Factors Affecting Home Internet Use in Central Queensland

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Abstract

This paper reports on a social survey that was conducted in 2001 in Central Queensland, Australia, in order to identify the disadvantaged groups in relation to accessing the Internet from home. The research found that people in younger age groups, with higher education levels, being married , having children at home, owning a house/flat, with the higher income level, or being employed, had higher levels of Internet access from home respectively, compared to their counterparts. Regression analysis found that variation of any factors of education levels, marital status, children at home, income level and employment status may affect the decision to access the Internet from home. It also found that unemployment and low education levels were two major factors detrimentally affecting home Internet access and that seniors (>55 years of age) were disadvantaged because of lack of awareness and capability to use the Internet.

Keywords: Community Informatics Systems, Internet access from home, consumer ICT behaviours, demographic and socio-economic factors

Introduction

The growth of computer and Internet connectivity within organizations not only makes for business without borders, but also improves productivity and communication/data exchange capacity and efficiency (Cronin 1996). Golden (1994) predicted that computers, networks and an advanced communications infrastructure would be widely used by business, government and finance to links countries and corporations, competitors and customers, into one global economy by 2000. This became true with the emergence of Internet banking, E-government and E-commerce services in developed countries/regions. According to Australian National Office for the Information Economy (NOIE 2002a, 6), Australia (55.7%) was ranked the third in the world in terms of the overall Information and Communications Technologies (ICT) index, behind only the United States (67.3) and Sweden (58.4) and ahead of Norway (53.3), New Zealand (52.8), Hong Kong (51.5), Singapore (51.1), South Korea (50.5), Taiwan (48.6), UK (46.5), Germany (45.4), Ireland (43.8), France (39.2) and Italy (38.0). However, it is one thing for Internet connectivity for government, business and finance, but another different thing for personal communications, education, information search and recreation. In September 2001, Sweden (56%), South Korea (56%), Hong Kong (54%), Singapore (54%), US (54%) and New Zealand (50%) were ranked the top six countries for Internet access rates from home personal computers (PC's). Australia and Taiwan were equally ranked 7th (49%) followed by UK (37%); Ireland (34%) and Germany (32) and France was the lowest, 18% (NOIE 2002a).

Nevertheless, the development of telecommunication and Internet systems in regional areas can

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and is increasingly being seen an important issue indication of development and equity within and across regions. Regional ICT infrastructure projects funded by Government in many developed countries, including Australia, determined that a priority needed to be given to ensure that people living in regional areas have the same opportunities to benefit from the information economy as their counterparts residing in major capital cities and metropolitan areas (NOIE 2002b). In doing this, the Australian Government acknowledged that the information economy can play a key role in contributing to the social wellbeing of regional and rural Australia. Access to the Internet from home in regional communities reflects not only infrastructural access but also the community's financial capacity and also personal capability necessary to use these emerging communication systems. The regional commercial use of ICT is heavily dependent upon not only business usage levels (the supply of ICT products and services) but also the wider community use (the demand for ICT products and services). ICT adoption patterns in areas that have reasonable access to ICT infrastructure may be reflected the demographic and socioeconomic profiles of the people residing in the region.

Although the Central Queensland (CQ) region, with approximate 141,936 km2 and 183,753 population up to June 2000 (Department of Local Government and Planning 2002) has had reasonable and growing access to ICT infrastructure over recent years, national surveys indicate that the home adoption of Internet is lower than the national average. The Central Queensland Social Survey (CQSS) has been jointly conducted by the Centre for Social Science Research (Mummery and Schofield 2001, 6) and the Community Informatics (COIN) Internet Academy, Central Queensland University in past three years (1999-2001). One of the subjects investigated in this annual survey has been the use of computers and the Internet at home. As one of a publication series, this paper aims to identify factors contributing to the adoption of ICT, particularly the Internet access from home in the CQ region. This analysis has a two-fold purpose. Firstly, to provide local/state governments and related industries accurate information for policy and decision making to promote Internet use for economic and social development, and secondly it provides the basis for targeted programs to reduce disparities between location, gender, and other demographic and socioeconomic groups within the region.

Methodology

Data Collection

The 2001 CQSS was administrated through the Computer-assisted Telephone Interviewing (CATI) system installed on a local area network at the Population Research Laboratory within the Centre for Social Science Research at CQU (Mummery and Schofield 2001).

