THE AUSTRALIAN NATIONAL UNIVERSITY

Bridging the Digital Divide: The Role of Community Online Access Centres in Indigenous Communities

A.E. Daly

DISCUSSION PAPER No. 273/2005

ISSN 1036 1774

ISBN 0 7315 5648 8

CENTRE FOR ABORIGINAL ECONOMIC POLICY RESEARCH

Series Note

The Centre for Aboriginal Economic Policy Research (CAEPR) was first established in March 1990 under an agreement between The Australian National University (ANU) and the Aboriginal and Torres Strait Islander Commission (ATSIC). Since 1 January 1999, CAEPR has operated as a University Centre and is funded from a variety of sources including the ANU, Australian Research Council, Aboriginal and Torres Strait Islander Services and the Department of Family and Community Services. CAEPR's principal objective is to undertake high-quality, independent research that will assist in furthering the social and economic development and empowerment of Aboriginal and Torres Strait Islander people.

CAEPR's aim is to be a world-class centre undertaking research on Indigenous economic development issues that combines academic excellence with policy relevance and realism. In Australia, CAEPR is currently the only dedicated research centre focusing on Indigenous economic policy issues from a national perspective. The Centre's publications, which include the CAEPR Discussion Paper series first established in 1991, aim to examine government policy, influence policy formulation, and inform public debate.

CAEPR Discussion Papers are intended as one forum for the rapid dissemination of peer-reviewed papers by Centre staff on relevant research topics. These papers are produced for widespread discussion and comment. Copies of most publications are available for free electronic download from CAEPR's website

<www.anu.edu.au/caepr/>

Printed copies can be purchased through the website or from:

The Centre for Aboriginal Economic Policy Research
Hanna Neumann Building #21
The Australian National University
Canberra ACT 0200

Telephone 02–6125 0587
Facsimile 02–6125 9730

Professor Jon Altman
Director, CAEPR
The Australian National University
April 2005

Cover page images courtesy of the Australian Institute of Aboriginal and Torres Strait Islander Studies and CAEPR staff members.

BRIDGING THE DIGITAL DIVIDE: THE ROLE OF COMMUNITY ONLINE ACCESS CENTRES IN INDIGENOUS COMMUNITIES

A.E. DALY

No. 273/2005

ISSN 1036 1774

ISBN 0 7315 5648 8

Anne Daly is an Associate Professor in Economics in the Division of Business Law and Information Sciences at the University of Canberra, and a Centre Associate of the Centre for Aboriginal Economic Policy Research at the Australian National University.

CONTENTS

TABLES

ABBREVIATIONS AND ACRONYMS

ABS	Australian Bureau of Statistics
ANU	The Australian National University
CAEPR	Centre for Aboriginal Economic Policy Research
CDEP	Community Development Employment Projects (scheme)
CTC	Community Technology Centre
CYDN	Cape York Digital Network
DCITA	Department of Communications, Information Technology and the Arts
NTN	Networking the Nation
RTI	Regional Telecommunications Inquiry
TAFE	(College/Institute of) Technical and Further Education
TAPRIC	*Telecommunications Action Plan for Remote Indigenous Communities*

ABSTRACT

This paper presents data from the 2001 Census of Population and Housing to highlight the low levels of computer and internet usage by Indigenous Australians. This result is not surprising given the well-documented connection between education, income, and use of these technologies. In addition to these demand-side factors, access will also be influenced by the availability of services and evidence shows that internet access is not as easy in remote areas as it is in urban centres. One possible way of addressing the digital divide between capital city dwellers and other Australians is through the development of community online access centres. Using evidence from the literature and from fieldwork in New South Wales, the paper considers some factors that are likely to make these centres more successful. These include a strong commitment by the community to the development of a centre and a close integration of the centre with community activities. It is also important that significant funds be budgeted to training for all involved including centre staff and community members.

ACKNOWLEDGMENTS

I would like to thank all the people who gave me their time during the fieldwork in New South Wales which is used as a basis for this discussion paper. I would also like to thank Jon Altman, Boyd Hunter and Diane Smith for useful comments on an earlier draft, Frances Morphy for copy editing and John Hughes for design and layout.

