen, 1999, *Development as Freedom*.

⁶ CAP – Community Access Program site; CLN – Community Learning Networks.

Internet users more likely to succeed in life

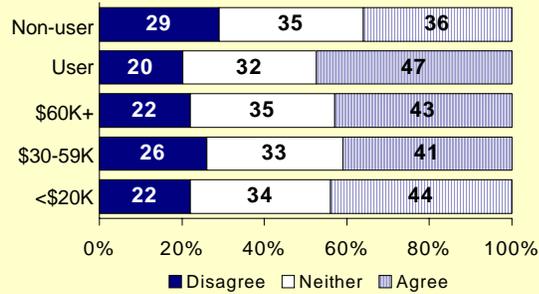
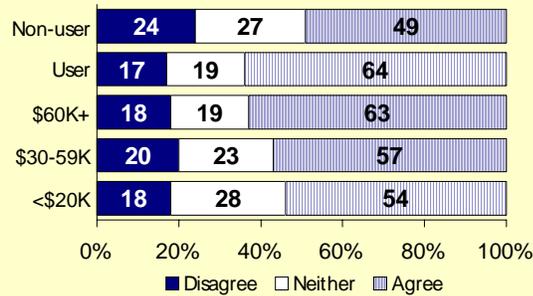


Fig. 5.1

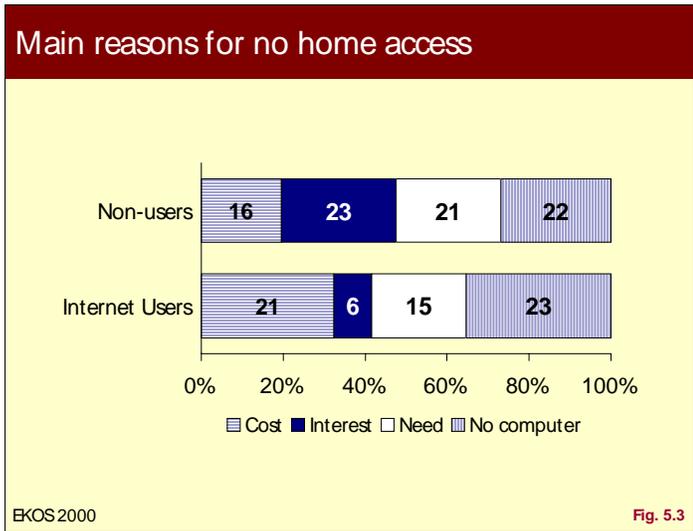
Children without Internet access are at a disadvantage



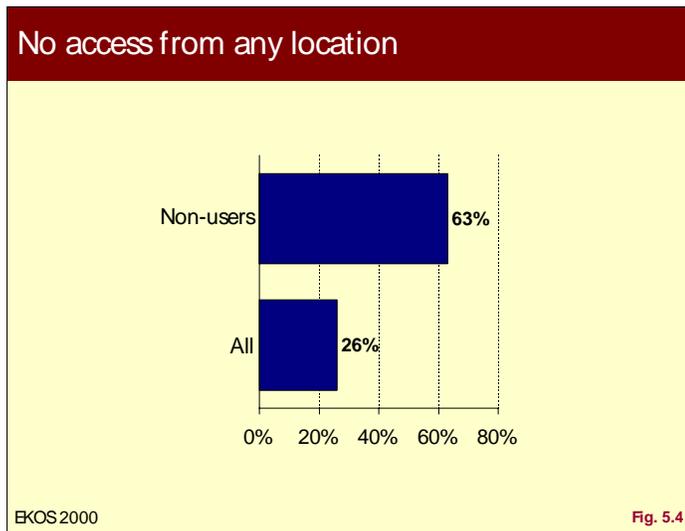
n=1977, EKOS2000

Fig. 5.2

One major factor that affects the views of many non-users is the lack of perceived value or need for the Internet. Cost and other barriers are significant for a number of non-users, particularly those who have used the Internet at some public location and would like access from home. But for many others, lack of interest and lack of perceived need are of greater importance as reasons for not having home access. The lack of a home computer is also a major reason why both Internet users and non-users do not have home access. The lack of a home computer can be the result of affordability barriers or again a lack of interest.



In terms of expectations for the future use of the Internet, non-users are fairly evenly split into two groups. Asked if they agree or disagree with the statement that at some point they are sure they will have to start using the Internet, a slightly larger number (45 per cent) agreed than disagreed (40 per cent). Non-users are more divided about whether they have any interest in using the Internet. Almost half (48 per cent) had no interest, while about one in three (34 per cent) had interest in using. While lack of interest is a strong factor, there is some acknowledgement by the more ardent non-users they will have to use the Internet at some point. Disinterest about the Internet also carries over to levels of awareness about existing public opportunities to learn about or use the Internet, or the fact that, for many, local opportunities for Internet access do not yet exist.

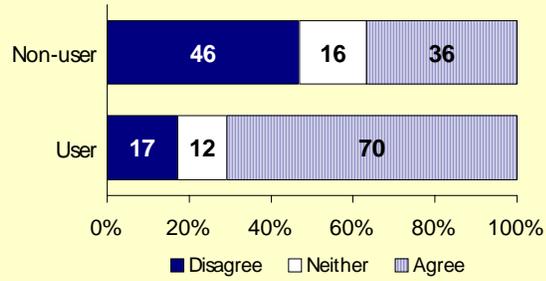


While a quarter of the overall population reports not having access to the Internet from any location, almost two thirds of non-users report lack of access.

However, factors other than the availability of Internet access from some location are also at play. Many non-users are not confident about their technical skills or abilities, some fear technology, while still others have little interest and do not see that as problematic. As demonstrated in Figure 5.5 below, there is a considerable difference in the comfort level with technology between Internet users and non-users. Moreover, as shown in Figure 5.6, while many non-users don't have home computers (because of high cost, lack of interest, etc.), very few actually consider this to be problematic (Figure 5.7).

Techno-savvy Canadians

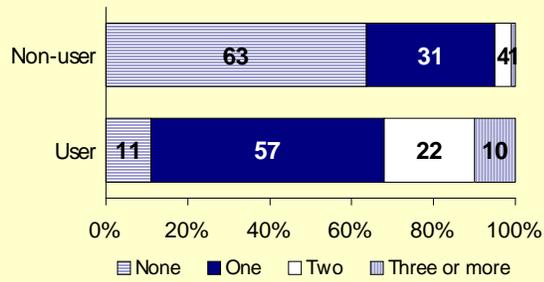
I am the kind of person that likes to figure out how technology works on my own



n=5008, EKOS2000

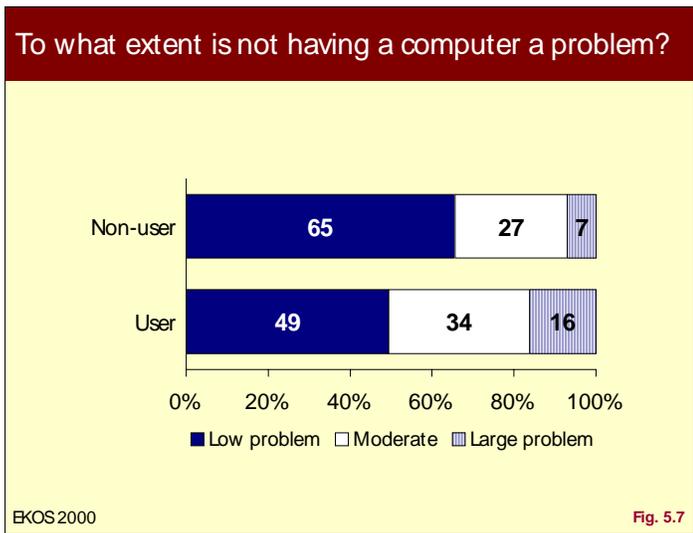
Fig. 5.5

How many home PC's?

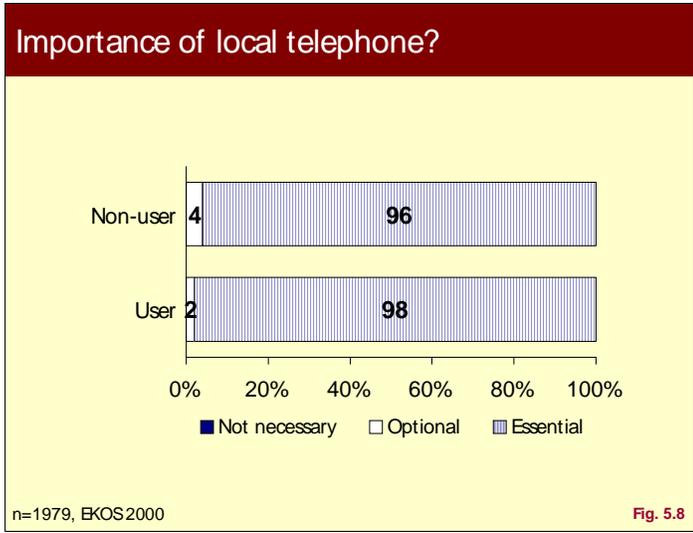


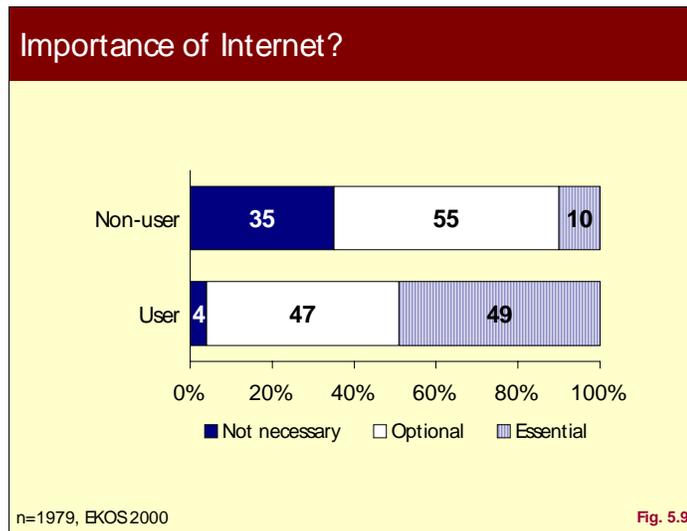
n=5008, EKOS2000

Fig. 5.6



There is also a significant difference in value attached to the Internet between users and non-users. There can be many explanations for this, including lack of experience using the Internet, perceptions on whether specific needs can be met through on-line access, and lack of awareness of available content or potential benefits of the Internet. While there is a similarity in views by Internet users and non-users about how essential standard household communication services are, there is a marked difference of opinion about the Internet.

