

Social networks, social capital, and the use of information technology in the urban village: A study of community groups in Manchester, England^①

Kate WILLIAMS*

Graduate School of Library and Information Science, University of Illinois
at Urbana-Champaign, Urbana IL 61801, USA.

Received Mar. 9, 2011
Revised May 24, 2011
Accepted Jun. 2, 2011

Abstract Underresourced or socially excluded communities in Manchester, England demonstrate active use of information technologies despite continuing digital inequalities. A systematic look at 31 grassroots community groups, at how they use IT and who helps them, reveals possible mechanisms towards a more inclusive network society. Social network and social capital theories help make apparent how people are self-organizing with respect to information technology in ways that reach across ethnicity, class, gender, and generations for skilled help, yet stay close to their strong-tie, bonding-social-capital networks, relying largely on people in their own communities. Based on 25 measures of IT use, the groups fall into three progressively more extensive categories: Downloaders (using computers and the Internet, particularly e-mails), uploaders (maintaining a group web presence), and cyberorganizers (helping others to become uploaders or downloaders). These categories align with each individual group's purpose.

Keywords Social network, Information technology, Social capital theory

1 Introduction

The method of this paper helps move the emerging field of community informatics beyond the case study by analyzing a sample of 31 community groups and their 62 IT helpers. Empirical proof is provided via statistical tests on closed-end responses along with narratives extracted from interviews. Policy (in public libraries and beyond) would benefit from taking into account the relatively invisible but active networks within socially excluded communities.

^① This research was supported by the Manchester Digital Development Agency, the University of Manchester Ahmed Iqbal Race Relations Resource Center, the University of Michigan Non-Profit and Public Management Center and the Alliance for Community Technology. Generous help also came from Bernard Leach and Gary Copitch. A PhD dissertation reporting the work in more detail is available at <http://deepblue.lib.umich.edu/handle/2027.42/39370>

* E-mail: katewill@illinois.edu



A study was carried out in socially excluded communities in Manchester, England. This British term expresses the multidimensional nature of poverty—lack of access to jobs, income, education, services—and emphasizes the agency of those doing the excluding, i.e. withholding provision of resources. This term arose after Thatcherism had expressly deprived many communities of customary resources. In response, research and policy used this term to measure, understand, and reverse the phenomenon^[1].

The context for the study can be expressed in several assumptions. First, the wellbeing of each member of a society is a condition for the wellbeing of all. Second, the use of information technologies is the very much part of this wellbeing and this is substantiated by daily practice as well as by research. This has become true over the 17 years since the Internet became a mass medium supporting job-seeking, work, education, a sense of belonging in a community, and also even for keeping in touch with one's family. Everyday participation in modern culture—our daily collective use of email, mobile phones, Wikipedia, and a host of so many other digital resources—depends on access and use of information technology.

The UK national government took various initiatives to enable universal use of computers and the Internet; just one, UK Online, began in 2000 and now supports 3,500 public computing access and training sites.

The third assumption is that no one can use digital tools without help. The tech-savvy are often the first to acknowledge this. When faced with IT roadblocks or breakdowns, they readily consult online communities, knowledge bases, and with one another. Governments, universities, corporations all have large IT support organizations. In the US, the federal cyberinfrastructure initiative included funding to educate and train those who help people use that cyberinfrastructure^[2]. Families, if they are lucky, have at least one member who usually solves everyone else's computer problems.

These three assumptions underpin the question that was investigated: How do people without apparent tech support manage to use IT, and where do they turn for help? As we will see, this question has implications for both research and policy.

2 Theory building

The study is located at the intersection of three fields of literature. The first two, social networks and social capital, are useful here for their theory and their methodology. The third, community informatics, is a newer field which contributes case studies that point towards the questions the study addresses. These three fields of literature help in constructing the model or framework for the study: That our social ties (independent variable) influence our use of IT (dependent variable).



