The Digital Divide and Gender: A Survey of Environmental Community Organizations' Leaders in Perth, Western Australia

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Abstract

The digital divide is generally considered to be the lack of capability to adopt and effectively utilize Communication Technologies (ICT). Although the need of building ICT capability of community organizations been increasingly emphasized in recent years, the gender dimensions of digital divide amongst leade organizations remain unexplored. This paper responds to this gap and explores the trend of ICT a Environmental Community Organizations (ECOs) in Western Australia with a gender lens. The findings fron ECOs indicated that benefits and barriers associated with ICT adoption significantly differed according to genc Drawing on the survey findings, the paper concludes by discussing why gender matters in overcoming the makes recommendation for further research.

Introduction

Community organizations have been increasingly recognized as integral part of the civil society or the n addressing social, economic and environmental concerns at the grassroots level (Smith 2000, Anheier 2005). there has been a growing emphasis on pragmatic as well as policy level initiatives to enable these organiz from the effective utilization of Information and Communication Technologies (ICTs), such as, email and w (2000) refers to these initiatives as Community Informatics (CI) – 'an approach concerned with enhancing strengthening local communities for self management and for environmental and economically sustainal ensuring that many who might otherwise be excluded are able to take advantage of the enormous oppo technologies are presenting' (p. 2).

It is apparent from Gurstein's description that CI aspires to overcome the notion of digital divide – a sym disadvantage of those who either are unable or unwilling to make use of ICTs (Cullen 2001). Although the divide is an outcome of categorical inequalities in society that, if unaddressed, is likely to reinforce the exi even further (van Dijk 2005), the digital divide typically reflects on the lack of capability to access as well as effectively utilize ICTs due to various socioeconomic factors such as age, education, gender, and income Hargittai 2002, Gurstein 2003, Korrup & Szydlik 2005). For instance, mature women (above 55) in Australia a to have access to the Internet compared to men in a same age group at the household level (ABS 2007).

With the rise in availability and access to ICTs in recent years, several studies in developed countries h implications of ICT uptake amongst community organizations (Weare et al 2005, Pinho and Macedo 2006, Ha 2007). Although systematic studies of this nature are lacking (DiMaggio et al 2001), it is argued that commun are generally not the leaders in ICT uptake (Johnson 1999, Kirshenbaum and Kunamneni 2002, Kvasny Overcoming barriers to ICT uptake/access amongst community organizations has therefore become a n countries like Australia (Gregor et al 2004, DCITA 2005a, DCITA 2005b, CISA 2007).

This paper concerns a distinct set of community organizations in Australia that are primarily involved in prote environment. These community organizations are referred to as Environmental Community Organizations (ECO functioning of ECOs is based on the notion and practice of volunteering where community members provide towards activities like restoration and management of local bushland and wetlands. ECOs generally ope members/volunteers/paid staff and have limited funds to support their activities (Dhakal 2009) compared to larger environmental organizations such as Greenpeace or the World Wildlife Fund for Nature. Nonethel

amongst the first community organisations to experiment with ICT uptake in Australia. The National Landcare University of Melbourne jointly experimented with the computer network project called 'LandcareNet' in t (Hawkins et al 1992, Campbell 1994). The project was initiated after the need for better social interact realised amongst ECOs, mainly Landcare and Catchment groups. However, in an era prior to the Internet revol resources as well as skills ultimately led to the downfall of LandcareNet (Curnow 1996). The trend of acces and uptake of ICTs amongst ECOs has been noticeably missing from the literature since then. Obviously, altho of women led ECOs outnumbers those led by men, at least in Perth (Dhakal 2009), gender dimensions tow amongst ECO and community organizations in general remain unexplored.

This paper describes the preliminary findings of a survey developed to gain broader understanding of the trend barriers to ICTs adoption amongst ECOs in Perth (the state capital of Western Australia) with a gender lens. with an overview of a discussion on gender and digital divide. The paper then describes the survey summarizes the key findings prior to making concluding remarks.