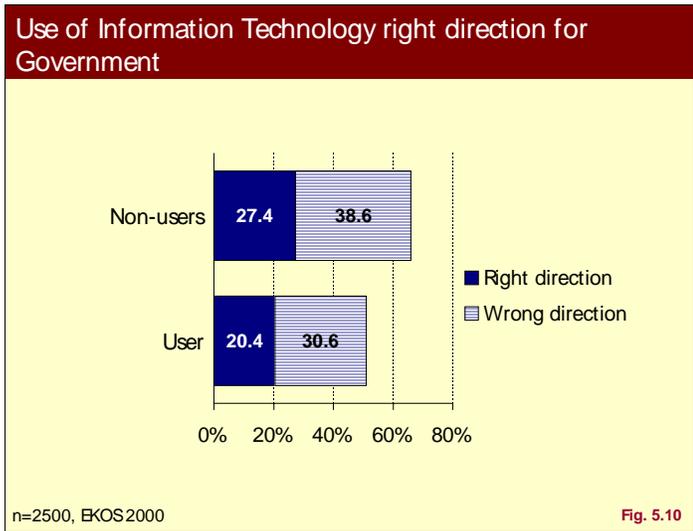




Attitudes and Practices of Non-Users as Compared with Users

While there is a significant number of non-users who face real barriers (for example, affordability, literacy, etc.) to using the Internet, the issue of the perceived lack of relevancy or value of the Internet is an important consideration for many. These are fairly set views suggesting that these individuals will not be particularly likely to use the Internet in the near future, or if they do, will do so only on an occasional basis. Individuals in the non-user subgroups use a range of other communication technologies in their daily activities, so reluctance to use the Internet is not just a technophobic response.

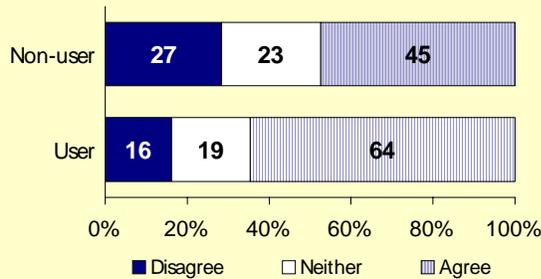
For example, while both users and non-users are generally supportive of an increased use of new technologies in business and government, the degree of this support varies. As compared to users, there tends to be much less support for an increase in the use of technology by government with non-users. But, non-users still tend to favour the use of new technology with a little over half (56 per cent) thinking that this is a good idea. Many non-users need to be convinced that new technology, like the Internet, is as valuable as it is popularly claimed to be. For example, more than one in four (26 per cent) non-users strongly believes that the government's use of technology is the wrong direction to go.



There is somewhat less support (46 per cent) by non-users in their views about the effectiveness of using the Internet to communicate with government about programs and services. Interestingly, on the face of it, support for this type of communication is somewhat less than one would expect from Internet users (64 per cent). However, findings indicate that there is a preference for choice among the range of technologies available to communicate with government or other organizations. This finding reinforces previous research in this area.⁷ This research showed that a full set of traditional means (for example, mail, in-person, fax, phone), as well as the Internet (in other words multiple channels), are required to adequately meet people’s real, daily communication needs.

⁷ *The Dual Digital Divide*. PIAC, 2000.

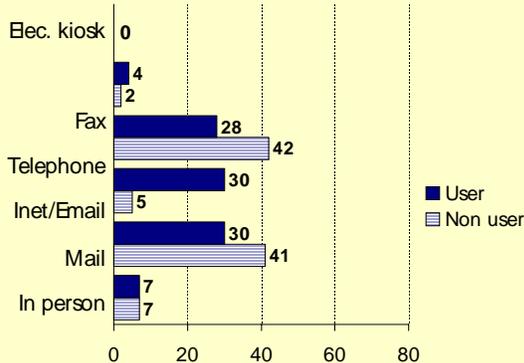
The Internet is an effective way for government to communicate with Canadians?



n=2500, EKOS2000

Fig. 5.11

Preferred method to communicate with federal government

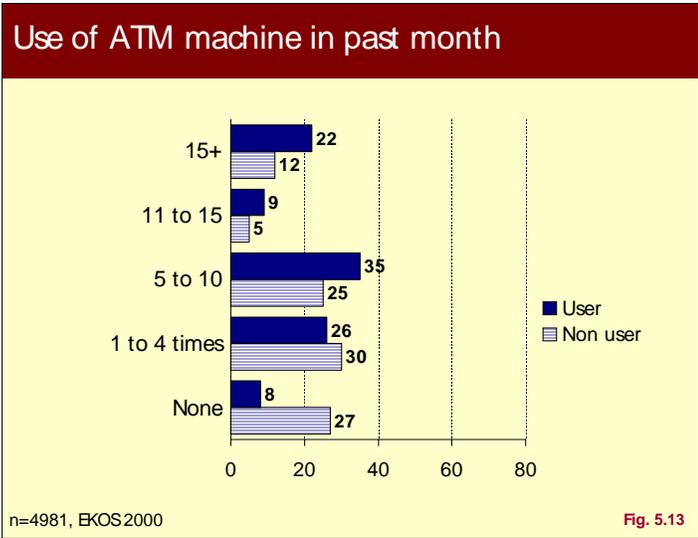


n=1025, EKOS2000

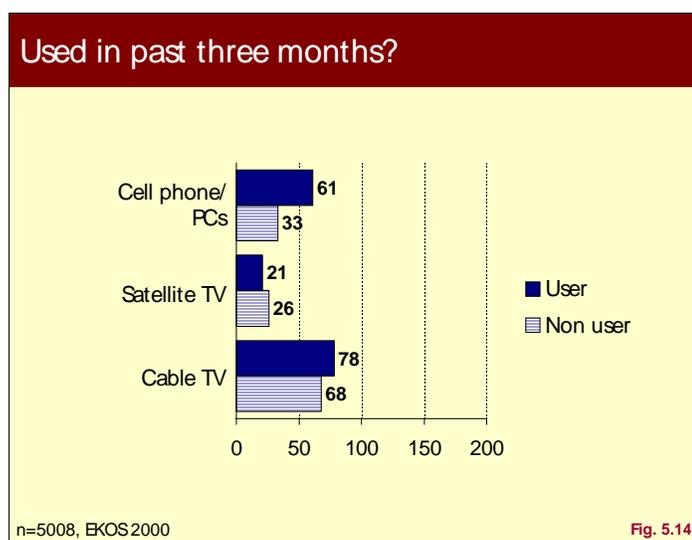
Fig. 5.12

At the same, it would be a mistake to assume that all Internet non-users are simply Luddites (oppose new technology). Where there is value and convenience of a service, coupled with an extended period of familiarity with a new technology (one that is available at a reasonable price), a significant number of non-users use the technology at similar levels as users. At the same time, and this is important for both policy makers and the market, there is a significant minority who do not use such technologies. This could be due to time lag in adoption, disinterest, inability to use the technology due to very real, deep-seated structural barriers such as cost and illiteracy, among other reasons.

For example, as shown in Figure 5.13, with ATM's (Automatic Teller Machines), which are well established in the market even though they are a somewhat recent technology, a strong majority of Internet non-users use this technology on a fairly regular basis, comparable to that of Internet users.



The same holds true with other technologies. While there are real class (for example, affordability) and other barriers (for example, geographical location) which limit access, many Internet non-users find particular value in these, often at levels comparable to that of Internet users.



Importance of Community-based Training for Non-users

An interesting story emerges when those in the 'near user' subgroup who face training and affordability obstacles are examined.

A study on recent and new users of computers and the Internet in a Toronto, Canada, neighbourhood demonstrates how a properly planned and resourced community access service can greatly contribute to overcoming technological illiteracy and affordability barriers.⁸ The study followed fifty-five recent and first time computer and Internet users at a public access site over a six-month period. This research also included a needs assessment study of residents in the immediate neighbourhood. Households in the area tended to be lower income, less educated and included a significant number of people for whom English is not the first language.