INTRODUCTION

The 2001 Census of Population and Housing was the first census to ask Australians about their access to computers and the internet. The results showed that while 30 per cent of non-Indigenous Australians had access to the internet at home, less than 10 per cent of Indigenous Australians did. Access was higher in the capital cities and surrounding areas and declined with distance from the major urban centres. Earlier research by Lloyd and Hellwig (2000) looked at the determinants of the take-up of the internet using data from the Australian Bureau of Statistics (ABS) and a survey of 700 households conducted by the KPMG Centre for Consumer Behaviour. They found that educational qualifications and income were the major determinants of access to the internet at home. It is therefore not surprising to find that Indigenous Australians have low levels of internet access at home. Education levels and income are lower for this group than for non-Indigenous Australians (Altman, Biddle & Hunter 2004). In addition, a larger proportion of Indigenous Australians than other Australians live outside the capital cities. Access to the internet has been less reliable and more costly in these areas than in the capital cities (Besley 2000, Regional Telecommunications Inquiry (RTI) 2002).

The purpose of this paper is to examine in more detail the census evidence on computer and internet usage for Indigenous Australians and to consider whether the development of community online access centres can help to bridge the digital divide between Indigenous and other Australians. The paper considers both Australian and overseas experience of the use of community online access centres in remote indigenous communities, highlighting the indicators of success and the limitations they have faced. It also uses evidence from fieldwork conducted in New South Wales on the development of community online access centres for Indigenous Australians.

CENSUS RESULTS ON COMPUTER AND INTERNET ACCESS FOR INDIGENOUS AUSTRALIANS

The 2001 Census provides a useful aggregate picture of home access to computers and the internet.[1] Several studies have used these data to investigate the implications of diffusion of these technologies for Indigenous Australians. Lloyd and Bill (2004) use these data to develop a model for explaining the determinants of home computer and internet usage. They found that Australians with higher levels of educational attainment and high incomes were more likely to access the internet at home than those less qualified and with lower incomes. Their results show that people with poor English language skills, Indigenous Australians and those living in a remote area were less likely to use a home computer or access the internet than their base case person.[2] While the probability of the base case person using a computer at home was 43.8 per cent, a person with identical characteristics, except that they were Indigenous, only had a probability of home computer usage of 20.3 per cent—a gap of 23.5 percentage points. There was also a substantial gap of 22.5 percentage points in the predicted probability of using the internet for a base case person compared with an Indigenous

Table 1. Proportion of Indigenous and non-Indigenous population that used a computer at home, by State, 2001

	Indigenous (1)	Non-Indigenous (2)	Ratio (1)/(2)
NSW	0.22	0.43	0.51
Vic	0.28	0.45	0.62
Qld	0.18	0.44	0.41
SA	0.17	0.42	0.40
WA	0.13	0.46	0.28
Tas	0.31	0.39	0.79
NT	0.06	0.43	0.14
ACT	0.41	0.59	0.69

Source: 2001 Census of Population and Housing.

Table 2. Proportion of Indigenous and non-Indigenous population, living in and outside capital cities, that used a computer at home, 2001

	Share of State		Computer users		
	Indigenous population (1)	Non-Indigenous population (2)	Indigenous (3)	Non-Indigenous (4)	Ratio (3)/(4)
Capital cities					
Sydney	0.32	0.63	0.29	0.46	0.63
Melbourne	0.48	0.72	0.33	0.47	0.70
Brisbane	0.24	0.46	0.28	0.48	0.58
Adelaide	0.47	0.74	0.24	0.44	0.55
Perth	0.34	0.74	0.21	0.48	0.44
Hobart	0.34	0.42	0.31	0.42	0.74
Darwin	0.19	0.64	0.18	0.44	0.41
Balance of State					
NSW	0.68	0.37	0.18	0.39	0.46
Vic	0.52	0.28	0.24	0.41	0.59
Qld	0.76	0.54	0.15	0.40	0.38
SA	0.53	0.26	0.11	0.38	0.29
WA	0.66	0.26	0.08	0.40	0.20
Tas	0.66	0.76	0.32	0.37	0.86
NT	0.81	0.36	0.03	0.41	0.07

Note: The ACT has been omitted, as less than one per cent of its population resides outside Canberra.