Gender and Digital Divide

Before exploring gender dimensions of the digital divide, it is necessary to comprehend differences between Gender differs from sex because sex refers to the anatomical and physiological difference between men and gender refers to behaviours resulting from socializations (West and Zimmerman 1987, Duerst-Lahti and Ke issue of access to and uptake of ICTs is entwined with the gender differences (Kole 2001), the need of ackr differences is crucial to overcome the digital divide. Bimber (2000) observed that men and women do adopt IC the gender gap in terms of ICT utilization is determined by the combination of gender and socioeconomic fa gender exclusively. Due to socialization process, women may undermine their capabilities, and as a result, adopt ICT. Hargittai and Shafer (2006) reported that men and women do not necessarily differ in their IC women's self assessed skills were significantly lower than that of men. That is why, although gender gap in te ICT has been narrowed in developed countries, concern over gender differences should not necessarily be si Zavodny 2003).

In Australia, the latest census data on access to the Internet does not indicate gender gap at the household le However, information on access to the Internet alone does not reveal the benefits associated with ac importantly, barriers to access. A closer scrutiny of ABS (2007) data reveals that mature women (above 55) have access to the Internet compared to men in a same age group at the household level. This gap is significa of ECOs in Perth because the majority of leaders are mature women (Dhakal 2009). It might well be that the moved beyond the binary divide of the haves and have-nots (Gunkel 2003, Kennedy et al 2003, Warscha difficult, if not impossible, to make a case for gender in ICT strategies without gender specific data on have (Hafkin 2003). Targeting women with limited access to ICTs or skills to adopt ICT is one of the ways to ensu strategies that promote gender equality (Gurumurthy 2006). This paper asserts that comprehending gender way leaders access and adopt ICTs are valuable in overcoming digital divide amongst ECOs and o organizations.

Methodology

Research Questions

Building on a few studies about ICT and community organizations that exist in Australia (ACOSS 1996, I survey was constructed to gain broader understanding of the trend, benefits of and barriers to ICT adoption the Perth region of Western Australia (WA), with the following Research Questions (RQ):

> *RQ1: Is there a gender gap in terms of access to and adoption of ICTs?*
>
> *RQ2: Will the perceived benefits from ICTs differ according to gender?*
>
> *RQ3: Are the barriers to ICTs adoption gender-specific?*

Study area

The Perth region in WA is spread over an area of 770,000 hectares which includes Perth metropolitan area wit about 1.5 million (SCC 2004). It is estimated that there are about 400 active ECOs in the region, either es through local community commitment to a particular local environmental issue or as a result of encourage agencies to provide more formal representative groups covering catchments and neighbourhoods (O'Byrne 2(comprehensive list of ECOs (other than an out-of-date directory published by Swan River Trust in 1996) d conservation directory maintained by Swan Catchment Council (recently renamed as Perth Region NRM) liste 150 community organizations in the region and their contact details (retrieved October http://www.swancouncil.org.au). Based on the names of community organizations, such as, catchment wetlands, coastcare association, and etcetera, a total of 116 organizations in the list were identified as ECOs each organization was requested to participate in the survey.

Survey instrument and data analysis

The self administered postal survey entitled 'ICTs and ECOs' was conducted from June to August in 2008. The Method (TDM) was utilized to design and disseminate the survey instrument. TDM (Dillman 2000) incorpor elements, namely; 1) respondent friendly language and design/layout of the questionnaire, 2) four contact letter (two weeks prior to mailing the actual survey), b) cover letter and the survey questionnaire itself, c) rem weeks later), and d) thank you letter (for ECOs that returned the survey), 3) postage paid return envelopes correspondence, and finally, 5) financial incentives for the leaders as a token of appreciation for completing a

survey.

The survey instrument contained a total of 25 (mostly close ended) questions with a provision (at the end) for to make comments or suggestions. The survey aimed to collect information about:

- Access to the Internet and take-up of ICTs (email, email listserv, blog, website, instant messenç videoconference)
- Pattern of intra-organizational (between leaders and members) and inter-organizational (with partn environmental networks, peak environmental bodies, and government agencies) interactions
- Various modes (face to face, postal, landline/fax, mobile/sms and email) of intra-organizational and int interactions
- Perceived benefits of ICT uptake towards; accessing/disseminating information, publicizing local environ recruiting members/volunteers, raising funds, and supplementing existing ways of interactions
- Factors that compromise the ability to benefit from ICT uptake; high cost, lack of financial support, support, lack of skills, and other organizations not using ICT.