Interviews were conducted from 9th to the 25th November 2001. The CATI program allowed the sample to reflect the socioeconomic profile of the region by identifying the proportion of socio economic subsets required. The question flowchart in Fig 1 demonstrates the framework for the interviews. The purpose of computer/Internet subset of the CQSS survey was to measure computer use and Internet access at homes in CQ and to identify the demographic and socioeconomic factors associated with the home use/non-use of computers or the Internet. Nine factors were identified and are as follows: geographic location, gender, age, education levels, marital status, children at home, dwelling ownership, combined family income and employment status.

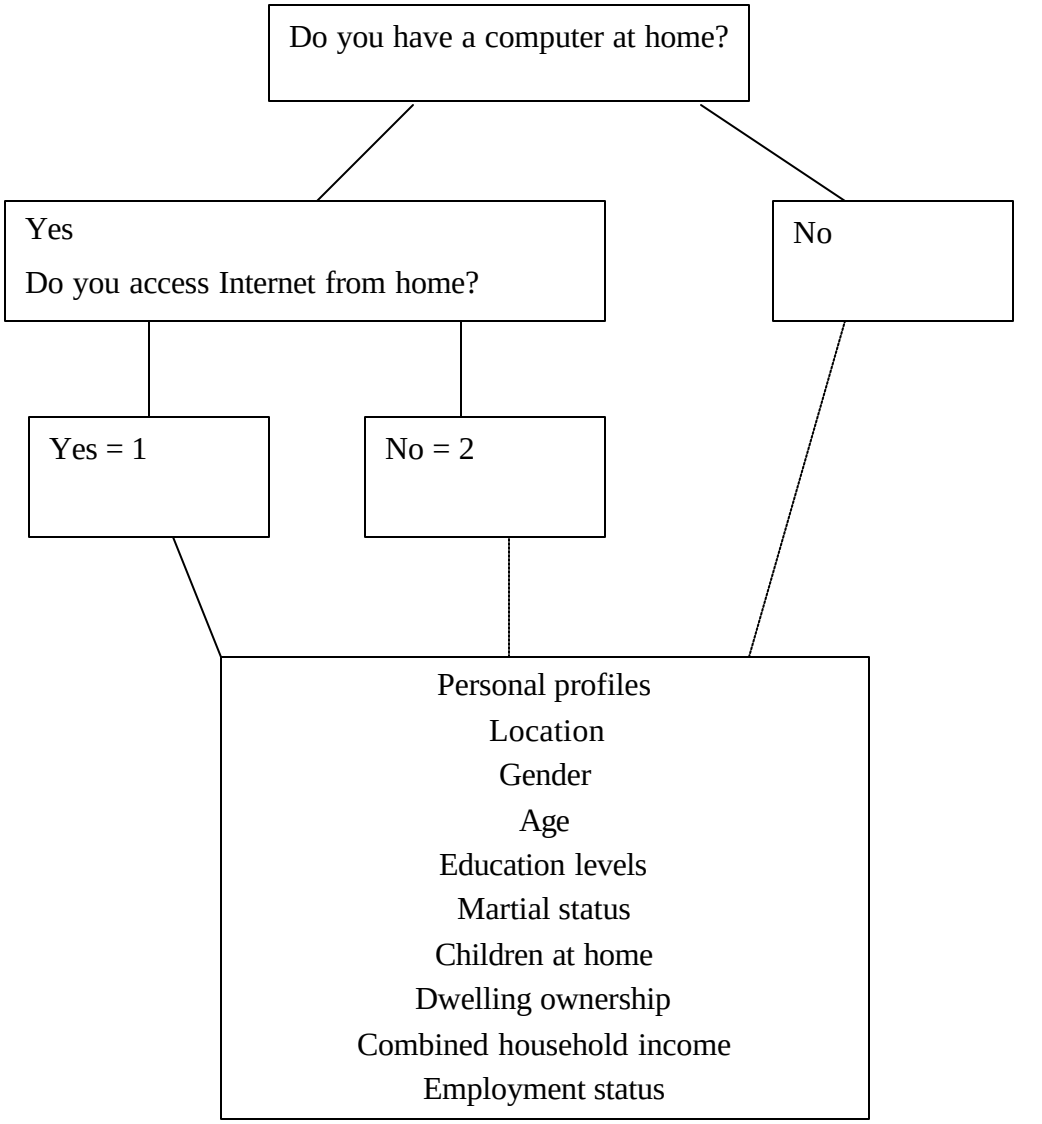

Figure 1. CQU 2001 computer/Internet use question flowchart

Data Analysis

This paper analysed demographic and social economic data only in relation to Internet access from home. The nine factors as mentioned-above were analysed individually re-categorised to facilitate our purpose of analysis (Table 1).