Source: 2001 Census of Population and Housing.

person with otherwise identical characteristics. According to Lloyd and Bill's results, being Indigenous was one of the most important negative determinants of computer and internet usage.

Biddle, Hunter and Schwab (2004) have used the census data on internet access to analyse Indigenous participation in education. Based on a detailed geographical analysis of that data, they found that access to the internet at home raised the probability of educational attendance. They interpreted this variable as an indicator of educational attainment in a household and support for educational participation. Their analysis shows substantial differences between Indigenous and other Australians in their access to the internet, particularly in remote areas.

Census data are used here to present a broad picture of computer and internet access. Tables 1 and 2 summarise the census evidence on access to a computer at home for Indigenous and non-Indigenous Australians for each of the Australian States and Territories.[3] Table 1 shows that the proportion of the total Indigenous population that used a computer at home was well below that for the non-Indigenous population in each State. The ACT had the highest proportion of computer users among both the Indigenous and non-Indigenous populations, but it was in Tasmania where the gap between the two groups was smallest. The two jurisdictions that stand out as having the lowest ratio of Indigenous to non-Indigenous computer users in the population were Western Australia and the Northern Territory. In each of these States the ratio of Indigenous users to non-Indigenous users was less than one-third.

Table 2 divides each State into its capital city and the remainder of the State. Columns 1 and 2 show the shares of the State's Indigenous and non-Indigenous populations living in and outside the capital city. The Australian Capital Territory has been omitted from this table as less than one per cent of its population lives outside Canberra. In each State, the share of the Indigenous population living outside the capital city was much larger than for the rest of the population. The division between those living in and outside capital cities is an important issue for internet access and usage and will be discussed further below. There was also a large gap in computer usage at home between Indigenous capital city dwellers and those living outside capital cities in these States.

Columns 3 and 4 show that use of a computer at home was higher in the capital cities than outside. While over 40 per cent of the non-Indigenous population in each capital city used a computer at home, the share of the Indigenous population using a computer was less than 20 per cent except in Melbourne and Hobart, where about one-third of the population had a computer at home. Computer usage was lower outside the capital cities in each State, but particularly so for the Indigenous population. The largest proportion of the Indigenous population outside the capital cities using a computer at home was in Tasmania at about one-third, but in the Northern Territory and Western Australia less than 10 per cent of the Indigenous population used a computer at home compared with about 40 per cent of the non-Indigenous population.

While about two-thirds of non-Indigenous Australians who used a computer at home also had access to the internet, the figure was closer to a half for Indigenous Australians. Outside the capital cities, this share was lower. Tables 3 and 4 focus on access to the internet at home for both Indigenous and non-Indigenous

Table 3. Proportion of Indigenous and non-Indigenous population that had access to the internet at home, by State, 2001

	Indigenous (1)	Non-Indigenous (2)	Ratio (1)/(2)
NSW	0.11	0.29	0.38
Vic	0.16	0.33	0.48
Qld	0.08	0.29	0.28
SA	0.07	0.27	0.26
WA	0.06	0.31	0.19
Tas	0.15	0.23	0.65
NT	0.03	0.29	0.10
ACT	0.24	0.41	0.59

Source: 2001 Census of Population and Housing.

Australians. As Table 3 shows, less than 10 per cent of the Indigenous population of Queensland, South Australia, Western Australia and the Northern Territory had internet access at home. The ratio for internet access at home was particularly low for Indigenous people in Western Australia and the Northern Territory compared with the non-Indigenous population.

The issue of the size and the importance of the digital divide has been widely debated. A significant dimension of this divide, as the figures in Table 4 show, is based on the location of residence, with those living in capital cities having greater access to computers and the internet than those in regional and remote Australia. There has been sufficient concern among policy makers over this issue to generate two recent Commonwealth Government enquiries into the state of communications systems outside the capital cities (Besley 2000; RTI 2002) and a report focusing directly on remote Indigenous communities, the *Telecommunications Action Plan for Remote Indigenous Communities* (TAPRIC) (Department of Communications, Information Technology and the Arts (DCITA) 2002). Since a much larger proportion of each State's Indigenous population lives outside the capital city than is the case for the non-Indigenous population (Table 2), any difficulties associated with accessing the internet outside the capital cities will have particular implications for the Indigenous population.