The community organization St. Christopher House offers a wide range of services to meet the diverse needs of individuals, families and groups. These services include literacy training, services for the homeless, community development, seniors' services, and others.

⁸ *Report on Local Residents and the Internet*, PIAC, November, 2000. The study was conducted by the Public Interest Advocacy Centre, EKOS Research Associates Inc., and Connectus Consulting, in collaboration with St. Christopher House.

Internet and computer access are new services added to this broader set of activities.

An important finding of this research was a reaffirmation that human capacity development requires substantive and ongoing training in general skills as well as technology in order to have a long-term benefit. Ongoing support and training assists individuals in utilizing the full potential of resources and services available and, in turn, realizing their potential capabilities. Community capacity development also requires that community organizations providing various services be sufficiently resourced (funding, staff, equipment, expertise, etc.) over the longer term. Support and resources must also extend to the specific programs intended to assist individuals in training (technical access, Internet, standard literacy, employment skills, etc.). Support for these organizations and the range of services they provide, is a constituent component for the organizations and their clients being able to successfully participate in, and contribute to, broader community economic and social capacity development.⁹ The gap between those organizations with and without these resources and skills is another dimension of the digital divide; specifically that of community social infrastructure.

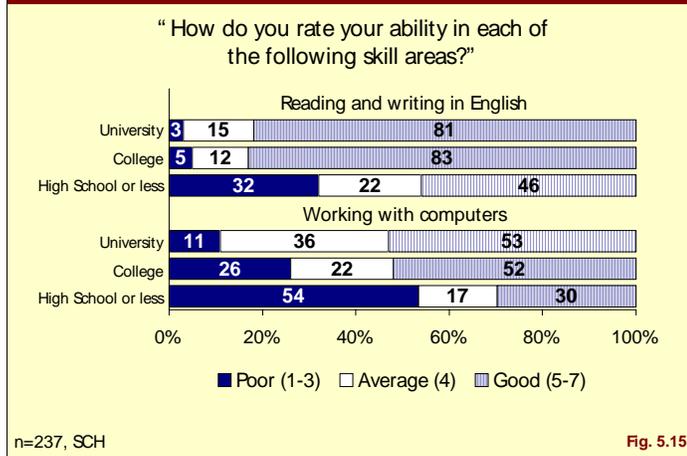
Research has shown that those with a higher level of education (and therefore literacy skills), have also higher levels of confidence in using computers and the Internet. Those with lower levels of education (particularly high school or less), are much less likely to express confidence in the skills necessary to use and benefit from computers and the Internet. In the Toronto study, these problems were further aggravated for those whose first language was not English.¹⁰

The challenges of general level literacy and skills training are further aggravated by the need for relatively reasonable levels of technical literacy and computer skills which are crucial for using and navigating the Internet.

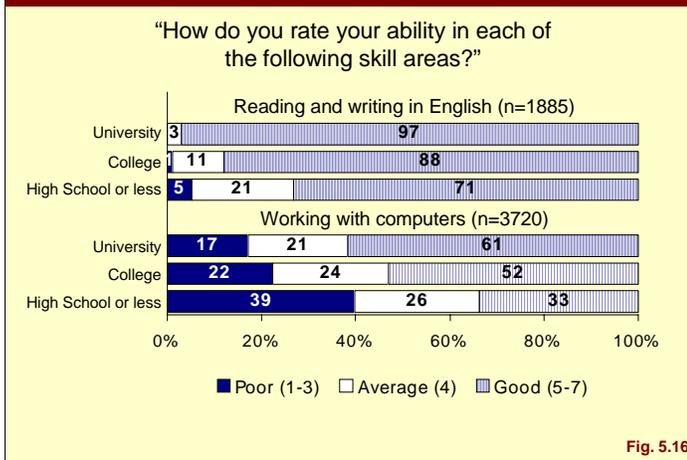
⁹ *Report on Local Residents and the Internet*, PIAC, November, 2000.

¹⁰ Ekos Research, 2000, *Rethinking the Information Highway*.

Toronto study comfort with skills



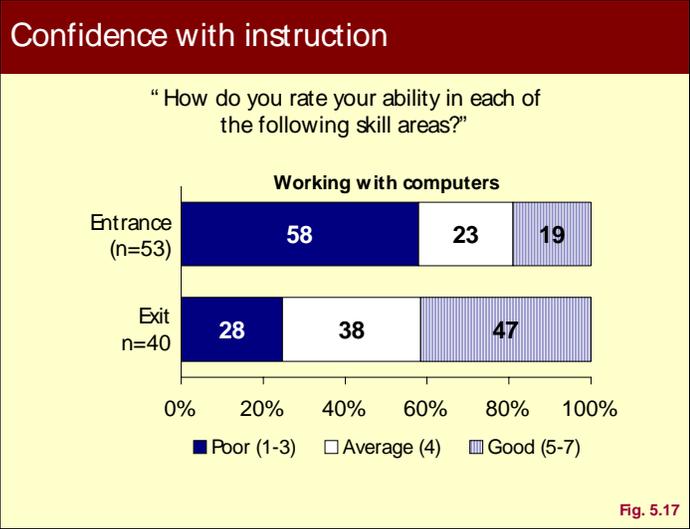
Canada comfort with skills



In the six month Toronto pilot project study on computer/Internet training and use, both new and recent computer/Internet users stated at the outset that improving their basic technical skills was the major reason for participating. This was followed by information/benefit seeking activities such as searching for work and other skills training, word processing, improving skills to get a job, and finding information. By the end of the pilot study, participants had developed a reasonable level of confidence in their technology skills, but still had a strong desire to continue (both technical and other skills) training. An interesting side benefit from the

project was that by locating Internet access terminals in the same room as the English literacy lab, enrolment for standard literacy increased. This was in part due to the fact that those attending literacy classes were first in line for the computers and the Internet at the end of class.

In terms of skills training, there was a marked increase in skill levels for participants over the course of the pilot. A minority (19 per cent) felt their computer skills to be excellent at the outset of the pilot, but this grew to almost half (47 per cent) six months later. The perception that individuals had developed average computer skills also increased through this training. By the end of the pilot, participants had developed confidence in their Internet skills, with over half (55 per cent) rating their skill level as excellent, and almost a third (30 per cent) as average.



As shown in Table 5.1, at the outset of the pilot program, individuals were primarily interested in basic skills training (Internet, computers, search for jobs, word processing), while the functional and content related on-line activities were of marginal or almost no interest. This largely reversed once basic skills had been learned. While some ongoing skills training continued to be important to these new users, they became more interested in ways they could benefit from, communicate and interact with the technology.

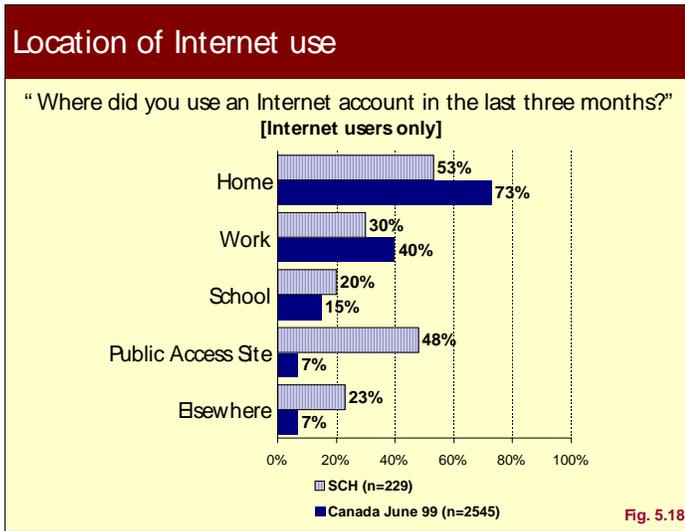
Table 5.1
Reasons for Using Internet*

Reason	Start	End
To learn about the Internet	67%	5%
Improve skills in using computers	61%	25%
To search for jobs	37%	18%
To learn how to do word processing	35%	--
To improve your skills to get a job	33%	--
To find information	6%	50%
To use email	2%	28%
Other	7%	16%
* "What is the main reason why you want to use the Internet at this CAP site?" Entrance (n=54); Exit (n=40)		

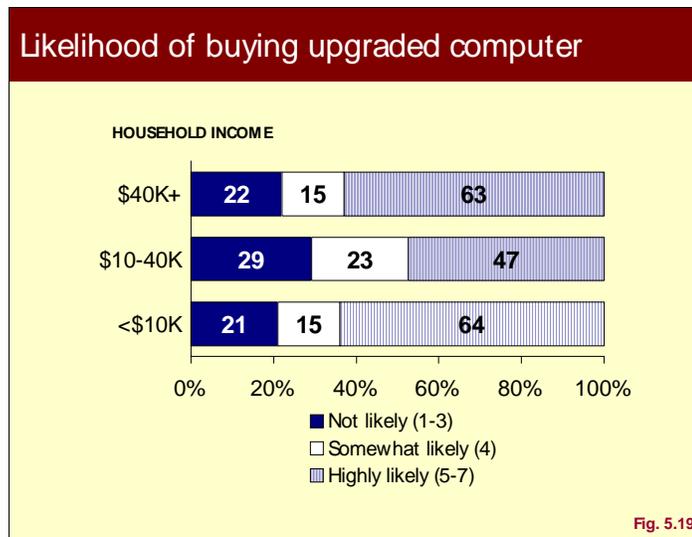
As shown in Table 5.2, the search for relevant information exceeded the initial expectations of new users conducting this activity. Participants had a broad range of information interests. The most sought after information tended to be related to personal benefit or social service in nature.