Social network theory examines the ties between people (or between organizations) as the basic building block of society. Ties are built up as two people share experiences and resources over time. Many ties make up a social network. Granovetter^[3-4] proposed the Strength of Weak Ties theory which states that weak ties tend to be those between sub-networks in society and thus are sources of new information. Wellman and Wortley^[5] and Lin^[6] asserted that we turn to our strong ties (strong and weak being relative terms) for social support. Lin^[6] is also among those who found that people at the bottom of our hierarchical societies are generally “encapsulated,” surrounded by strong ties, without weak ties from which they might obtain such resources as new information. Moving into studies of the information society^[7-9], digital inequality is seen as not only a matter of people having access to technology but includes a number of factors including social support, that is, other people in their social network using IT and helping them. Taking all these findings together allows for a reformulation of the research question: In excluded communities, where statistics project some but fewer users of IT, do people get help in using IT from their strong ties or from weak ties?

Lin^[6] has clarified the relationship between social network theory and social capital theory, defining social capital as those resources that we obtain via our social networks. Coleman^[10], who galvanized recent work in this area, studied strong tie networks such as multigenerational merchant families in an Egyptian bazaar and Catholic school communities in the US. He asserted the importance of resources you get from strong ties, in other words, bonding social capital.

Robert Putnam^[11] characterized Americans as “bowling alone” rather than in organized leagues in his book of that title, which reported his analysis of many datasets and sounded an alarm that American society was fraying. Putnam’s central argument is: In the United States, people have largely stopped maintaining their weak social ties. These ties are the human connections that link various sub-networks in the U.S.A. So the social capital that used to flow across the human bridges that connect those sub-networks is in precipitous decline—bridging social capital. Again reading Lin^[6] and others, we understand that bonding social capital has been found useful in maintaining resources and bridging social capital in bringing us new resources. Using these ideas^[6,11] in particular, we can rephrase the research question: Is it bonding or bridging social capital that is helping people who are at the bottom of the social pyramid use IT?

Community informatics^[12] includes close to two dozen studies that examine the interaction between social ties and IT use^[13]. Two of these studies^[14,15] found that IT use and social ties build upon each other in a “virtuous circle,” so that IT can strengthen a community. Three of the studies^[16-18] discovered instances where IT



use in a community suffered from not engaging the existing strong ties, the bonding social capital. Alkalimat and Williams^[19] examine a community-serving IT facility and find that its sustainability has depended on its being firmly embedded in strong tie networks who invest their bonding social capital in the facility.

3 Study design

At the most abstract level, the study is designed to examine how historical continuity influences transformation. At this moment in human history, it is important to know how certain aspects of the local, historical community influence that community's use of information technology. The study models a community as a social network and asks two overarching questions: How does your group use IT? Where does your group turn for help with IT?

Unlike most other community informatics studies which focus on one IT project or on a set of individuals in a community, the unit of analysis in this study is the grassroots community group. This is a community group that is volunteer-driven, with no or few paid staff. Such groups operate almost invisibly, yet are key nodes in local social networks. Their work involves maintaining or improving the local community, usually over a long time horizon. So this study emphasizes community-centered goals over individual goals. It intersects with the social inclusion agenda which addresses the challenge of ameliorating entire communities, rather than improving prospects for individuals who may then leave the community with its problems unchanged.

Table 1 summarizes how the study operationalized key concepts, borrowing from Granovetter^[3], Lin^[6], and McPherson et al.^[20] for the social capital and social

Table 1 Operationalization of concepts

Concept	Indicators	Examples of questions
Bonding/bridging social capital	Ethnicity	What is your ancestry? What is the ancestry of the person who helps you?
	Geography	How far away does the person who helps you live?
Strong/weak ties	Frequency of contact	How often do you see the person who helps you?
	Type of relationship	Is he or she your family, friend, workmate, or acquaintance?
	Degree of intimacy	Have you invited him or her over, or <i>vice versa</i> ?
Group ICT use	Technology narratives	How does the group use technology?
	Specific ICT activities	Does the group "carry out a given ICT activity" often, sometimes, rarely, or never?
Sociocultural context	For the community group: Purpose, origins	What does the group do? How did the group start?
	For the community group volunteer: Education, work	How far did you go in school? What is or was your occupation?



network measurements. Bonding social capital tends to be shared between people from the same ethnic group and the same locale. Strong ties are measured by frequency of contact, type of relationship, and degree of intimacy. Reflecting a multi-dimensional approach, information on group IT use was collected from narratives emerging from open ended questions and from answers to a set of closed-ended questions. Information about the socio-cultural context of the model included information about the particularity of each group and the demographics of the study participant, an informed member of the group.