Table 4 shows that in Melbourne and Hobart the proportion of the Indigenous population with access to the internet at home was nearly 60 per cent of the non-Indigenous proportion, but in Perth and Darwin the ratio was less than one-third. Outside the capital cities, home internet access declined for all Australians. Only in Victoria and Tasmania did the proportion of the Indigenous population with internet access at home exceed 10 per cent. The proportion was particularly low, less than 5 per cent, in South Australia, Western Australia and the Northern Territory.

Table 4. Proportion of Indigenous and non-Indigenous population, living in and outside capital cities, that had access to the internet at home, 2001

	Indigenous (1)	Non-Indigenous (2)	Ratio (1)/(2)
Capital cities			
Sydney	0.16	0.33	0.48
Melbourne	0.19	0.32	0.59
Brisbane	0.15	0.33	0.45
Adelaide	0.11	0.29	0.38
Perth	0.10	0.33	0.30
Hobart	0.16	0.27	0.59
Darwin	0.09	0.30	0.30
Balance of State			
NSW	0.08	0.24	0.33
Vic	0.11	0.24	0.46
Qld	0.06	0.25	0.24
SA	0.04	0.21	0.19
WA	0.03	0.24	0.13
Tas	0.15	0.21	0.71
NT	0.01	0.27	0.04

Note: The ACT has been omitted, as less than one per cent of its population resides outside Canberra.

Source: 2001 Census of Population and Housing.

The 2001 Census asked people to state whether they used the internet at home, work or elsewhere and a range of combinations of these options. Tables 3 and 4 have been calculated by including all the options that included 'home' as indicating access to the internet at home. Tables 5 and 6 include all sources of access to the internet. This comprises the census categories 'home', 'work' and 'elsewhere' (for example schools, libraries, friends' homes, community online access centres). A comparison of Tables 3 and 5 and Tables 4 and 6 highlights some interesting results.

A comparison of the State data presented in Tables 3 and 5 shows that while Indigenous Australians were less likely to use the internet than other Australians, the gap was smaller if all usage of the internet was the focus rather than internet usage at home. A shift of focus from home usage to usage from all sources doubled the proportion of Indigenous people accessing the internet in South Australia, Western Australia and the Northern Territory, although from a very low base (see Tables 3 and 5, column 1). The increase in the share of users for the non-Indigenous population in these States was not proportionately as large when all internet usage was included, compared with home usage (see column 2).

Table 5: Proportion of Indigenous and non-Indigenous population that used the internet, by State, 2001

	Indigenous (1)	Non-Indigenous (2)	Ratio (1)/(2)
NSW	0.18	0.38	0.47
Vic	0.26	0.40	0.65
Qld	0.15	0.38	0.39
SA	0.17	0.37	0.46
WA	0.12	0.41	0.29
Tas	0.28	0.35	0.80
NT	0.07	0.42	0.17
ACT	0.40	0.57	0.70

Source: 2001 Census of Population and Housing.

A comparison of Tables 4 and 6 shows that the inclusion of other access points was particularly important outside the capital cities in Queensland, Western Australia, South Australia and the Northern Territory. The proportion of the Indigenous populations of South Australia and the Northern Territory who used the internet increased three times compared with the proportion with home access, although again the base was very low. Even after taking into account all possible sources of access to the internet, the figures show that the access of the Indigenous population remained well below that of other Australians. In Perth and Darwin the proportion of the Indigenous population using the internet was less than half that of the non-Indigenous population, and outside the capital cities of these States it was even lower.

The census data are now over three years old, and in this area of rapid change there has probably been substantial growth in computer and internet usage in the Australian population. Given certain characteristics of the Indigenous population—relatively low levels of educational attainment, low incomes, and location outside the capital cities—it seems likely that they continue to exhibit levels of computer and internet access below the national average.