Table 5.2 Internet Activities — Intended vs. Actual		
Activities	Intended*	Actual**
Searched for work or new career opportunities	68%	74%
Searched for medical or health-related information	58%	74%
Searched for information on training and other education-related activities	48%	85%
Searched for information on government services or programs	53%	69%
Compared prices between different products and services	44%	70%
Searched for information on community groups and services	8%	59%
* "How likely is it that you would use the Internet in the next year for the following activities?" Entrance (n=54)		
** "In the past 3 months, have you done any of the following activities on the Internet at St Christopher House?" Exit (n=40)		

The broader community needs assessment found that the presence of community-based Internet access and training increased the use rates in the social sub-groups that were traditionally found to have low or lagging technology adoption rates in Canada (for example, low income, less education), and these were actually significantly higher than the national average. In fact, providing access in an established community organization that was already familiar to residents helped facilitate usage. Facilitating access and training through a community organization (which also offers many other services) has helped draw many 'near users' on-line. In fact, in the Toronto study, there was a seven-fold increase in the likelihood of people using a public access site to go on-line than the Canadian average.



Interestingly, there was also a fairly high degree of interest in the neighbourhood of purchasing a used and upgraded Internet-ready computer. This included the lower income groups.



After learning the basics of computers and Internet, there was a strong desire for learning and skills-based information and development services. This parallels the findings of national research (Ekos). These findings suggest a clear recognition of the importance of skills and a readiness by these individuals to improve their economic and social participation through training. This interest in self-development by lower

skilled Canadians affords opportunities for community organizations to provide a range of innovative formal and informal approaches to education and skills upgrading (for example, schools, NGO's, literacy groups, labour councils, business partners, etc.). Moreover, the availability and continuing development of CLNs and CAP sites will be important resources in supporting and acting as a catalysts for integrated community-based learning, training and, economic and social development strategies.

Community Organizations and Networking

The mandate, resources and scope of activities of a community organization have implications on the degree of success of providing the public with technical access to the Internet, and using these resources in combination with other programs and services to achieve broader capacity development objectives. These broader functions are constituent of enhancing the overall economic and social capacities of people using the facilities, and in turn, communities at large.

At a basic level, public access sites have a role as public services allowing users who have some degree of expertise to use the Internet. Properly located throughout communities, the role of public access sites is not unlike that of public libraries. At a more substantive level—that of capacity development (individual and community)—the Toronto study clearly demonstrates the importance of using computers and the Internet as resources to support a range of separate and interlinked services and activities (for example, community outreach, job skills, literacy, seniors' programs, linking with external organizations and their services).¹¹

Part of the success in using technology in this way is introducing it based on the needs of the immediate community as opposed to having a predetermined technological design limit on what the organization is able to do. In the Toronto study, integrating technology into programs based on the needs and interests of clients, volunteers and staff meant that the services were relevant and beneficial.¹²

¹¹ *Report on Local Residents and the Internet*, PIAC, 2000, p.40.

¹² *Report on Local Residents and the Internet*, PIAC, 2000, p.40.

The establishment of public Internet access at an established community service organization acted like a magnet for attracting interested 'near users'. These new users were able to benefit from Internet training and access, but also from the many other programs and services offered by the community organization, as well as other organizations that were partners or linked through other programs.

At an organizational level, however, the ability to provide a range of services to the community, and the addition of new communication services, is contingent on the capabilities and resources of the organization. These include staff time, training, adequate general resources, and establishing realistic expectations on the part of administration, staff, volunteers and clients.¹³ Without proper resources and a needs-based approach, there is a risk that the services provided will be inappropriate and the intended beneficiaries of the programs, the public, may become even more marginalized. A critical factor in success is partners' and government's ongoing support, both financial and in kind, for community organizations providing these services. Partners, industry and government benefit from the enhanced services of the organization in the community, and the improved skills and abilities of the public users. A common problem shared by community organizations involved in providing public Internet access, is that it is relatively easy to get computers (recycled and new), but almost impossible to get the more important resources that are necessary to maintain equipment and networks, provide training and other services, and develop useful and relevant content services.¹⁴

Economic and social community and individual capacity building requires a partnership approach that links different levels of government, public institutions, community organizations and business. Moreover, any development strategy, whether addressing the access divide, literacy and skills training, or other forms of capacity development, benefits by being founded on a comprehensive needs assessment that considers the particular economic and social factors, abilities and opportunities in a community or region. While many communities across Canada have similar obstacles and challenges, the

¹³ *Report on Local Residents and the Internet*, PIAC, 2000, p.41.

¹⁴ *Report on Local Residents and the Internet*, PIAC, 2000, p.41.

opportunities and capacities of individuals and communities to respond to these will vary greatly depending on their social and economic contexts. While the New Economy activities account for substantial growth in the overall economy, these still account for a minority of all economic activity. The remainder consists of traditional industries that are increasingly using new technologies to increase productivity and competitiveness (for example, mining, forestry, manufacturing, etc.).¹⁵ The majority of Canadians are expected to work in the modernized traditional industries as opposed to becoming part of the core information economy workers.¹⁶ For most communities and individuals, capacity development will be built on the existing base of social and economic activities, rather than making a radical departure or displacement to new information services. This means that a common model imposed from outside will not likely be viable (for example, thinking of an earlier era in Canada's development, not every person or community can grow Canola. Similarly, the successful development of economic and social activities and services, including those as part of the new information society, will in large part be informed by local factors and resources, and will need to evolve from these. Capacity development, therefore, involves both traditional and new economic and social activities. As an example of the importance of the need to consider capacity development in broader terms than an Information Society, the federal government has identified skills development and life-long learning as major policy goals in response to a looming crisis in Canada whereby a shortage of skilled workers may exist in the future in a range of sectors, including the trades, and for small and medium sized business.

In another example, the Province of Newfoundland and Labrador has developed a very progressive and detailed strategy for social development that is linked to, and fosters, economic development. The strategy focuses on traditional sectors as well as information society activities. (*People, Partners and Prosperity*, 1998).

While requiring outside assistance in realizing capacity development, economic, social and political interests in most communities already have a good idea of the needs and challenges facing them, and often

¹⁵ "Don't Dismiss the New Economy Hype as Hot Air", B. Little, *Globe and Mail*, September 18, 2000, p. B12.

¹⁶ Speech, L. Burton, OLT Conference, Montreal, February 23, 2001.

have long-standing established working relationships among organizations at the community level. However, need does exist for outside resources (funding, expertise, information, etc.) to help facilitate progressive change for individuals and the overall community.¹⁷ Such support needs to be provided over a significant period of time (for example, years) so that the community infrastructure can be developed in an effective way, and that individuals can develop the proper skills and be able to realize opportunities.

Existing community access and networking services are already feeling the pressures of attempting to meet service demands, with these problems likely to become more acute as more non-users, particularly those with extensive training and literacy development needs, begin accessing these services. For example, barriers to continuing offer access services over the longer term for existing CAP sites include: equipment upgrades; lack of staff and volunteers; general funding requirements; and the cost or lack of communications or bandwidth. Without federal funding, a little less than half of community access sites would continue providing current levels of service (41 per cent), with the others cutting back on the very resources or services regular or occasional site users actually need, for example, reduce hours of operation (15 per cent), site closures (13 per cent), fees for Internet access (11 per cent), reduced or no training (10 per cent)).¹⁸ Public access sites that are networked are showing signs of achieving some efficiency in service delivery. For example, as compared with many single sites, networked groups tend to offer better services in the areas of distance education, community information, and training, while offering about the same level of service for general Internet access.¹⁹ Federal support for a number of CAP sites, suitably located in communities, will be required to facilitate an ongoing public service role, and to fulfil demand for an emerging role as a constituent component in integrated community access, learning and capacity development initiatives.

¹⁷ V. Rideout, "Public Access to the Internet and the Canadian Digital Divide", forthcoming, 2001.

¹⁸ "Community Access Program: Census of Sites", Draft Report, February 2, 2001, Industry Canada, pp. 25-28.

¹⁹ "Community Access Program: Census of Sites", Draft Report, February 2, 2001, Industry Canada, p. 26.

With the public policy objectives of overcoming the access, skills training, and capacity development divides, the use of information and communication technology (such as through the CAP and CLN programs) is proving to be an important supportive resource for individuals and community organizations. For those providing services to the less connected equity groups, these services can help community agencies (for example, schools, libraries, community centres, etc.) improve the services they provide. The technologies also allow the organizations to link to other organizations in the community and elsewhere to share resources and services, and improve overall service delivery for both equity groups and the general public. These activities also provide opportunities for greater collaboration with businesses in linking skills training, employment and economic innovation, and growth in the community (for example, apprenticeships and skills training).

Major challenges, however, include the lack of availability of sufficient and properly designed resources (financial, informational, etc.) from different levels of government; the need for the development of expertise within the community in understanding the potential benefits of using technology in these ways; and the way to access and most efficiently use outside resources (for example, government support).

Based on the capacity development mandate of the CLN program of HRDC, the establishment of provincial or regional CLN community assistance teams could help community organizations through sharing expertise on strategies and activities needed to address issues relating to access, training, partnerships, capacity development and resources. Such teams could be made up from a pool of individuals from community organizations in the province or region. These individuals should have had success and developed expertise in these different activity areas. Such teams would need to work closely with HRDC regional and national personnel to be effective.