Table 1. Re-categorizations of personal profile surveyed

Factors	Categories	Remarks
Locations	Rockhampton, reminder of the region	
Gender	Male, female	
Age	18-24, 25-39, 40-55, >55	
Education levels	Primary, secondary, TAFE, Uni	
Martial status	Never married, used-to-be married#, married*	#Widow and divorced; *married and De Facto
Children at home	No children, at least one child	
Dwelling ownership	Rent, own house/flat	
Combined family income per week	<160, <160-399>, >400	
Employment status	Fully employed, semi-employed#, unemployed*	#Part-time and casual jobs; *incl. retired, pension, home duties.

As the data collected are nominal (frequency) data, nonparametric methods, including Binomial and Chi-square tests were employed to examine significant difference between two and three categories within a variable, and associations between pairs of variables (Kinnear and Gray 1998, 110), i.e., between a factor and the percentage of Internet access from home. However, using these methods for variables with more than two levels, create difficulties in identifying which category of a variable is significantly associated with other variables (the percentage of Internet access). Therefore, oneway ANOVA with Post Hoc Tests were also used to obtain the indicative differences between the categories of a variable.

Some factors are interrelated, such as age and marital status. Therefore, in order to exclude the interrelated factors that do not essentially affect a person's decision for home Internet access, Binary Logistic Regression with categorical covariates was applied to identify factors contributing to the percentage of Internet access from home. An Odds Ratio (OR) along with regression coefficient (Knoke and Bohrnstedt 1994, 180) was used to measure the weight of associations of each factor with the percentage of Internet access from home. An OR value of 1.00 indicates that two variables are unrelated; an OR>1.00, indicates the positive covariation of the variables (eg, age and the percentage of Internet access); an OR<1.00, it indicates the negative or inverse covariation. As our covariates (factors) are categorical, the first category of each factor was used as a reference (OR = 1.00) to detect the association of category variation (eg, from younger to older age groups) with the percentage of Internet access from home.

However, the logistic regression technique is not able to identify the interactions between two or more factors for the percentage of Internet access. Therefore, General Linear Model with Univariate analysis was used to identify any interactions among the factors. Then a general linear model could be established to conceptually quantify each factor and their interactions associated with the percentage of Internet access. For simplicity and convenience of interpretation, the interactions among the four factors were not considered.

Graphic demonstrations were used to explain the details of the interactions. However, before drawing the graphs, the mean values of the interactions (which were between 1 and 2; 1 = 100.0% and 2 = 0.0%, see Fig 1) and the related standard deviations from the Univariate analysis were transformed into the percentages according to its regression equation between the mean values of Univariate analysis and the corresponding percentage of Internet access obtained from Chi-Square tests.

Table 2. Binomial Test on computer and Internet access from home in Central Queensland

Computer or Internet at home	Category	N	Observed Prop. (%)	Asymp.Sig. (2-tailed)
Computer	Yes	768	64	<0.0001
	No	429	36	
Total		1197	100	
Internet	Yes	512	42	<0.0001
	No	704	58	
Total		1216	100	
Internet within those who have computer at home	Yes	512	80	<0.0001
	No	126	20	
Total		638	100	

Results

Overview

As can be seen from Table 2 that the overall computer use at home was 64%; home Internet access was 42% of the total population; and that 80%of those that had computers at home had Internet access.

Detailed Analysis within Each Factor Attributing to Internet Access from Home

As the proportion of Internet access from home accounts for 80% of computer users surveyed, it was considered that analysis of Internet access from home, would be representative of the computer users at home as well.

Of nine factors analysed, the variations of categories within each of seven (age, martial status, education levels, children at home, financial status, dwelling ownerships and employment status) were identified to be associated with Internet use from home. No significant associations were detected between the remaining two factors (location, and gender) and the Internet usage from home (data not present).

Age

Amongst the four age groups, the age cohorts of 18-24 and 25-39 had the highest percentage of Internet access from home, followed by those of 40-55 and over 55 in turn (Table 3).

As evident in Table 4, the younger age groups may have higher levels of education compared to their senor counterparts. The minimum education level of two younger groups surveyed was the Secondary

Table 3. Age groups associated with home Internet access

Age group	Within the group (%) #	N	Across groups (%)	Total no of the group	p
18-24	50.5a	48	9.4	95	<0.0001
25-39	55.0a	191	37.5	347	
40-55	47.0b	207	40.6	440	
>55	20.1c	64	12.5	318	
Total	42.5	510	100	1200	

level and these age cohorts had higher percentage of university education. Whereas senior age groups, especially the > 55 age cohort had 17.5 with primary education and the lowest proportion university

Table 4. Distributions (%) of education levels within each age group

	Education level				
Age group	Primary	Secondary	TAFE	Uni	p
18-24	0.0	40.0	26.3	33.7	<0.0001
25-39	0.0	44.6	24.3	31.0	
40-55	4.1	47.7	23.1	25.1	
>55	17.5	58.3	11.8	12.4	

education compared to other age groups (Table 4).