POLICY RESPONSES TO THE DIGITAL DIVIDE

Policy makers have been concerned about the development of a digital divide based on location for some time. Given the large distances and sparse population, provision of effective telecommunications services in remote and rural Australia is unlikely to be a commercial proposition in an unregulated market. The Universal Service Obligation and Customer Service Guarantees are two Commonwealth Government policies designed to address the limitations of the market for telecommunications services delivered outside capital

Table 6: Proportion of Indigenous and non-Indigenous population, living in and outside capital cities, that used the internet, 2001

	Indigenous (1)	Non-Indigenous (2)	Ratio (1)/(2)
Capital Cities			
Sydney	0.25	0.43	0.58
Melbourne	0.31	0.43	0.72
Brisbane	0.24	0.43	0.56
Adelaide	0.22	0.39	0.56
Perth	0.19	0.43	0.44
Hobart	0.30	0.40	0.75
Darwin	0.19	0.43	0.44
Balance of State			
NSW	0.14	0.31	0.45
Vic	0.21	0.33	0.64
Qld	0.13	0.33	0.39
SA	0.12	0.30	0.40
WA	0.08	0.33	0.24
Tas	0.27	0.32	0.84
NT	0.04	0.40	0.10

Note: The ACT has been omitted, as less than one per cent of its population resides outside Canberra.

Source: 2001 Census of Population and Housing.

cities (Daly 2002). The government has also established a Digital Data Service Obligation that is designed to promote access to a basic digital service for all Australians.

Two inquiries into access to communications in remote and regional Australia have recommended additional expenditure to upgrade equipment and so ensure that Australians living outside the capital cities have services comparable to those provided for city dwellers. The Commonwealth Government has used revenue from the partial privatisation of Telstra to fund communications projects in remote and regional Australia through Networking the Nation (NTN). Almost 700 projects costing a total of $325 million have been funded under this scheme. It has included 60 projects worth $35.1 million of 'exclusive or significant benefit to Indigenous communities' (DCITA 2002: 26). One example is the Cape York Digital Network (CYDN), which has equipped 16 remote Indigenous communities on Cape York Peninsula with public internet and video-conferencing facilities .

Further measures designed to improve access to the internet outside the capital cities include Telstra's introduction of untimed local call access for all customers of its BigPond internet services in 2001. Although

the RTI (2002) concluded that there had been considerable improvement in access and reductions in prices for remote and regional internet users, the speed of access to the internet via fixed lines and the limited availability of broadband services remained issues for these users. The latter is of particular importance for the development of commercial uses of the internet, for example for the sale of arts and craft.

State governments also have programs designed to improve public access to the internet outside the capital cities. These include the Community Technology Centres (CTCs) in New South Wales (known as CTC@NSW), and the Western Australian telecentre program. These two programs are jointly funded by NTN and their respective State governments. They provide public access to computers, photocopiers, fax machines, the internet and video-conferencing in small rural and remote towns. Public libraries and schools in all States also offer public access to the internet in numerous locations.

Most of the programs and report recommendations are directed to all people living outside the major urban centres, but there have also been policies focused specifically on Indigenous communities. The RTI devoted a section of its report to a discussion of issues for remote Indigenous communities and concluded that such basic problems as a lack of access to public phones remained a significant issue in many communities. The Commonwealth Government has begun to address this problem through the Community Phone Subsidy Scheme, which subsidises the costs to communities of connecting community phone services, and the Community Phones Demonstration Program which supports trials of new products and systems (DCITA 2003). The RTI supported a holistic approach to improving services in these communities including support for training within the community and for call centre staff.

The TAPRIC report (DCITA 2002) included a full audit of communications facilities in discrete Indigenous communities as recorded in the Community Housing and Infrastructure Needs Survey conducted by the ABS in 1999. TAPRIC discussed some of the significant barriers to developing modern communications systems in these communities. They included cultural, social and economic factors such as poor and inadequate housing, and physical obstacles created by isolation and the harsh environment in which many of these communities exist.

One recommendation of these reports has been the need to further encourage the use of community facilities to promote access to computers and the internet in situations where private households are unlikely to pay for these services themselves. Remote Indigenous communities fall within this category. Residents have low incomes and low levels of education and technical expertise. The physical environment is harsh, making maintenance of the equipment difficult.