A range of organizations, institutions and businesses need to be collaborating at the community level if skills training and access initiatives are to lead to skills portability and employment flexibility, and social inclusion for individuals, and improved service delivery opportunities for institutions within communities.

Such a broader approach will facilitate the needs of particular organizations, and will also address the broader needs of individuals. HRDC's CLN program is ideally suited to act as a catalyst to facilitate greater coordination and delivery of services at the community level. It is also a useful model that could help to coordinate and link various federal resources and other initiatives into manageable and effective delivery models that are easier to access and use by community organizations. CLN resources are limited however, and the program should not be expected to displace the various other federal forms of support or programs specifically aimed at helping communities or organizations deal with such issues as access, literacy, and training. Instead, the CLN has great potential as a catalyst and organizing device to provide an innovative way of instilling coherency for initiatives at the federal, provincial and local levels.

Interestingly, Canada appears to be at a crossroads in the development of the Internet and other on-line services. On the one hand, these could develop narrowly as entertainment, retail consumer products, and business-to-business products. Or, these could also feature a major public service role, part of which supports the diverse, innovative approaches which are emerging across Canada to address Canadians' needs in the areas of: education; training; social, cultural and economic participation and development; as well as community capacity building.

Historically, Canada and other countries, missed realizing similar opportunities to develop sophisticated, comprehensive and effective education, training, and social and cultural public services through other media, such as television. Public broadcasting, including provincial education television, has made some contribution to these goals in the past, but the full potential was unrealized. Canada is again at a key crossroads, this time with on-line technology, where government commitment to a progressive public service model involving individual and community development can help realize broader policy objectives in these areas, as well as complement the development of the commercial market place.

6.0

Selected International Initiatives to Close the Digital Divide

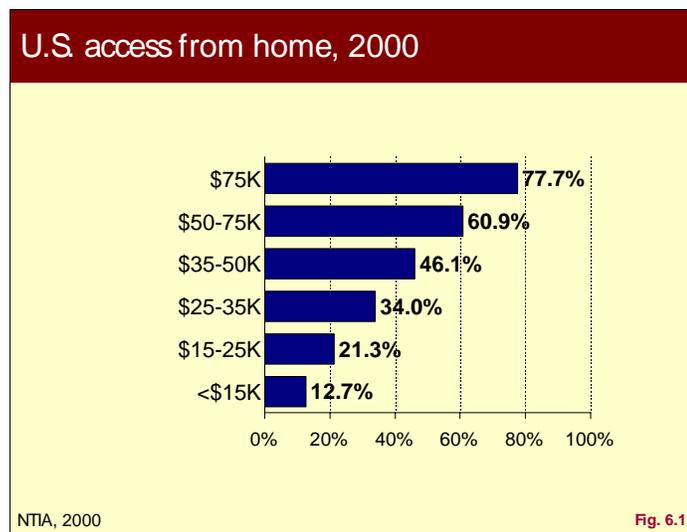
The sheer number and diversity of innovative approaches undertaken to address the digital divide at the national and sub-national levels in other countries defies simple categorization and detailed description. Like Canada, such initiatives exist at the levels of national or regional governments, community and the private sector. The choice of approach in other countries is informed by the social and economic objectives of national governments, the needs of individuals and communities, and the availability of resources. While selectively considering some activities in other countries, this section focuses mainly on efforts in the United States because of the comparable nature of the Canadian and the U.S. market places; the development of the Internet; and the relative maturity of access initiatives as compared with other countries. Both developed and developing countries are involved in a host of initiatives in attempts to close the various 'digital divides'. While Canada continues to be a leader in both access and addressing digital divide issues, this overview may suggest other activities from elsewhere which may be of some relevance to Canada.

An interesting common sub-theme that tends to emerge from the literature is that while great efforts are being made, and many successes have been realized, it is quite likely that many of the 'divides' will not be completely closed. For example, in the context of access to and the use of the Internet, even if broadband services were to be provided to every individual, it would still not mean that people would have the capacities, needs or interest to use the service. In some instances, such lack of use will be by choice, in others it will be due to circumstances that are obstacles for individuals (such as income, illiteracy), thereby leaving a significant 'have not' component in society. For example, through several initiatives in Seattle, United States, eighty-eight per cent of citizens have access to computers and seventy-six per cent have access to the Internet from home, with the remainder accessing from CTC's work. However, connecting the remainder of people is considered to be a major challenge with the risk that with the majority of citizens connected, those remaining unconnected will now be at a greater disadvantage and marginalization both for Internet access

and in their ability to use information and communication technologies (ICT) in work and other life activities.²⁰

The above example, and other examples of digital divides, are important policy problematics because the integration of information and communication technologies into society, work, and governance is pervasive and inevitable. People need to be competent in communication and technology in order to be full participants in society. This is increasingly important and will be critical for those who are already marginalized in society due to other social and economic factors.

The United States, like Canada, has made considerable strides in connecting its citizens, and, like Canada, features differential levels of access based on such variables as class, education/skills, geography, and lack of need/interest. In a comparison of general access trends from home and public locations, Canada is faring better than the United States.



Source: Falling Through the Net: Toward Digital Inclusion, National Telecommunications and Information Administration, October, 2000.

²⁰ "Closing the gap a two-edged sword", W. Englund, Technology Education Coordinator, Seattle Community Network, digitaldivide@benton.org, Jan. 18, 2001.

In the United States, of the almost half (47 per cent) of the population without home access, the majority tend to be low income households or seniors. As with Canada, cost, technical skills and a lack of perceived benefit or need are the main reasons why people do not have access.²¹ Calling for greater action by the federal government to provide training and access, researchers in the United States conclude that the Internet boom is expected to slow down due to cost obstacles and a lack of interest. For example, over half of non-users (57 per cent) are not interested in being on-line, and one in three non-users (32 per cent) have indicated that they will definitely not get access.²²

There are several regulatory initiatives in the United States intended to increase telephone and Internet access. For example, basic telephone costs, a barrier to many in addition to the costs of computers and the Internet, are reduced for many Americans through various lifeline and link up programs. Canada does not yet have a comparable telephone access regulatory initiative (with the exception of high-cost serving areas). Stemming from the United States Telecommunications Act (1996), an E-rate was introduced to provide universal Internet service for schools, libraries and communities. This program was budgeted for the current year at US\$ 2.25 billion. Canada does not yet have this type of regulation-based program, though it does provide assistance to public institutions through federal and provincial fiscal programs.

In 1999, over eighty two per cent of public schools and over half of libraries received discounted telecommunications service through the E-rate. While Canada has been more successful in providing connectivity to all schools and libraries through the SchoolNet, LibraryNet and CAP programs, we have not developed fiscal or regulatory-based initiatives to deal with the ongoing connectivity or operational costs for community access and networking initiatives.²³ The CRTC implemented an industry-driven plan that could permit a deferral of communication costs for libraries and schools. However, this initiative has been unsuccessful

²¹ *Disconnected, Disadvantaged, Disenfranchised*, M. Cooper, Consumers Federation of America, October 11, 2000; *Gartner's Digital Divide Report*, October 2, 2000.

²² "Who's not on-line", A. Lenhard, Pew Internet and American Life Project, September 21, 2000.

²³ "E-Rate to Receive Full Funding", News Release, Federal Communications Commission, April 13, 2000.

because what the public institutions need is a reduction in costs, not a deferral.

In the United States, two initiatives that are somewhat similar to the CAP and CLN programs are the Community Technology Centers (CTC) and the Technology Opportunities Program (TOP).²⁴ At the time of writing, the degree to which support for these programs would continue under the Bush regime was not clear.

CTCs offer services similar to CAP and CLN, but they tend to be located in disadvantaged communities and neighbourhoods, as compared with the broad-based community distribution of sites in Canada. CTCs are located in schools, libraries, community centres and public housing facilities. Established in the 1980s, these community centres provide a range of education and skills upgrading services in addition to Internet access. As experienced by the CLNs and CAPs in Canada, CTCs face ongoing challenges involving sustainability funding, increasing demands by the public for more services, technical support, effective content, program standards, and the need for more partnering.²⁵

The TOP program, initiated in 1994, provides grants to non-profit organizations and state governments to help bring the benefits of information and communication technologies (ICT) to rural and underserved areas. By 2000, matching grants totalling US\$135 million had been made. Applicants raised US\$339 million as their share of contributions. As with the CTC program, requests for funds greatly exceed the monies available. For example, in 2000 US\$12.5 million was to be awarded out of \$270 million in requests. The consistent under-granting of requests year after year indicates that federal resources made available to help close the digital divide are greatly under-funded. TOP is intended to provide start-up money for innovative ICT projects. The closest parallel at the federal level in Canada is the CLN program,

²⁴ CAP – Community Access Program, Industry Canada, CLN – Community Learning Network, HRDC.