Education levels

The data in Table 5 indicates that people with higher education levels had higher percentage of Internet access from home. Within the TAFE/university education levels, over 50% of people surveyed had Internet access from their home, whereas at the primary education level, less 10% of those had home

Table 5. Education levels associated with the percentage of home Internet access

Education levels	Within the group (%)#	N	Across groups (%)	Total no of the group	p
Primary	9.6d	7	1.4	73	<0.0001
Secondary	31.7c	186	36.4	586	
TAFE	51.4b	127	24.9	247	
University	66.3a	191	37.4	288	
Total	42.8	511	100	1194	

percentages denoted with different characters indicate a significant difference at p< 0.05

Internet access.

Table 6. Martial status associated with the percentage of home Internet access

Marital status	Within the group (%)#	N	Across groups (%)	Total no of each group	p
Never married	44.6a	103	20.1	231	<0.0001
Used-to-be married	21.0b	42	8.2	200	
Married	48.0a	367	71.7	764	
Total	42.8	512	100	1195	

percentages denoted with different characters indicate a significant difference at p< 0.05

Marital status

The levels of home Internet access appeared to be affected by martial status as shown in Table 6 appears to be affected by the level of home Internet usage. It is of interest to note that the ‘never married’ and ‘married’ people tended to have higher proportion of Internet usage from their homes compared to those of the ‘used-to-be married’ group.

Table 7. Distribution (%) of age group within each category of martial status

	Age groups				
Marital status	18-24	25-39	40-55	>55	p
Never married	33.2	34.5	21.0	11.4	<0.0001
Used-to-be married	0.5	16.0	35.0	48.5	
Married	2.2	30.9	42.0	24.9	

Table 8. Distribution (%) of children at home within each category of martial status

Marital status	Children at home		
	No children	At least one child	p
Never married	77.0	23.0	<0.0001
Used-to-be married	76.0	24.0	
Married	48.4	51.6	

An explanation of this result is perhaps that younger people (18-39 age) who have high levels of home Internet access account for almost 68% are in the 'never married' category (Table 7), and the 'married' group tended to have children at home to use Internet services as shown in Table 8.

Children at home

The effect of having children less than 18 years of age at home or having no children at home on home

Table 9. Children at home associated with the percentage of home Internet access

Children at home	Within the group (%)	N	Across groups (%)	Total no of the group	p
No children	33.8	237	46.3	702	<0.0001
At least one child	55.4	275	53.7	496	
Total	42.7	512	100	1199	

Internet access is portrayed in Table 9. It indicates that 55.4% of families with at least one child at home had home Internet access. This is 64% higher than those without children (33.8%).

Table10. Dwelling ownership associated with the percent of home Internet access

Dwelling owner-ship	Within the group (%)	N	Across groups (%)	Total no of the group	p
Rent	39.1	107	22.0	274	<0.0001
Own house/flat	43.0	379	78.0	881	
Total	42.1	486	100	1155	

Table 11. Distributions (%) of family income per week within each category of dwelling status

Dwelling ownership	Income group			
	>400	160-399	<160	p
Rent	44.9	13.1	42.0	0.047
Own	53.1	10.0	36.9	

Dwelling ownership

Table 10 shows that residential property ownership in the CQ region affected home Internet usage. People who owned their dwelling properties had higher home Internet use compared to those who rented home dwellings.

However, this result may be associated with the financial status of residents, as shown in Table 11. People with lower income levels tended to have high percentage of home renting compared to those with higher income levels.

Combined household income per week

Table 12. Combined household incomes per week associated with home Internet access

Combined household income pw AUD$	Within the group (%)#	N	Across groups (%)	Total no of each group	p
<160	37.3b	174	34.0	466	<0.0001
160-399	16.5c	21	4.1	127	
>400	52.3a	317	61.9	606	
Total	42.7	512		1199	

percentages denoted with different characters indicate a significant difference at p< 0.05

The effect of financial status on home access to the Internet is depicted in Table 12. People within the middle range income have the lowest percentage of home Internet usage compared with those with the lowest and the highest income ranges.