The data was collected via 40- to 90-minute interviews with representatives of 31 community groups known to use information technology. These individuals served as proxies for their groups and were knowledgeable about how their group used technology. The groups were identified in background interviews with local community experts and especially through the assistance of the Manchester Community Information Network (MCIN), a community-serving technology organization with a decade of service across the city.[®] Snowball sampling enabled the study to include groups which are not highly visible, even to large agencies like MCIN. Data was analyzed using hand coding, basic statistics, and social network analysis.

Manchester was a desirable site for the study for several reasons. First, it has a concentration of England's most socially excluded areas. Second, like the US sites studied by the author, it relies on a Rust-Belt economy that is retooling around digital technologies. And third, as the birthplace of the industrial revolution, it holds particular interest for future work comparing grassroots activity in two different technological leaps.

More recently, it was Mancunians who built the world's first stored-program computer in 1948, and the city has demonstrated a culture of information technology innovation including a series of experiments in local communities. For instance, Manchester Host was the first email network for trade unions and other civil society organizations in the UK. And the city established its own governmental unit devoted to what it calls 'digital development.'

4 Findings

The first finding is that each of these 31 community groups has a particular purpose that can be used to sort them into three categories. Tenant associations look after the interests of tenants with regard to housing and neighborhood conditions.

[®] Still in operation as of 2012, MCIN is now known as People's Voice Media.



Research Papers

Cultural organizations focus on neighborhood journalism, local history, landmarks, parks, annual community service awards, ethnic news, cultural preservation, political activism, recycling, or training youth in digital music. Social support organizations attend to the needs of immigrants, people with a particular medical condition, old people, young mothers, and/or children. With names and details changed to preserve privacy, here are three examples of each type:

- Poplar Walk Tenants Association agitates with city agencies for housing maintenance and solutions to sidewalk threats, trash pileups, and car thefts. They are 10-12 people living in a housing development.
- Barstow Local Historians meets weekly at their branch library, and has produced monographs, audios, and videos of their memories and historical research.
- Inshallah Center advises and supports immigrant families, wins local reforms, runs programs for youth, women, and others in several languages, with one paid staff person, the founder.

IT use by the organizations was measured in two ways. First, answers to twenty-five closed-ended questions yielded a ranked list of what the 31 groups did with computers or the Internet. Creating documents, using e-mails, and looking for information online were nearly universal. Talking or texting on a mobile phone, taking digital photos, sharing photos or other media and using spreadsheets were typical activities. A minority of the groups engaged in the other activities listed in Table 2 below.[®]

What is more, combining these questions with the narrative data revealed three types of IT use. Some groups were what the study identified as downloaders. This means they used the Web as an information source, sent and received email and made documents on local computers. These groups were heavy printers of information. Others were uploaders. This means their primary activity was putting information up on the Web, maintaining group websites. A third category of groups were cyberorganizers. They helped others become downloaders and uploaders. These three groups showed a pattern in the breadth of their use of IT across the 25 questions. Downloaders answered yes to an average of 8.2 of the 25 closed-end questions, uploaders 9.8, and cyberorganizers 11.7. These figures are provided in Table 3 below along with an indication of where the statistically significant differences appeared; Other numbers merely suggest a trend, which is supported in the narratives.



[®] Data was collected in 2004. With the diffusion of new tools and software, it is likely that these groups now use IT in more and perhaps different ways.