A total of 83 responses were received, of which 81 were complete and usable (a response rate of 68.9%). Tl was in line with a desirable rate of 50% or above for the nonprofit organizations (Hager et al 2003). In ord research questions, descriptive statistics, frequencies, cross-tabulations, correlations and tests of statistical carried out.

Findings

Almost two-thirds (65.4%) of respondents were female leaders. More than three-quarter of the respondent years of age (male 34.5% and female 48.2%). More number of female leaders had higher level of educati than male leaders. Nearly two-third of male (64.3%) and female (64.2%) leaders had been in the same leader more than 4 years. On average, ECOs had been functioning for 14.2 years, had 73.3 members, 37.1 voluntee 0.5 staff. However, nearly 63% and 56% of ECOs reported of having less than 20 members and 20 volunteers.

Is there a gender gap in terms of access to and adoption of ICTs?

The majority of leaders (87.7%) indicated that their organization had access to the Internet and reported However, less than one-third organizations had websites and less than one-tenth organizations posted blogs Table 1, none of the leaders indicated the use of videoconferencing or podcasting. Although more ECOs wit reported of having websites and using mobile phone/sms, no significant gender specific differences were d terms of access to the Internet or uptake of various ICTs.

Table 1: Trend of ICTs Adoption in % (n = 81, m = 28, f = 53)

ICTs	*Male*	*Female*	*Overall*
Access to the Internet	92.9	84.9	87.7
Using Email	89.3	86.8	87.7
Hosting Website	28.6	32.1	30.9
Subscribing to Listservs	32.1	20.8	25.7
Using Mobile/SMS	21.4	22.6	22.2
Using Instant Messengers	21.4	5.7	11.1

Posting Blogs	10.7	5.7	7.4
Podcasting	0.0	0.0	0.0
Videoconferencing	0.0	0.0	0.0

Further exploration of the website adoption revealed that a) 10 leaders (5 male and 5 female) were organizational websites up and running in the near future, and b) 13 out of 25 leaders (9 female and 4 mal websites were hosted through other organizations. Interestingly, one female leader reported of having website (hosted through other organizations) but indicated lack of access to the Internet.

Mode of Interactions

The survey collected data on various modes of intra-organizational (within ECOs) and inter-organizational (be other organizations) interactions. During the data entry process, it was noticed that while most leaders used n interactions, a handful number of leaders reported of using only email. Hence, a separate category of 'only e for the data analysis.

As depicted in Figure 1, email was the preferred mode of intra-organizational and inter-organizational interactic leaders. Interestingly, about a quarter of the male leaders reported using 'only email' to interact with environm and peak environmental bodies.

On the contrary, 'face to face' was the preferred mode of intra-organizational interactions and 'email' was the for inter-organizational interactions for female leaders (Figure 2).

Similar to male leaders, about a quarter of female leaders interacted with environmental networks us Interestingly, one female leader (between 60 – 70 years of age) indicated that she no longer used email bec connection issues. As a result, her frequency of interactions with other organizations declined considerably sin of email.

Will the perceived benefits from ICTs differ according to gender?

The survey collected data on whether leaders agreed/disagreed about the potential benefits of ICT up organizational contexts (Table 2). The responses were rated according to the Likert scale ranging from strongl strongly agree (4).

Table 2: Mann-Whitney U tests between Gender and Benefits of ICTs

ICTs Help To:

Gender (M=28, F=53)	*Access / Disseminate Information*	*Publicize Local Environmental Concerns*	*Raise Funds through Additional Means*	*Recruit Members / Volunteers*	*Supplement Other Ways of Interactions*
Mean Rank Male	42.25	41.64	49.29	40.34	51.73
Mean Rank Female	40.34	40.66	36.62	41.35	35.33
z	-0.385	-0.19	-2.45	-0.191	-3.089
p	0.7	0.85	0.014*	0.848	0.002*

* $p \leq 0.05$

As indicated in Table 2, Mann-Whitney *U* tests (nonparametric t-test) detected two significant differences ir perceived benefits of ICTs between male and female leaders. Male leaders perceived of ICT being significantly (in terms of raising funds and supplementing interactions) than female leaders.