The following discussion of key factors which are important in making these centres successful is based on a reading of the literature and on fieldwork conducted in New South Wales in 2003. While Indigenous communities in New South Wales may not face the same issues of geographical isolation as those in other Australian States, they often face major problems of social and economic isolation. In Australia most of the centres have only been running for a short time, so an evaluation of their impact in their communities can only be partial.

THE ROLE OF COMMUNITY ONLINE ACCESS CENTRES

There are potentially many benefits for remote communities from access to computers and the internet. These technologies have the ability to increase access to goods and services, for example internet banking and health and education services, to facilitate access to information and assist in the preservation of local history and culture. There is also a negative side, where opening a community to the internet may increase the availability to residents of socially undesirable commodities such as pornography and online gambling. However, there are many examples of new technologies providing positive outcomes for remote communities (Daly 2002; Farr 2004).

Community online access centres are one way of bringing these services to remote communities and partially bridging the digital divide. These centres provide public multi-terminal access to information and communications technologies including the internet, e-business facilities, fax and photocopy machines, and video-conferencing.

In fieldwork undertaken by the author in 2003, visits were made to CTCs in Dubbo, Menindee and Wilcannia in New South Wales. Extensive discussions were held with the managers of these centres, members of the Indigenous communities, employees of Commonwealth and State government departments, the Outback Telecentre Network, the Far West Community Legal Service, Rural Doctors Network, the New England and Port Pirie TAFEs and the Far West Health Service. Some important factors in creating successful community online access centres were highlighted during this fieldwork, many of which are also discussed in the relevant literature. These factors are outlined below.

THE ROLE OF COMMUNITY SUPPORT

For these centres to be successful, it is important that community members are involved in their development from the initial stages of the project through to the ongoing operation of the centre. Several studies discussed by Farr (2004) emphasise the importance of local champions in establishing and maintaining local centres. Further examples include the CTC in Dubbo, run from a community centre providing a range of facilities for the local Indigenous population including health and education services. A management committee of community leaders oversaw the operations of the community centre and the CTC. In Cape York Peninsula the CYDN has been established through detailed partnership agreements with the Community Councils in each location.

THE DEVELOPMENT ROLE OF THE CENTRES

Related to the previous point is the need to recognise the role of online access centres in the development of communities. If they are to be successful, they need to be integrated into other activities in the community. It is important that centres engage in outreach activities to show how they can contribute to community life and development. For example, the development of radio and internet access has been used in the Torres

Strait to disseminate more accurate and detailed weather forecasts that are critical for fishing activity. In the CTCs visited in New South Wales, facilities were used for local meetings, educational purposes and for organising community transport. The Wilcannia CTC planned to establish a small local museum in the same building and a driver reviver centre to encourage passing tourists into the building.

There are currently very few Australian examples of a community online access centre that has been used as a base for a successful business enterprise. For example, the CTC at White Cliffs in New South Wales was successfully used as a call centre but was later closed down. Overseas examples demonstrate the importance of a skilled workforce in making these ventures successful (Farr 2004).

Schwab and Sutherland (2003) have proposed a similar role for schools as part of Indigenous learning communities at the centre of community activities. It is only by integrating these institutions with community life that they can offer real opportunities for people to enhance their skills and foster development in the communities.

LOCAL EMPLOYMENT AND TRAINING IN THE CENTRES

There are considerable difficulties in finding local people with the relevant skills to work in online access centres. It is important that ongoing training of community members is available in an attempt to build the skill base, and that centre managers are also given the opportunity to upgrade their skills. CTC@NSW and the Western Australia Telecentre Support Unit are examples of organisations that have some funds for manager training, but in general the budgets of these centres are very small and there is not much scope for training expenditure. The CTCs visited in New South Wales had not been very successful in their attempts to employ local Indigenous people in the centres. A major constraint has been the limited budget under which these centres were operating. In addition, many of the people who were available through the Community Development Employment Projects (CDEP) scheme or Work for the Dole were not suitably skilled and some of them were not acceptable for working with children for other reasons such as having a criminal record.