Table 2 Percent and number of 31 groups engaging in each of 25 ICT activities

	Percentage (%)	Number
1 Creating documents on a computer	94	29
2 Using e-mail	94	29
3 Looking for information online	84	26
4 Talking on a mobile phone	77	24
5 Taking digital photos	74	23
6 Texting on a mobile phone	68	21
7 Sharing photo, video, or audio files	65	20
8 Using spreadsheet software	55	17
9 Posting to a group Web page	45	14
10 Reading a bulletin board online	39	12
11 Belonging to an electronic discussion list	35	11
12 Recording digital video	29	9
13 Posting to an electronic discussion list	29	9
14 Recording digital audio	23	7
15 Using instant messaging	23	7
16 Posting to a bulletin board online	19	6
17 Using online chat	19	6
18 Using voice-over-IP online telephony	19	6
19 Using Linux or other open source software	13	4
20 Doing bookkeeping on the computer	10	3
21 Posting to the Web other than a group Web site	10	3
22 Editing an electronic discussion list	6	2
23 Using wireless technology to go online	6	2
24 Using e-mail on a mobile phone	3	1
25 Browsing the Web on a mobile phone	3	1

Table 3 Downloading, uploading, and cyberorganizing, and average number of IT activities per group

	Average number of IT activities	Number
Downloaders	8.2**	13
Uploaders	9.8	11
Cyberorganizers	11.7	7
All	9.6	31

** A statistically significant negative correlation was found between the number of ICT activities and being a downloader group, with Pearson's correlation coefficient of -0.317 , $p = 0.041$, $N = 31$.

A trend associating the purpose of the group with their IT use also emerged. Tenant groups were primarily downloaders. This is suitable for a very local group such as tenants who live in one building or one development. E-mail with government agencies or landlords served to leave a data trail in pursuing complaints. Tenants tended to communicate with each other by face to face or phone for confidentiality and solidarity in the face of difficulties. The cultural groups, on the other hand, tended to be uploaders. They use their websites to recruit people from a wider geographic area than the tenants, to document their successes, tell their stories, and attract volunteers. They attract interest from Manchester and even its global diasporas.



Research Papers

Support groups tended to be cyberorganizers, sometimes without even taking the time to make their own websites. They reason that elders, single mothers, children, all with a variety of social support needs, also need help using IT in order to be included in their families, their local communities, or, in the case of immigrants, their diasporas' communities. Thus IT is closely linked with the purpose of the group.

This echoes early social informatics workplace studies^[21-22] that found people adopting technology that they were either compelled to use or that served their own interests. Scholars of computer literacy emphasize that users adopt practices according to their needs, interests, and goals^[23-24]. Table 4 below presents the pattern: Tenants associations are predominantly downloaders; cultural groups, uploaders; and support groups, cyberorganizers.

Table 4 A pattern across social function and social context

	Downloaders	Uploaders	Cyberorganizers	All
Tenants	7	2	2	11
Cultural	4	9	1	14
Support	2	0	4	6
All	13	11	7	31

With this portrait of IT use by the grassroots community groups, we can now turn to their sources of help with IT. The 31 groups report a total of 62 sources of help in using IT, or on average two people per community group. Basic statistical analysis as in Table 5 below demonstrates that more ties are associated with more IT use. Downloader groups with their narrower set of IT activities have on average 1.4 sources of help. Uploader groups report an average of 2.1 helpers, and cyberorganizer groups 3.0. These differences are statistically significant. In sum, groups with larger social capital, that is, more people they can turn to for help with IT, are using IT more broadly. Since the best-resourced groups are CyberNavigators, and most of them are social support organizations, it looks like groups that are helping

Table 5 Downloading, uploading, cyberorganizing, and average number of ties per group

	Groups' average number of ties	Number
Downloaders	1.4**	13
Uploaders	2.1	11
Cyberorganizers	3.0***	7
All	2	31

** A statistically significant negative correlation was found between the number of ties and being a downloading group, with Pearson's correlation coefficient of -0.370, $\rho = 0.020$ (one-tailed).

*** A statistically significant positive correlation was found between the number of ties and being a cyberorganizing group, with Pearson's correlation coefficient of 0.382, $\rho = 0.017$ (one-tailed).



others with IT have more resources of help for themselves. One can theorize that they are all around relatively well-networked with respect to IT use.

Downloaders in contrast, which are primarily tenants associations, report the fewest number of IT helpers. One can theorize that as they are more narrowly local, they are pressed for various resources, IT help being one. Tenant associations were in fact during the time of the study recognized by the city of Manchester as needing support, and so workspace, a part-time staff and some other resources were provided for that purpose.