Are the barriers to ICTs adoption gender-specific?

The survey collected data on whether the ability to fully benefit from ICTs was compromised by any factc skills and etcetera. The majority of male leaders (70.8%) indicated other organizations not using ICTs a whereas the majority of female leaders indicated the lack of skills (66.7%) and the lack of technical support barriers. As indicated in Table 3, Chi square tests detected significant gender differences ($p \leq 0.05$) in three barriers.

Interestingly, one of the female leader (between 60 - 70 years of age) commented that lack of free or low become skilled in upgrading brochures and PowerPoint presentations was the main barrier.

Table 3: Barriers to ICTs Adoption

	Response	*Male*	*Female*	*Total*
High cost				
$x^2(n=75) = 0.517$ df=1, p=0.472	No	17 (70.8%)	40 (78.4%)	57 (76.0%)
	Yes	7 (29.2%)	11 (21.6%)	18 (24.0%)
	Total	24 (100%)	51 (100%)	75 (100%)

Lack of financial support

	No	21 (87.5%)	49 (96.1%)	68 (90.7%)
x^2(n=75) = 1.930 df=1, p=0.165	Yes	3 (12.5%)	2 (3.9%)	7 (9.3%)
	Total	24 (100%)	51 (100%)	75 (100%)

Lack of technical support

	No	19 (79.2%)	28 (54.9%)	47 (62.7%)
x^2 (n=75) = 4.107 df=1, p=0.043*	Yes	5 (20.8%)	23 (45.1%)	28 (37.3%)
	Total	24 (100%)	51 (100%)	75 (100%)

Lack of skills

	No	16 (66.7%)	16 (31.4%)	32 (42.7%)
x^2 (n=75) = 8.311, df=1, p=0.004*	Yes	8 (33.3%)	35 (68.6%)	43 (57.3%)
	Total	24 (100%)	51 (100%)	75 (100%)

Other organizations not using ICTs

	No	7 (29.2%)	39 (76.5%)	46 (61.3%)
x^2 (n=75) = 15.399, df=1, p=0.000*	Yes	17 (70.8%)	12 (23.5%)	29 (38.7%)
	Total	24 (100%)	51 (100%)	75 (100%)

It is also noteworthy to mention here that more than 90% of the leaders did not consider the lack of ICT support as a barrier. Similarly, 76% of the leaders did not consider high cost associated with ICT uptake addition, 37 leaders reported other types of barriers (Table 4), of which, more than one-third members/volunteers either not having computers and access to the Internet or lacking skills.

Table 4: Other barriers to ICTs adoption (n=37)

Nature of barriers	*Male (%)*	*Female (%)*	*% of Total*
Lack of time (design, learn, cater request, upload, manage)	2 (25%)	6 (75%)	21.6%
Members/volunteers lack access to the Internet	4 (75%)	2 (25%)	16.2%
Members/volunteers don't have computers	4 (80%)	1 (20%)	13.6%
No need of ICTs (F2F or Postal or Phone is better)	1 (25%)	3 (75%)	10.8%
Not interested in ICTs (other priorities)	2 (50%)	2 (50%)	10.8%
Members/volunteers with ICT skills not available	2 (67%)	1 (33%)	8.1%
Speed of Internet connection	2 (100%)	0	5.4%
Lack of low cost ICT related education	0	2 (100%)	5.4%
Age (we are not teenagers)	0	1 (100%)	2.7%
Can't afford high speed Internet connection	1(100%)	0	2.7%
Impracticality (Tried but no longer using ICTs)	0	1 (100%)	2.7%
Total	*18 (48.6%)*	*19(51.4%)*	*37 (100%)*