Community online access centres offer the opportunity to provide online training to groups in remote areas who might otherwise not have access to education services. TAFEs are now developing a range of online courses and are able to provide interactive education sessions to dispersed groups of students. One example from the Northern Territory is a pilot of virtual business education where participants establish virtual businesses and interact online to learn how to run a business. However, it is important that such courses recognise the existing levels of skills and the requirements of those they are planning to teach in order to be successful.

WHAT CAN THE CENTRES DO FOR YOUTH?

Young people are typically very keen computer and internet users and have been a primary focus of efforts to integrate online access centres into communities. While they may be interested in using the internet chiefly for entertainment rather than conventional education purposes, access to internet facilities can provide young people with reading and communication skills that they would otherwise not be acquiring.

An innovative example of the use of web technology for young Indigenous people is the dEadly mOb web site run from the Gap Youth Centre in Alice Springs (<**http://www.deadlymob.org**>). The site displays art work as well as information about youth activities in Alice Springs and surrounding communities. It also provides a mentoring service for young Indigenous people interested in gaining work experience.

The New South Wales CTCs have also focused on the needs of this group—examples include establishing homework clubs for students after school, a New South Wales-wide photo competition, and a healthy lifestyles video-conference between participants in communities and professional football players. A significant issue here is the importance of supervision. Several community leaders expressed concern that young people should only be able to access suitable web sites. Another important issue from the viewpoint of the financial sustainability of the online centres is that these young people are unlikely to have the income to pay for their use of the centres' facilities. There needs to be some way of cross-subsidising their access. One potential solution, access to large government contracts, is discussed in the next section.

USE FOR GOVERNMENT SERVICE DELIVERY

Several authors have argued that a way of making these centres financially viable is for them to establish contracts with government departments for the supply of services to remote communities. This idea is currently being explored in some detail. However, there are significant problems that must be overcome before community online access centres could be used to deliver many services. For example, to use a centre for a legal or health consultation via video-conferencing would require a secure network connection and the privacy of a separate room to ensure the confidentiality of the consultation. Most of the centres do not have these facilities. The CTC@NSW policy has been to undertake negotiations on behalf of all the CTCs in New South Wales with Commonwealth and State government departments. The agencies have been supportive of the proposals but are concerned about possible customer resistance to video-conferencing and the need to protect the privacy and security of the service. The potential for using income from these sources to cross-subsidise community activities remains a long-term objective.

TECHNICAL SUPPORT

The experience in New South Wales and Western Australia shows that it is very important that there is a strong centralised technical support network for the centres. The CYDN also runs a central support unit from Cairns that has regular contact with the community members. This support is necessary for dealing with

technical problems, brokerage with government agencies and as a source of new ideas. If the centres are going to be successful in remote communities, support information must be timely and available in a form that is accessible to people in the communities.

USE OF APPROPRIATE TECHNOLOGY

The technology available in these centres must be appropriate for the conditions and requirements of the communities. This includes social, cultural and economic constraints as well as physical ones. Supplying the most up-to-date technology may not lead to the best outcomes. For example, in each of the CTCs visited in New South Wales, there were video-conferencing facilities available at very reasonable rates by commercial standards. They were however, still too expensive for members of the local community and were under-utilised. Managers argued that most of the limited use that was made of this equipment was 'Sydney-driven' rather than initiated in the communities. Any equipment for these centres needs to be accompanied by a budget for training, operation, and maintenance. If the skills are not available in the community to keep the equipment operating successfully, then there is limited advantage in it being there.

LONG-TERM SUSTAINABILITY

Under many of these government-sponsored programs there is a goal of long-term financial independence for each centre. All the evidence of developments in Australia and in remote communities overseas suggests that this is unlikely to happen for a long time. The communities do not have the resources to make these centres financially self-supporting. In this context, the only way that the centres can be made self-supporting is if they can generate income from government or business sources to cross-subsidise community activities, for example, youth support programs. Current movement in this direction has been very slow.

In order to be sustainable in the long run, community online access centres must offer a range of services. One example from Canada is K-Net Services (<**http://www.services.knet.ca**>), a regional broadband network for First Nations which offers website and email hosting, network services, video-conferencing and website and graphic design. On a less sophisticated level this may involve running a café as well as a set of computer terminals. Centres seem to perform better where they are integrated with other key organisations in a community, for example, the health centre, the library and the school.