The measures of strong ties and bonding social capital are shown in Table 6 below. All results are shown and certain of the differences are statistically significant. First, the right most columns in Table 6 show that IT help to the 31 groups tends to come from strong ties/bonding social capital, across all but one of the ways of measuring it:

Table 6 Downloading, uploading, and cyberorganizing, and five measures of tie strength and social capital

	Downloaders		Uploaders		Cyberorganizers		All	
	Percentage (%)	Number	Percentage (%)	Number	Percentage (%)	Number	Percentage (%)	Number
F: Percent of ties that are family or friend to community group volunteer. <i>Tie strength.</i>	72	18	65	23	81	21	73	62
V: Percent of ties volunteering their help. <i>Tie strength.</i>	50	18	52	23	76**	21	60	62
O: Percent of ties seen at least once in two weeks by community group volunteer. <i>Tie strength.</i>	50	16	42	19	68	19	54	54
H: Percent of ties invited to home of community group volunteer, or vice versa. <i>Tie strength.</i>	50	18	39	23	67***	21	52	62
L: Percent of ties living not more than one mile from community group volunteer. <i>Bonding social capital.</i>	24 ^{††}	17	41	22	60 ^{†††}	20	42	59

** A statistically significant positive correlation was found between a tie volunteering his or her help and helping a cyberorganizing group, with Pearson's correlation coefficient of 0.241, $\rho = 0.030$ (one-tailed).

*** A statistically significant positive correlation was found between a tie being invited over or vice versa and helping a cyberorganizing group, with Pearson's correlation coefficient of 0.216, $\rho = 0.046$ (one-tailed).

†† A statistically significant negative correlation was found between a tie living one mile or closer and helping a downloading group, with Pearson's correlation coefficient of -0.243, $\rho = 0.032$ (one-tailed).

††† A statistically significant positive correlation was found between a tie living one mile or closer and helping a cyberorganizing group, with Pearson's correlation coefficient of 0.255, $\rho = 0.025$ (one-tailed).



Research Papers

- family and friends (73% of all IT helpers)
- people who are not paid to help (60%)
- people who are seen more than once a fortnight (54%)
- who have been invited to the home of the community group representative interviewed (52%)
- but not from people who live closer than one mile from them (42% of helpers).

The last statistic suggests that IT help is not always local, but flows across the metropolis, or as Wellman and Leighton^[25] would say, to the extent that help can be found, it reflects “community liberated”.

By three measures shown in Table 6, IT helpers of cyberorganizing groups are statistically more likely to be strong ties/bonding social capital to that group. Their ties are more likely to be volunteering rather than paid for helping; they are more likely to have visited one another’s homes, and they are more likely to live less than a mile away from the community group representative interviewed. Again, given that most of the cyberorganizers are social support groups whose activities specifically include helping others use IT, training people in IT and so on, it appears that taking this as one’s express duty puts the group at an advantage for its own IT help.

Also shown in Table 6, ties to downloading groups are generally less likely to be strong ties/bonding social capital than ties to uploading or cyberorganizing groups, according to the measure of living within a mile from the group representative. This is particularly noteworthy since the groups are mostly tenant groups and therefore intensely local. One can conjecture that in socially excluded communities, IT help is generally scarcer. If one is highly confined to a geographic locale, there may well be no one nearby to help with IT.

Table 7 provides the age, gender, ethnicity, and employment profile of the community group volunteers and their IT helpers. Although more data is needed on

Table 7 Demographics of community group volunteers and their social ties (help with ICT)

	Median age	Men/Women (%)	Ethnicity		Employment	
			Group	Percentage (%)	Yes	Percentage (%)
Community group volunteers Number = 31	52	55/45	White British	68	In workforce	39
			Black African	13		
			Asian	10		
			Black Caribbean	3		
			Other	6		
Ties (Sources of ICT help) Number = 62	40	80/20	White British	82	In workforce	85
			Black African	5		
			Asian	11		
			Black Caribbean	2		
			Other	0		



National Science Library,
Chinese Academy of
Sciences

this, it appears that groups may be either seeking IT talent or following stereotypes: Younger, more male, more white, and more in the workforce than themselves. An Internet user survey from the same time as this study^[26] provides us these figures on users by ethnicity:

- Among Black Africans, 74% use the Internet
- Asians, 67%
- White British, 59%
- Black Caribbean, 52%
- Others, 61%.