²⁵ “New Consortium to Help Bridge the Digital Divide”, Press Release, Education Development Center, Inc., Newton, MA, September 22, 2000.

although the CLN is somewhat broader in mandate and scope for individual and community level capacity development.²⁶

The wide range of activities by TOP grant recipients underscores the diverse, myriad initiatives undertaken by communities and community organizations in the United States to meet needs and address digital divide issues. As in Canada and elsewhere, the types of activities undertaken by community groups are only limited by imagination and resources. This range of initiatives is based on a response to the diverse needs of citizens, community groups and communities in the context of their immediate economic and social conditions. Like the CLN, the effectiveness of the TOP program is in part due to its flexibility in criteria for support. A few examples of TOP initiatives include linking domestic abuse centres; making local government more accessible to citizens; telemedicine for day care; smart cards to increase volunteerism; high speed DSL to low income homes; wireless access to remote areas; citizen access to interactive cultural products; linking NGO's in communities; on-line education to rural areas; community services on-line for citizens; skills training and employment assistance for the unemployed.²⁷

The participation of business in the U.S. to close the digital divide is based on both social obligation and corporate self-interest. As with Canada, many businesses make some level of contribution at the local and national levels, but there appears to be greater involvement by large, well-heeled national corporations in the U.S. Again, the types of initiatives vary widely based on the needs of the recipients and the interest of the companies. For example, the Fleet Bank started offering home computers with Internet access to low-income customers. It also provides in-house tutors, and support for community content development. This package also includes on-line banking software. E-Bay has established a partnership with SeniorNet to bring over one million seniors on-line. Numerous other consortiums and partnerships between business and non-profits provide computers, training, staff

²⁶ "Commerce Department gets 662 Grant Applications for Projects Aimed at Closing the Digital Divide", Press Release, Department of Commerce, April 6, 2000, <http://www.ntia.gov/ntiahome/press/top40700.htm>.

²⁷ "2000 TOP Awards", Press Release, digitaldivide@list.benton.org, September 28, 2000.

support, software, and content development, among other forms of support.²⁸

One interesting model is the Community Collaborative Fund in California. Established as part of regulatory approval for a merger, Verizon Communications provides a portion of its merger savings to the fund. The expected value of the fund is US\$25 billion. This program is interesting because it is administered by community groups at a regional level, instead of being a “top-down” program. In general, top-down programs have been criticized at times by community groups as being too blunt or generic in approach. Community groups apply to the fund for grants. This approach has the potential to be very responsive to the particular needs of local communities because of the close involvement of community interests at the granting level; NGO’s are represented in the management of the fund. The fund will direct money to programs in California that provide access to ICT services, education, telemedicine, literacy, economic development in low income, ethnic minority and disabled communities. There is no parallel to this kind of regulatory-based public benefits program resulting from mergers in the communication industry in Canada.²⁹

In some instances, as part of local regulation, cable television companies are being required to make contributions to help fund local CTCs, education and training programs, and Internet access for community groups. Regulation in Canada requires contributions from cable and broadcasting companies for television programming and new media content development. The focus for these has largely been commercial content as opposed to public content. Neither cable nor telecommunications regulation requires funding for these types of community access, training or related activities.³⁰

As with Canada, there are sub-national government-level initiatives intended to achieve connectivity. For example, Texas introduced a ten-

²⁸ “E-Bay partners with SeniorNet”, digitaldivide@list.benton.org, September 26, 2000; “Fleet Bank Premiers Community Link Initiative”, digitaldivide@list.benton.org, December 6, 2000.

²⁹ “Verizon, Community Groups Launch \$25 million Fund to Benefit Underserved Californians”, digitaldivide@list.benton.org, January 11, 2001.

³⁰ “Cable contracts and community technology funding”, digitaldivide@list.benton.org, September 27, 2000; “Good news for Cleveland”, digitaldivide@list.benton.org, October 3, 2000.

year, US\$1.5 billion program to connect schools, libraries, and rural health facilities, and to create community networks.³¹

There is a certain irony with the U.S. programs for indigenous content development. At international trade for a, and in trade agreements, the U.S. makes great efforts to have other countries remove their national regulatory and program initiatives that support domestic culture and content, including those of Canada. However, domestically, the U.S. spends billions of dollars supporting the development of exactly this type of content for the American public.

Content development for new media is supported through defence and aerospace programs, procurement by the federal and state governments, and direct expenditures by federal agencies totalling several billion dollars. For example, the three largest government agencies involved in the support of multimedia content in the areas of education, arts, heritage and culture are the National Endowment of the Arts (US\$94 million in 1997); the National Endowment for the Humanities (several hundred million since 1970's); and the U.S. Department of Education. Other agencies involved in public content development include NASA, the National Science Foundation, the Department of Energy, the National Library of Medicine, the Library of Congress and the Smithsonian Institution. While Canada also supports culture and content through, for example, different levels of government, cultural agencies and funds based on industry contributions, the amount for non-commercial cultural and social public information is comparatively much smaller in breadth and scope.³²

The importance of employing a diversity of approaches to address the digital divide based on individual, community and regional needs is further reinforced by the wide range of initiatives being adopted in other countries, as demonstrated by some selected examples described below.

The United Kingdom' (UK) has a goal to ensure that everyone who wants access will have it by 2005. Access can be from the home, work

³¹ "All the divides", digitaldivide@list.benton.org, September 21, 2000.

³² "Multimedia Policy for Canada and the United States: Industrial Development as Public Interest", Reddick, A. and Rideout, V. in (Eds. V. Mosco and D. Schiller) *Integrating a Continent for Cyber Capitalism*, Rowman and Littlefield Publishers Inc., Boulder, forthcoming, 2001.

or a public site. Similar to approaches in Canada and the U.S., the UK has provided significant funding for public access. By 2002, all 4,300 libraries will be on-line, and 600 on-line centres will be established where they most meet the needs of local people. These centres provide access and skills training. Other initiatives are also being pursued to increase connectivity. These include encouraging employers to assist employees in home access; recycled computers for 100,000 low-income families; access from post offices; and content development. Life-long learning initiatives include: infrastructure in schools, improving educators of ICT skills, content development, ICT work placement for students, and ICT courses for the unemployed.³³

While community networks and related initiatives are maturing in Canada and the U.S., they are still in the early stages of development in other countries, including Australia and the European Community. Instead of developing these more advanced services, many jurisdictions are establishing telecentres that provide Internet access. Telecentres, sponsored by foundations, governments and companies, are being established in many developing and mid-level countries including India, Colombia, Argentina, Peru, among others. Malaysia, for example, is not only setting up telecentres in villages to address the digital divide, but has built an Internet boat. The Internet boat will stop at villages along the Rajang River to teach basic Internet skills to prepare residents for permanent Internet access in the next few years.³⁴

As in Canada and the U.S., partnerships with business are a feature of access initiatives in other countries. For example, in Australia, Microsoft has partnered through its Empower Australia program to provide education, skills training and access for disadvantaged people. Working with non-profit partners, initiatives have been developed to provide access and training services in rural and urban areas, including local content development initiatives.³⁵

³³ *UK On-line – Annual Report*, September 2000.

³⁴ “Malaysian Internet Boat Surfs into Borneo”, digitaldivide@list.benton.org, December 7, 2000; “Malaysian government to set up 200 village Internet centers”, digitaldivide@list.benton.org, January 30, 2001.

³⁵ “Microsoft initiative for increasing Internet usage”, Press Release, digitaldivide@list.benton.org, December 6, 2000.

A number of countries (such as Japan, Sweden, Iceland and Ireland) recently announced broadband to the community or home initiatives. For example, Ireland's public/private partnership will extend broadband to towns and villages across the state. At the time of writing, Canada has established a Broadband Task Force to investigate options to extend affordable broadband to rural and remote areas.³⁶

Japan has announced a broadband to the home initiative and has also adopted a novel approach to IT literacy. To increase IT literacy, the public will receive vouchers for IT training. Japan lags behind Canada in Internet access. While nearly half of households have home computers, only three quarters of these have Internet access.³⁷

In summary, this overview has demonstrated that the diversity of initiatives being undertaken to address the digital divide are so numerous they are difficult to enumerate. But there are some clear lessons. While Canada is among the leaders in addressing the digital divide problem and is an example to others, at the same time there are gaps that need to be addressed. Many innovative approaches tried elsewhere may have relevancy to the Canadian context. As well, a review of international experience with the digital divide clearly demonstrates that something community-based initiatives share in common is the need for sustained, ongoing financial support. This support could be provided by a number of different means, including: government policy/programs; regulatory-based funds; and community support and partnerships. Most importantly, to be relevant to community needs (and therefore successful), these initiatives must be guided by local needs and involve community interests in decision making to be effective. The other important lesson is that there are no simple answers—the digital divide is very complex.

While there are similarities between the challenges facing Canada and the challenges of other countries (i.e., access, literacy, skills, employment opportunities, content, etc.), Canada, like the U.S., is able to respond to these challenges better than most countries. These advantages are due to greater technical and financial resources that are

³⁶ "State funding promotes e-commerce in regions", J. Smyth, *The Irish Times*, January 17, 2001.

³⁷ "Tokyo plans voucher for IT training", digitaldivide@list.benton.org, September 21, 2000; "Internet access rates still growing in Japan", digitaldivide@list.benton.org, October 13, 2000.

available, as well as to a better established base of physical, economic and social infrastructures. With these strengths, it is also evident that we share some of the same weaknesses, particularly the need to develop stronger social infrastructure and social literacy to benefit individuals and communities. Improved social infrastructure will help individuals and communities overcome some of the social and economic divides. Social infrastructure and social literacy (education, literacy, training, NGO support, community content, employment/skills training, learning content, etc.) are constituent components in realizing individual and societal participation and development.³⁸

³⁸ Sen, A. 1999, *Development as Freedom*, New York: Knopf.