Employment status

The effect of employment status on home Internet access is displayed in Table 13 and shows that only 25% the unemployed people had home Internet access, when compared to those who were semi- or fully employed (> 50%).

However, the unemployed people including ‘retired’, ‘pension’ and ‘home duties’ categories were more highly associated with higher aged groups as shown in Table 14. As a result, the percentage of the Internet access is lower for these age groups when compared to the employed people who tend to be younger

Table 13. Employment status associated with home Internet access

Employment status	Within the group (%)#	N	Across groups (%)	Total no of the group	p
Fully employed	54.2a	266	52.0	491	<0.0001
Semi-employed	52.9a	127	24.8	240	
Unemployed	24.5b	119	23.2	485	
Total	42.1	512	100	1216	

percentages denoted with different characters indicate a significant difference at p< 0.05

Table 14. Employment status associated with age groups

Employment status	Age group				
	18-24	25-39	40-55	>55	p
Fully employed	7.5	37.9	46.6	7.9	<0.0001
Semi-employed	15.1	29.3	41.4	14.2	
Unemployed	4.7	19.4	23.8	52.1	

(see Table 3).

Combined Factors Contributed to Internet Access from Home

Logistic Regression indicated that the five major factors (covariates) which contributed to home Internet

Table 15. Variables in the equation of the logistic regression

Variable	Category	Coef.	Odds ratio	Sig.	Overall Sig.
Kids at home	No children		1	<0.0001	<0.0001
	At least one child	0.6	1.832	<0.0001	
Employment status	Fully employed		1	<0.0001	<0.0001
	Semi-employed	-0.702	0.496	<0.0001	
	Unemployed	-0.584	0.558	0.002	
Family income ($/wk)	<160		1	0.019	0.014
	>160-399<	-0.165	0.848	0.260	
	>400	0.645	1.906	0.025	
Education level	Primary		1	<0.0001	<0.0001
	Secondary	2.421	11.253	<0.0001	
	TAFE	1.222	3.394	<0.0001	
	Uni	0.591	1.805	0.002	
Marital status	Never married		1	0.001	0.001
	Used-to-be married	0.187	1.206	0.308	
	Married	0.777	2.175	<0.0001	
Constant		-0.540	0.583	0.015	

access, were: (1) marriage status, (2) children at home, (3) income, (4) education levels and (5) employment status. Conversely, location, gender, dwelling ownership and age did not significantly contribute to home Internet access.

These various contributions are summarized in Table 15. The weights of positive/negative contributions to the Internet access can be portrayed with both coefficients of the regression and odds ratios based on the reference category of each factor. Examined in more detail, these results indicate that compared to 'no children at home', 'at least one child at home' was positively associated with Internet access from home and that when compared to 'fully employed persons', the 'semi- and un-employed persons' were less likely to connect Internet from home; (Table 15).

Further, this analysis demonstrated the interactions between two and three factors co-tributing to the percentage of Internet access from home. The two factor interactions were (1) Employment * age ($p = 0.02$) and (2) Employment * marriage ($p = 0.05$), and the three factor interaction was between employment * education * age ($p = 0.068$).

When the relative weight of these contributions (coefficients of regression) of each factor and their interactions to the Internet access was disregarded, a general linear model of Internet access from home could be conceptually established as follows:

*Internet access (%) from home = Constant + marriage status (M) + children home (K) + family income(F) + education levels (EL) + employment status (ES) + ES*age + ES*M + ES*EL*age+ error.*

It is worth noting that whilst the contribution of age groups alone to the level of home Internet access was not significant, its interactions with other factors were nevertheless closely associated with home

Internet access. The significant interactions between these two factors were demonstrated in Figures 2 and 3.

With the exception of those in the youngest group, the unemployed people across different age groups always had the lowest Interest access rates from home when compared to those fully and semi- employed (Fig 2).

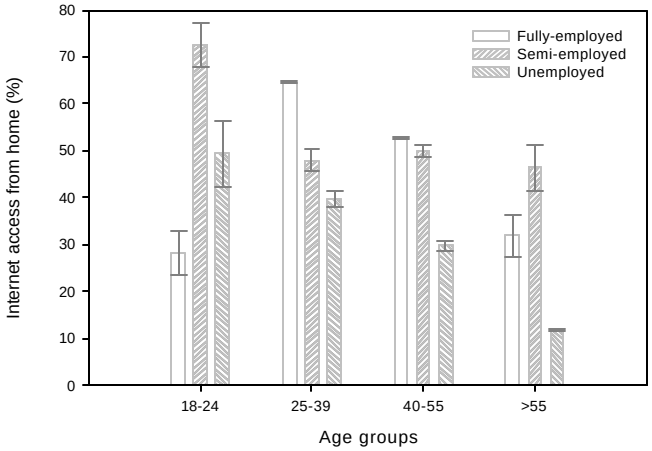

Figure 2. Interactions between age groups and employment status on home Internet access