Conclusions

The general trend of access to the Internet and uptake of ICT like website amongst community organizations continuously improved over the years. The 1996 survey conducted by Australian Council of Social Service (A 209 community organizations indicated 38% had access to the Internet, 36% used email and 14% had w 1996). Whereas the 2002 survey conducted by Centre for Community Networking research (CCNR) amongs organizations revealed that 90% had access to the Internet and 61% had websites (Denison 2003). By that st Perth are lagging behind, especially, in terms of website uptake (30.9%). The finding is also consistent accepted notion that Australian community organizations are not considered the leaders in ICT uptake (Johns 2005a, Denison and Johanson 2007). Since ACOSS and CCNR surveys did not focus on the gender speci leaders, appropriate comparison was not possible. However, the fact that no significant gender differences terms of access to the Internet as well as ICTs uptake resonates with the overall national trend in Australia suggests that ICT related gender inequality (in terms of access to the Internet) may have narrowed in recent Tranter 2006).

The lack of significant differences in email usage between male and female leaders supports the finding of Richmond-Abbott (2005) but disputes the finding of Boneva and Kraut (2002). Intra-organizational interactions leaders revealed that usage of email had superseded face to face mode of interactions. Perhaps, it partially ex male leaders perceived of ICT being beneficial towards supplementing ways of interactions compared to fem finding is of particular significance because as Truong et al (1993) pointed out, perceived benefits can be more the ICT itself. Consequently, female leaders might not bother to build their ICT skills, if they do not see ICT (Bratteteig and Verne 1997). The aggregate pattern of email based organizational interactions supports the vie more useful tool than websites for smaller community organizations (Hart et al 2005).

The significant differences in terms of various barriers to the adoption of ICTs indicate that more fema technical support and skills enhancement opportunities than male leaders.

This finding is consistent with the viewpoint that the skills to utilize ICT are more important than physi (Manzo and Pitkin 2007). Moreover, no reported use of podcasting and videoconferencing imply that comp nature of ICT may compromise the ability of smaller community organizations to adopt newer ICTs (Merk addition, the lack of perceived benefits associated with the newer ICTs may have actually resulted in the avoida

The fact that the majority of leaders didn't consider 'high cost' and the 'lack of financial support' as barrie implies that the focus on ICT specific financial assistance as a strategy to overcome digital divide (McNu inappropriate in the context of ECOs. Instead, a strategy that concentrates on building skills of not only leader as male) but also of the members/volunteers affiliated with organizations (where possible) may be more releva of ECOs. Some of the other reported barriers to ICT uptake reflect on the complexities within the notion of line with the assertion of van Dijk (2005), gender differences in terms of level of motivation (other priorities) v to brush-up skills (not enough opportunities), have-nots (cannot afford) versus want-nots (not necessary), an but no longer using ICTs) versus evaders (lack of time or interest) were also evident from the survey findings.

Revisiting the research questions, it is clear that except for access to the Internet and uptake of ICTs (email, w mattered in how leaders perceived benefits associated with ICTs and the barriers to benefit from ICT uptak differences will be increasingly important, as the leaders of community organizations need to build capabilit utilize ICT. Depending on the scope of organizational objectives and activities, it might well be the case that not be necessary for every ECO, and more importantly, male and female leaders certainly do not have to hav of access to ICT and utilization skills. However, as ICT become increasingly ubiquitous in an organizational con ECOs that are either not able to or not willing to keep up with the ICT could be at risk (if not already) isolation, and consequently, might reinforce already existing gender inequalities further. Although the explorato paper was limited in scope, the findings did provide a glimpse of ICTs uptake amongst ECOs in Perth. In-dep the nature of technical support needed and the purpose of ICT uptake in the future can provide useful overcoming the gender dimensions of digital divide amongst ECOs. Not because women leaders are less capa utilizing ICTs but because women leaders could better make use of ICT skills to further organizational objective

Acknowledgements

This research was conducted within the Australasian CRC for Interaction Design (ACID), which is establishe under the Australian Government's Cooperative Research Centres Program.

The author is thankful to Dr. Ian Barns and Dr. Ingrid Richardson of Murdoch University for their incessant gui research and the leaders of Environmental Community Organizations who kindly participated in the survey.

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