7.0

Recommendations

Since early 2000, growth in access to the Internet has slowed in Canada. Access from home and elsewhere is showing signs of reaching a plateau for all socio-economic levels. While lower income Canadian households exhibited the greatest amount of growth in this period (40 per cent overall connected from somewhere, and 31 per cent from home), it is expected that access in this sub-group will now begin to plateau. If growth in different sub-groups does continue in the near term, it will be at a much slower pace than the previous three years.

At the end of 2000, those not connected from home comprised 49 per cent of the Canadian population. Cost/Affordability is the most important variable or obstacle to home Internet access. Lack of interest and need are also major factors for why people are not connected. Cost is a more important barrier to Internet access for those in the lower classes (the lower income bracket (<\$20k) and the lower middle income segment (\$20-39k)). There are also differential levels of access based on location (urban and rural areas), gender, education and age. Type of job has a bearing on whether individuals have an alternative means of Internet access to that at home. Literacy is also a barrier for many.

Digital Divide Concept

- ❖ The concept of the digital divide needs to be broadened to more appropriately incorporate the importance of the integration of ICT with other skills and activities in people's daily lives.

Attention to the Internet has been over-represented in the discussion of Canada as information society. Internet and computer access and competency are key constituents of successful participation in technology-based social and economic activities. However, these are linked to a broader complexity of important capabilities. Individuals need to be literate on several levels, including numeracy, prose, interpersonal communications, and technology, to function and be able to participate in the workplace and broader society, and to have the flexibility to continually adapt to change. In short, these skills are key components of social literacy. Social literacy

is the ability to use these skills to understand, function in, and contribute to society. In this broader view, the digital divide encompasses the ability of individuals, social organizations, businesses, and communities to effectively recognize change and opportunities in an information society, and to respond effectively, thereby participating in meaningful and successful ways.

Diversity of Means of Access

- ❖ With a substantial number of Canadians likely to remain unconnected for years to come, information and services need to be provided in a number of formats and means (for example, in person, by telephone, Internet, mail). The quality of service between these alternatives should be comparable so that those without Internet access do not become second-class citizens.

Public Awareness

- ❖ The federal government should work with community organizations to increase awareness by non-users of the availability of local access sites, and the services available. A substantial number of those not connected are not aware of local access sites and the range of services that they provide.

Publicly Relevant Content

- ❖ There is a need to create more Canadian content, particularly at the local level. Social, cultural and citizenship content needs to be created and made available in ways that meet the different needs and abilities of people. There is no shortage of commercial content, but there continues to be a lack of diverse and relevant information, particularly at the community level.
- ❖ Different levels of government should provide funding and other support for individuals and not-for-profit organizations that create social, cultural and citizenship content for general access and use in communities. This support should include the digitalization of components of these resources that are suitable for access and use on-line. Many groups, artists and others in society create a

broad, diverse inventory of content in Canada. People enjoy these resources through a number of venues and means of access (for example, live shows, print, etc.). This inventory can form the basis for on-line content, but needs to be supported in its initial creation, general distribution and access through traditional means, as well as digitalization of on-line access.

Sustainability of Public Access Sites

- ❖ There needs to be ongoing federal support for CAP sites across Canada. The role for these sites has changed since the inception of the program. Initially intended as an initiative to foster Internet awareness, access and market development, its incorporation by community interests into a broader set of community activities and services has meant that CAP now plays two very important roles. A number of CAPs act as public access sites for those who cannot afford or do not want access from home. This public service role will continue in the future. Secondly, other sites have been incorporated into, and support, a range of literacy, training, and development initiatives by community organizations. These services are intended for individual and community development. Individual and community development requires sustained support over a period of years to be successful. CAP sustainability funding will need to continue for several more years to ensure that the federal and community goals pertaining to individual and community access and development are achieved.
- ❖ A strategic approach to future CAP funding by Industry Canada should include:
 - Required service standards (for example, terms of access, minimum services provided, etc.) pertaining to public access. These standards should preclude fees for basic Internet access and training, because these are the major barriers affecting low income Canadians.
 - A review of the geographical location of CAP sites to ensure that these are appropriately located to accommodate the demographic groups with the greatest need and that are most likely to be unconnected.

- ❖ As part of this review, questions pertaining to home telephone, cable television, computer and Internet access should be included in the national census conducted by Statistics Canada. Community demographic analysis from this research should be made available at no cost to community organizations to assist them in planning appropriate locations for CAP sites. Using this and other local information, applicants for Industry Canada CAP sustainability funding or support from other government departments could, as part of their applications, provide an analysis on how local strategies will help address digital divide issues in their community.
- ❖ Industry Canada should explore the viability of establishing provincial-level not-for-profit Community Development Foundations. The purpose of these foundations would be to disseminate sustainability funding and other resources from Industry Canada and other sponsors to community organizations operating CAP sites. Membership for the foundations should be drawn from community organizations that operate or benefit from CAP services. Community organizations best understand the unique needs of their community. As such, they are more likely to be effective in awarding support than centralized national institutions acting alone. Funding and other support should be awarded to community-based not-for-profit applicants, using a merit-based application process. Experience to date has shown that an application process featuring competition between groups risks distorting support and services in a community. As well, such an approach can alienate interests in communities whose applications are rejected.
- ❖ There should be more involvement by the business community, locally and nationally, to support Internet access initiatives in Canada. While businesses in Canada have made some contributions, these efforts tend to lag behind the efforts of other countries, particularly the United States. Many of Canada's leading companies have yet to make significant contributions.

HRDC Roles for Individual and Community Capacity Development

- ❖ HRDC's Skills and Learning Agenda should address the digital divide issue as it is broadly conceived, as discussed in this report. HRDC should take a lead role in supporting programs and initiatives at the community level to address these challenges.
- ❖ A high level of demand by communities and individuals to meet basic developmental needs warrants the extension of the CLN program by HRDC. The CLN program can be used as a key community resource for the Skills and Learning Agenda. If the goals of the skills, training and access agendas are to lead to social inclusion, citizen engagement, skills portability and flexibility for individuals and, development opportunities for communities, then a range of community organizations and institutions, and businesses need to be involved. A broad-based, integrated community approach will facilitate the needs of service organizations, and address the wide range of needs of individuals. HRDC's CLN program is ideally suited to act as a catalyst to facilitate greater coordination and delivery of services at the community level. It is also a useful model that could help coordinate and link various federal resources and other forms of support for more effective access and use by community organizations.
- ❖ HRDC's CLN program should consider establishing Community Assistance Teams at the regional or provincial levels. These teams could help community organizations through sharing expertise on strategies and activities to address issues related to developing CLNs, access, training, partnerships, capacity development and resources. Such teams should be made up from a pool of individuals from community organizations in a province or region. These individuals should have had success and developed expertise in these different activities. To be effective, such teams would need to work closely with HRDC regional and national personnel.
- ❖ Funding support by HRDC should include providing communities with resources to undertake a reasonably sophisticated community and citizen needs assessments. To be successful, any development strategy, whether addressing the access divide, literacy and skills training,

or other forms of capacity development, should be founded on a needs assessment that considers a community's particular economic and social circumstances, and its citizens' abilities, challenges and opportunities. While many communities across Canada face similar obstacles and challenges, the opportunities and capacities for individuals and communities to respond to these vary greatly, depending on their social and economic contexts.

- ❖ There is a need for ongoing support for community organizations that provide access, skills, training, content development and related services to the public. This support should be separate from that provided for computers, access sites, networking and other ICT-related activities through the CAP and CLN programs. The ability to provide a range of services to the community, and to do so in an integrated way with other organizations, is contingent on the capabilities and resources of the organization. These include staff time, training, adequate general resources, and establishing realistic expectations on the part of administration, staff, volunteers and clients. Without proper resources and a needs-based approach, there is a risk that the services provided will be inappropriate and the intended beneficiaries of the programs, particularly equity groups, may become even more marginalized. This type of community level divide already exists across Canada. A critical factor in success is an ongoing support, both financial and other forms, for community organizations that provide the services. Support should be provided by a number of sponsors, including the federal and provincial governments, as well as other community level sponsors.

Other Possible Federal Government Roles

- ❖ Strategies and initiatives of the federal government and community organizations intended to close the various digital divides should include specific goals or objectives that can be measured using quantitative and qualitative methodologies (for example, number accessing computers and the Internet from home or public sites; increased literacy and skills levels for equity groups; increase in local employment for equity groups; changes in economic activities or social services in the community, etc.).
- ❖ There are roles for Ministers in the federal government to help create better public awareness about access, training and learning issues. A communication strategy should address such issues as: the importance and relevancy of life long learning; literacy; skills upgrading; and ICT skills. The message should convey how improvements in these areas are important for individual betterment and social and economic participation, as well as community and regional development. Coordination between federal departments may enhance such initiatives.
- ❖ There may be opportunities through communication regulation (*Telecommunication and Broadcasting Acts*) in Canada to help address some aspects of the digital divide. The federal government and the Canadian Radio-Television and Telecommunications Commission should consider the viability in Canada of such initiatives as:
 - A fund under the *Telecommunications Act* to address the issue of telephone affordability;
 - A fund under the *Telecommunications Act*, comparable to the United States' E-Rate initiative, that would provide connectivity and related operational cost assistance to not-for-profit community organizations providing access, training and content development services;
 - Regulation-based public benefits contributions from broadcasting and telecommunications companies involved in mergers and take-overs. As in the United States, the funds could be used by not-for-profit community organizations for activities related to closing the digital

divide, individual and community capacity development, and non-commercial social and cultural content development;

- Contributions by broadcasting distribution undertakings, broadcasting licensees, and Internet Service Providers, etc., to not-for-profit community organizations for activities related to closing the digital divide, individual and community capacity development, and non-commercial social and cultural content development.