The fully employed people within the youngest group had the lowest Internet access rate from home when compared to semi- and unemployed people within the same group (Fig.2). This may indicate that the former group had little leisure time to access Internet from home, or the nature of their job (such as outside, service industry or support) did not require them or did not provide peer pressure to access Internet from home for either leisure or career development. It could also be surmised that the later two groups (semi and unemployed) could be students who needed to access Internet from home for their educational needs.

Home Internet access within middle-range age cohorts (25-39, and 40-55) had strong associations with their employment status: the fully employed people had the highest percentages of Internet access, followed by the semi- and unemployed people in turn.

Figure 3. Interactions between martial status and employment status on home Internet access

The semi-employed people within the senior age group (>55) had the highest levels of Internet access compared to those of other two employment categories, indicating that these people may require Internet access from home either for job related communications with Internet (email) or recreation.

In similar fashion to the age factor, the 'unemployed' people had the lowest level of home Internet access across all levels of marital status (Fig. 3). However, it is noted that the 'fully employed' people within the 'used-to-be married' group did not have the highest home Internet access. Whilst speculation could point to issues of lower disposable income and increased social activity, the data does not provide a useful explanation for this finding.

People within younger age group (25-39), with higher education levels tended to use Internet at home more for purchasing on-line.

The analysis of the two-factor interactions indicated that employment dominated home Internet access almost across all age groups and marital status.

The three-factorial analyses found that across the youngest age cohort (18-24), education levels did not significantly affect home Internet access levels (Figs 4a and 4b) except for those who were unemployed (Fig. 4c). This was true even though the fully employed people may have overall lower percentage of Internet access as explained in Fig. 2. The lack of significant associations between educational level and home Internet access within this age group, indicated that the education levels were sufficient to use the Internet service provided, as all of them surveyed had at least secondary education level (see Table 4)

For other age cohorts, higher education levels (especially at university level) tended to a have higher level of Internet access; within age cohorts of 25-39 and 40-55, people with higher education and em-