CONCLUSION

This paper has presented the evidence from the 2001 Census on computer and internet access for Indigenous Australians. It shows that access to computers is well below that for other Australians, particularly in Western Australia and the Northern Territory. Home internet access is even more limited for Indigenous Australians, with less than 10 per cent of the population having access to the internet at home. The data presented show that there are significant differences between the capital cities and other areas in each State, with much lower home computer and internet access outside the capital cities. The census evidence confirms a digital divide between Indigenous and other Australians.

One way of trying to bridge this divide is by the development of community online access centres. While the development of these centres is at an early stage in Australia, there are some factors that appear to be associated with likely success. It is important that the community actively supports the introduction of a centre and is closely involved with its development and management. Centres should take a developmental role in their community and focus on ways in which they can contribute to the future of the community. The centre management must be actively involved in outreach activities to show residents how they can benefit from using the facilities. The centres can have a special role in developing the skills of young people in the community and expanding opportunities.

A lack of appropriate skills among the local population is likely to be a significant issue in developing these centres in remote Indigenous communities. It is imperative that there is a budget available for training and upgrading skills and that the management has ready access to support from outside the community.

However, there are important underlying reasons why the introduction of a community online access centre can only be expected to have a limited effect in many communities. Low levels of income and education will reduce the advantages that people can reap from access to new technologies. These underlying factors are of paramount significance in addressing the long-term disadvantage of Indigenous Australians.

NOTES

1. Other surveys conducted by ABS collect information on computer and internet access for households but do not include an Indigenous identifier; see for example ABS (2003).
2. The base case person is a married man aged 25–44 years with no postsecondary qualification but not currently studying, employed in an occupation other than trades and labouring, with household income of $500–$999 per week, no dependent children, English-speaking, non-Indigenous and living in a major city in New South Wales.
3. For ease of exposition the term 'State' will be used as a shorthand for 'States and Territories' throughout this paper.

REFERENCES

Altman, J.C., Biddle, N. and Hunter, B. 2004. 'Indigenous socioeconomic change 1971–2001: a historical perspective', *CAEPR Discussion Paper No. 266*, CAEPR, ANU, Canberra.

Australian Bureau of Statistics (ABS) 2003. *Household Use of Information Technology*, Cat. no. 8146.0, ABS, Canberra.

Besley, T. (Chair) 2000. *Connecting Australia, Report of the Telecommunications Service Inquiry*, available at <**http://www.dcita.gov.au**>, consulted April 2001.

Biddle, N., Hunter, B.H. and Schwab, R. 2004. 'Mapping Indigenous educational participation', *CAEPR Discussion Paper No. 267*, CAEPR, ANU, Canberra.

Daly, A. 2002. 'Telecommunications services in rural and remote Indigenous communities in Australia', *Economic Papers*, 21 (1): 18–31.

Department of Communications, Information Technology and the Arts (DCITA) 2002. *Telecommunications Action Plan for Remote Indigenous Communities*, available at <**http://www.dcita.gov.au**>, consulted April 2003.

—— 2003. 'Community phones program', available at <**http://www.dcita.gov.au**>, consulted September 2004.

Farr, P. 2004. 'Achieving sustainability and "triple bottom line" outcomes for community online access centres', paper delivered to the International Telecommunications Society 15th Biennial Conference, Sept 5–7 2004, Berlin.

Lloyd, R. and Bill, A. 2004. *Australia Online: How Australians Are Using Computers and the Internet*, Australian Census Analytic Program, ABS, Canberra.

—— and Hellwig, O. 2000. 'The digital divide', *Agenda*, 17 (4): 345–58.

Regional Telecommunications Inquiry (RTI) 2002. *Connecting Regional Australia: The Report of the Regional Telecommunications Inquiry*, available at <**http://www.dcita.gov.au**>, consulted September 2004.

Schwab, R. G. and Sutherland, D. 2003. 'Indigenous learning communities: a vehicle for community empowerment and capacity development', *Learning Communities: International Journal of Learning in Social Contexts*, 1 (1): 53–70.