APPENDIX A

Detailed Results and Tables from Regression Analysis

Detailed Results and Tables from Regression Analysis

The distribution of the dichotomous dependant variable (0, 1) presents a certain number of challenges when we try to apply a linear model. For one, the actual values of the dependant variable are limited to one of two choices. This would create a very strong bias in the distribution of the error term, thus violating the assumptions of a general least-square linear model which states that error terms have to be normally and independently distributed.

Instead, the likelihood of an event is expressed on a continuum, from complete certainty that the event did not occur to the complete certainty that it did. The two certainties are obviously hypothetical since we can never achieve complete statistical certainty, only an approximation within a certain interval of confidence. The likelihood is a product of individual contributions that represents the odds-ratio between two mutually exclusive possibilities: the event occurring (probability = p) and the event not occurring (probability = $1-p$). The distribution of p is an s-shaped non-linear curve, between zero and one. The odds ratio ranges from zero to + infinity. As p gets closer to one, the converse ($1-p$) gets closer to 0, drawing the likelihood estimate closer to + infinity. As p gets closer to zero and its converse closer to one, the limit of the likelihood approaches zero.

By taking the natural logarithm of the odds, we obtain a logit: $\ln(p/(1-p))$. The values of a logit range from – infinity (when $p = 0$) to + infinity (when $p = 1$).

A logistic regression refers to a linear function of a set of x independent variables:

$$L = b_0 + b_1x_1 + \dots + b_kx_k$$

where L is a logit, that is, $\ln(p/(1-p))$.

The obvious advantage is that L is a linear (additive) function.

Reversing the logit transformation allows us to examine the probability p that the event did occur:

$$p = 1 / (1+e^{-x}).$$

The following series of tables presents the results from the logistic regression analysis on Internet access in the past three months and Internet access at home, with the following key demographic characteristics as dependant variables: education, age, income, gender and location. Gender and location are both categorical variables (male/female and urban/rural).

These results have been transformed to reflect the exponential (e) base. If e^B is greater than one, then B is a positive value (as X increases, Y increases). A value of e^B that is between zero and one means B has a negative value (as X decreases, Y increases). If $e^B = 1$, $B = 0$ and there is no contribution from X on the value of Y.

Regression Models with Demographic Characteristics

In the first table (Table A1), Internet access in the past three months in the 1999 survey, shows a significant contribution from all five variables on the likelihood of Internet access. Income (most important factor overall), education, and an urban setting all have a positive effect. The generational effect is also quite significant, with younger respondents more likely to have had access to the Internet in the past three months. The gender gap also shows up as significant, with men having an increased likelihood of having had recent access to the Internet.

TABLE A1
Logistic Regression Table
Internet Access with Key Demographics

	In the past three months		At home	
	exp (B)	sig.	exp (B)	sig.
1999				
Education	1.3141	(+)	1.1822	(+)
Age	0.6542	(-)	0.806	(-)
Income	1.4115	(+)	1.4191	(+)
Sex	0.7412	(-)	0.7926	(-)
Rural	1.3076	(+)	1.1059	n.s.
2000				
Education	1.3218	(+)	1.2163	(+)
Age	0.5709	(-)	0.7085	(-)
Income	1.3794	(+)	1.4019	(+)
Sex	0.7722	(-)	0.6854	(-)
Rural	1.4195	(+)	1.2209	(+)
note: Sex and rural are categorical variables Sex: 0 = men; 1 = women Rural: 0 = rural; 1 = urban				

In the 2000 survey, the results show that the five key demographic characteristics remain in a very similar pattern. The urban/rural setting gains in importance over income and education (all positively correlated) while the age variable becomes increasingly important in determining the likelihood of recent on-line access (negative correlation).

The likelihood of having access to the Internet at home (a sub-sample of recent Internet users) reflects obvious similar patterns to the above-mentioned results. In 1999, however, the location (urban or rural) does not emerge as a significant predictor. It re-appears, nonetheless, in the results from the 2000 survey.

Regression Models with Employment Status

The results from the regression model that combines employment status with other key demographic characteristics are presented in Tables A2,

A3, A4 and A5. A full discussion on these findings is articulated in Chapter Four. The bottom line on employment status reveals that other characteristics, both complimentary and adjacent, are far more robust in determining the likelihood of Internet access either at home or elsewhere. While employment status and type are significant factors in the bivariate analysis of the level of access to the Internet, when other demographic characteristics are accounted for, employment status remains for the most part inconclusive.

TABLE A2a
Logistic Regression Table
Internet Access with Key Demographics and Others

	In the past three months		At home	
	exp (B)	sig.	exp (B)	sig.
1999				
Language	0.5049	(-)	0.4988	(-)
Emplment	0.9674	n.s.	0.8052	n.s.
Education	1.3113	(+)	1.1783	(+)
Age	0.64	(-)	0.7904	(-)
Income	1.3836	(+)	1.3868	(+)
Sex	0.7266	(-)	0.7839	(-)
Rural	1.2798	(+)	1.0813	n.s.
2000				
Language	0.593	(-)	0.6158	(-)
Emplment	0.6924	(-)	0.7724	n.s.
Education	1.3222	(+)	1.2168	(+)
Age	0.5649	(-)	0.7033	(-)
Income	1.3518	(+)	1.3786	(+)
Sex	0.7595	(-)	0.6735	(-)
Rural	1.4356	(+)	1.227	(+)
note: Language, employment, sex and rural are categorical variables; Language: English (0); French (1) Employment: other (0); unemployed (1) Sex: men (0); women (1) Rural: rural (0); urban (1)				

TABLE A3
Logistic Regression Table
Internet Access with Key Demographics and Others

	In the past three months		At home	
	exp (B)	sig.	exp (B)	sig.
1999				
Language	0.503	(-)	0.5023	(-)
Empliment	0.864	n.s.	1.0322	n.s.
Education	1.3109	(+)	1.1792	(+)
Age	0.6381	(-)	0.7922	(-)
Income	1.3827	(+)	1.3917	(+)
Sex	0.7369	(-)	0.7792	(-)
Rural	1.2797	(+)	1.0819	n.s.
2000				
Language	0.5974	(-)	0.6193	(-)
Empliment	1.0652	n.s.	1.0947	n.s.
Education	1.3226	(+)	1.2173	(+)
Age	0.5663	(-)	0.7053	(-)
Income	1.3588	(+)	1.3832	(+)
Sex	0.7547	(-)	0.6685	(-)
Rural	1.4344	(+)	1.2278	(+)
note: Language, employment, sex and rural are categorical variables Language: English (0); French (1) Employment: other (0); part (1) Sex: men (0); women (1) Rural: rural (0); urban (1)				

TABLE A4
Logistic Regression Table
Internet Access with Key Demographics and Others

	In the past three months		At home	
	exp (B)	sig.	exp (B)	sig.
1999				
Language	0.5037	(-)	0.5032	(-)
Emplment	1.1184	n.s.	0.8402	(-)
Education	1.3099	(+)	1.1826	(+)
Age	0.645	(-)	0.7825	(-)
Income	1.3726	(+)	1.4086	(+)
Sex	0.736	(-)	0.7654	(-)
Rural	1.2715	(+)	1.0926	n.s.
2000				
Language	0.5933	(-)	0.6213	(-)
Emplment	1.1717	n.s.	0.8165	(-)
Education	1.3204	(+)	1.2212	(+)
Age	0.572	(-)	0.6944	(-)
Income	1.3417	(+)	1.4042	(+)
Sex	0.767	(-)	0.6637	(-)
Rural	1.4268	(+)	1.2338	(+)
note: Language, employment, sex and rural are categorical variables Language: English (0); French (1) Employment: other (0); full (1) Sex: men (0); women (1) Rural: rural (0); urban (1)				

TABLE A5
Logistic Regression Table
Internet Access with Key Demographics and Others

	In the past three months		At home	
	exp (B)	sig.	exp (B)	sig.
1999				
Language	0.5066	(-)	0.5052	(-)
Emplment	1.1806	n.s.	1.6404	n.s.
Education	1.3115	(+)	1.179	(+)
Age	0.6395	(-)	0.788	(-)
Income	1.381	(+)	1.3823	(+)
Sex	0.7306	(-)	0.7954	(-)
Rural	1.2879	(+)	1.1003	n.s.
2000				
Language	0.5994	(-)	0.6261	(-)
Emplment	1.1683	n.s.	1.7208	(+)
Education	1.3227	(+)	1.2182	(+)
Age	0.5651	(-)	0.7003	(-)
Income	1.3549	(+)	1.3729	(+)
Sex	0.7654	(-)	0.6918	(-)
Rural	1.443	(+)	1.2574	(+)
note: Language, employment, sex and rural are categorical variables Language: English (0); French (1) Employment: other (0); self (1) Sex: men (0); women (1) Rural: rural (0); urban (1)				