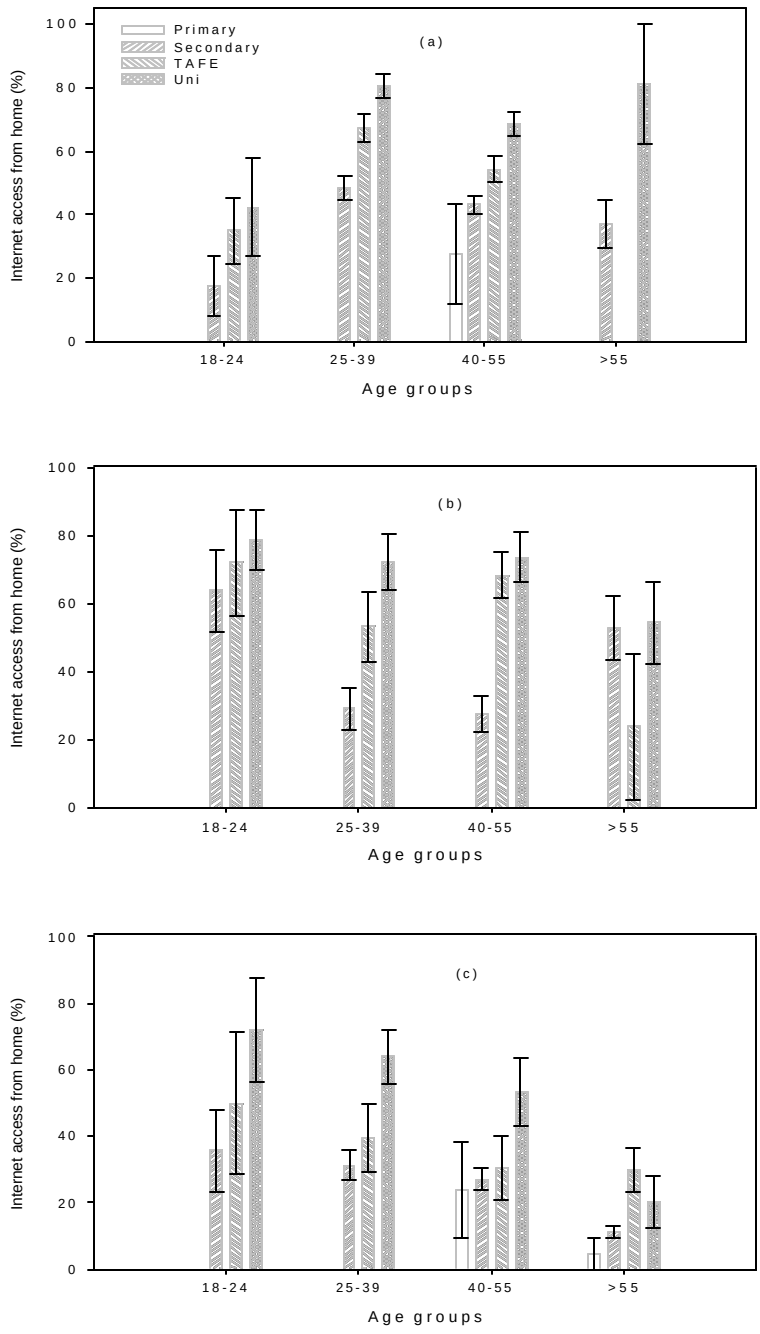

Figure 4. Internet access from home for people under the different conditions of age, education and employment status where (a) fully employed; (b) semi-employed and (c) unemployed.

ployed tended to have higher levels of home Internet access compared to those who were unemployed or had lower education levels.

People who were less educated, unemployed and older than 55 tended to have the lowest home Internet access (Fig. 4c).

Discussion

Disparities of Household Internet Access Between National and Regional Levels Within and Out of Australia

There were no detailed data available for 2001 from Australian Bureau of Statistics regarding the average national household Internet access rates with different demographic and socioeconomic profiles to be compared by those at the CQ regional level. However, the average household Internet access rate in CQ region in 2001 was only 42% (Table 2), 7% behind the overall national average which was 49% at the same period (NOIE 2002a). Statistical data show that this difference may just have emerged since 2001 (Table 16).

There is limited data available for household Internet access rates at regional/rural levels within and beyond Australia. Some comparative data for this period for New Zealand (Statistics New Zealand 2001), UK (National Statistics 2001) and the USA (NTIA 2001) is presented in Table 17. This indicates that the

Table 16. Comparisons of household Internet access rates (%) in metropolitans, other areas and regional CQ (data source: NOIE 2001 & Taylor 2002)

Region	1998	1999	2000	2001
Metropolitan areas	22.0	32.0	40.0	
Other areas	13.0	17.0	32.0	
National average	17.5	24.5	37.0	49.0
Rockhampton		28.4	37.1	43.6
Reminder of CQ		26.1	35.9	41.4
CQ average		23.5	36.1	42.1

Table 17. Comparisons of home Internet access for adults at national, metropolitan and regional levels in relation to their GDP per capita among the selected countries (The USA access rates were for those > 3 years old;

Country with GDP per capita ($US) in 2000	Data sources and date of data collected	National average (%)	Metropolitan (%)	Rural/Regional average (%)	Equality index between national average and region
Australia (20,200)	Nielsen/NetRatings September 2001	49	NA	42 (CQ)	93
New Zealand (13,000)	Statistics New Zealand (2001) March 2001	37	40	29	92
UK* (18,300)	National Statistics, UK (2001) September 2001	37	46.0	31	94
The USA (35,800)	NTIA (2001) September 2001	53.9	49.1	52.9	99

USA has not only the highest household Internet access rate, but also the highest equality of access index (EAI 99 points) compared to the rest of selected three countries which are similar in EAI. The differences in household Internet access rates and the EAI may be related to the GDP per capita (Statistics New Zealand 2002) for each of these countries. The data clearly shows that with the exception of the USA, regional and rural areas lag behind national home Internet adoption averages.

Continuously promoting the development of community Internet access is an imperative for local and state governments in order to encourage the region to catch up with the national levels for regional socioeconomic development. Internet consuming patterns may also reflect socioeconomic development for people residing within the region, such as just using the Internet for emailing or on-line education, or financial/business activities. These details will be elaborated in a separate report (Taylor et al. 2003a).

Disparities between locations of the region, genders, family incomes and age groups

One of the aims of this analysis was to identify the disadvantaged groups according to their demographic and social economic profiles in order to develop programs which will deliver equal opportunities of Internet access from home.

This analysis found no differences in home Internet access between people (43.4%) residing in regional city of Rockhampton and those (41.4%) in the reminder of the region, indicating that the infrastructure of telecommunication networks have been well established in CQ. In addition, as the employment is one of major factors affecting Internet access from home, the similarity ($p = 0.481$) of employment statuses between people (40.7% fully employed, 18.8% semi-employed and 40.5% unemployed) in rural areas of CQ and their counterparts (39.7%, 21.7% and 38.7%) in Rockhampton may lead to the similarity of the Internet access from home.

According to this analysis, women (40.6%) in CQ are not disadvantaged in home Internet access either compared to their men counterparts (43.6%). This is probably also due to the similarity ($p = 0.481$) of employment statuses between females (42.1% fully employed, 17.9% semi-employed and 40.1% unemployed) and males (38.7%, 21.6% and 39.7%) across the region. However, the EAI between genders (= 100-(43.6-40.6) = 97 points) in the region was still behind the national level (99 points), where 73% of adult (>16) males and 72% females had access the Internet (NOIE 2002a, 25). This placed Australian 1st for gender equity amongst the developed countries/regions. (Germany and Italy were the lowest ranked countries with 89 points, indicating a difference of 11% in access between genders).

It is interesting to note that combined family income was not always positively associated with home Internet access (Table 12) and that people with middle range of income level had the lowest percentage of home Internet access. This finding is similar to that concluded by Taylor (2002) in analysis of previously collected data in the 1999 and 2000 CQSS surveys. The higher levels of home Internet for lower income groups may indicate more available time, but it is worth noting that students were a high proportion of the lowest income level (Table 18). The lower home use of Internet by people within the middle

Table 18. Unemployment status associated with household income per week

	Income level (AU$/wk)			
Unemployment status	=400	160-399	<160	p
Working group, but unemployed	30.2	26.4	43.4	P<0.0001
Retired	25.6	21.2	53.2	
Student	26.9	11.5	61.5	
Home duties	53.3	9.3	37.4	
Pension	16.5	39.4	44.0	

range income level is difficult to explain from this data. However, it is possible to speculate that the nature of jobs in this income level may reflect a high proportion of jobs that do not use computers as a normal part of work and hence the levels of possible application, skill and knowledge were reduced in this group of people.

The analysis also indicates that the financial status might not be a limiting factor for people to use Internet from home. This disagrees with Australian governmental view (NOIE 2002c) that people with low incomes are less like to access the Internet. This might be due to the fact that people within the low range of income do not necessarily have a total income that is lower when compared to that of people within the middle range of income. People with income less than $160 per week may be still eligible for full family assistance or even unemployment benefits while those with income $166-$399 per week are not eligible for unemployment benefits and full family assistance. It is suspected that cost may also be a factor affecting access time, and the Internet usage volume will be presented in another report (Taylor et al. 2003b).

Along with the higher unemployment and lower education levels, people in older age groups were identified as the most disadvantaged group for home access to the Internet. This disadvantage may exacerbate loneliness and isolation, when compared to the younger counterparts whose mobility and use of communications technology may overcome these issues. In the USA, while 56% of all Americans go online, only 15% of Americans over the age 65 have access to the Internet (Fox 2001, 2). Therefore, there are opportunities for local/state governments to address the findings of this research to provide assistance in practical hands-on training and cheap Internet access from home for the older and less educated groups. However, this advantage may be confounded with the attitudes towards the use of Internet, such as wariness of usefulness and lack of interest in Internet access, which will be discussed in another report (Taylor et al. 2003c). Fox (2001) in work carried out in the USA reported that 81% and 56% of people who were over 55 and 65 respectively said they definitely would not go online.

Conclusion

These findings matched some of the findings by NOIE (2002c) that people on low incomes, without tertiary education, living in rural and remote areas, Aboriginal and Torres Strait Islanders, with disabilities, from non-English speaking backgrounds and aged over 55 are less likely to access the Internet. This research points to the need for a greater understanding of the interactions between the main factors in order to explain the non-linear responses. Further work also needs to be undertaken to examine the subsequent rapid uptake of Internet technologies by people in older age groups.

Further, as this analysis and other research by these authors is finding, the provision of access alone is insufficient to ensure that there is demand for ICT products and services in regional areas to counteract the bleeding of regional economies due to incremental adoption which favours centralisation both within and outside of nation states. Therefore, one of major tasks for researchers interested in issues of equity, governance and freedom of choice in civil society is to identify the barriers to adoption of ICT in areas of low use, particularly in regional and low socioeconomic urban areas in developed and developing countries. Further work addressing some of these aspects in Central Queensland is reported by Taylor et al. (2003c), where perceived financial, physical and psychological barriers for home Internet access amongst non-adopters is presented.

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