5 Implications

What do these results say about social networks, social capital, IT help, and IT use? It suggests that for grassroots community groups in socially excluded communities, IT help is more like social support than new information. It is more sought from strong ties, bonding social capital, rather than from weak ties, or from bridging social capital. This affirms the digital inequality conceptualizations involving social support^[7-9] at an empirical, community group, level.

It also reveals that socially excluded communities are networked with respect to IT, not isolated and immobilized. People may be bowling alone, but they are computing together. In this setting, people are resourceful. They are reaching out across age, gender, employment differentials, to family and friends, to volunteers, and so on, to find help close at hand in their own communities. Again, this generally echoes Wellman and Leighton's description of social networks in urban communities as liberated, neither encapsulated nor destroyed^[25].

In addition, the study has uncovered 31 instances of a less-studied type of community technology activity. Less-studied because the English-language scholarly literature is dominated by studies of community IT projects that are quite often externally funded. This makes them more visible to researchers, who are most of the time outsiders to the community. Here the 31 cases are of IT use that has grown organically from what community groups are trying to do in and for their communities. This sort of organically emerging technology use is probably harder for outsiders to find and study, although examples exist^[27] and the field of LIS itself (among many) suggests some approaches^[28]. But as technology diffuses into communities which could not previously afford it and as funding from outside shrinks, this is the type of technology use that will be more typical. So far, the fields of community informatics and ICT4D (information and communications technology for development) offer a great deal of work about bringing technology to disadvantaged communities. Now we must also learn from what these communities are doing on their own.



The study has also validated the model: Social networks and social capital do influence IT use. And finally, it has identified three different ways that grassroots community groups, mainly as a by-product of their explicit goals, are helping their communities become digital: By mobilizing their members as downloaders, uploaders, and even cyberorganizers.

What does this imply for policy? An emerging mechanism for social inclusion—the digital life of community groups—can be supported in new ways. For example, local IT projects might productively focus on training or otherwise supporting the home-grown cyberinfrastructure of excluded communities. MCIN itself, the facilitator of this research, has in fact moved in this direction. Local government interested in putting their communities in the digital age might not overlook but rather work with the grassroots organizations in the community sector. The university might expand its curricula for future community-serving professionals—librarians, social workers, teachers, planners—regarding the digital life of communities and how communities use social networks. This is the subject of community informatics and it is taking root in the research agendas and curricula of library/information schools, and not only in the US and China. Most generally of all, everyone working in or studying communities can find in this study one more instance of local social networks, especially strong tie, bonding social capital, productively harnessed to solve social problems. A study of urban Beijing carried out at the same time as this study^[29] echoes these research findings in many ways. With outside help growing scarcer due to shrinking budgets and increasing pressure on everyone, this study reveals indeed many new promising possibilities for IT related agenda in support of underprivileged communities.

References

- 1 UK Social Exclusion Unit. Tackling social exclusion: Taking stock and looking to the future-emerging findings. London: UK Social Exclusion Unit, 2004. Retrieved on February 26, 2012, from http://webarchive.nationalarchives.gov.uk/+http://www.cabinetoffice.gov.uk/upload/assets/www.cabinetoffice.gov.uk/social_exclusion_task_force/publications_1997_to_2006/tackling.pdf.
- 2 Atkins, D. E. Revolutionizing science and engineering through cyberinfrastructure: Report of the National Science Foundation Blue-Ribbon Advisory Panel on Cyberinfrastructure, January 2003. Retrieved on February 26, 2012, from <http://www.nsf.gov/od/oci/reports/atkins.pdf>.
- 3 Granovetter, M. The strength of weak ties. *American Journal of Sociology*, 1973, 78(6): 1360–1380. Retrieved on February 26, 2012, from <http://sociology.stanford.edu/people/mgranovetter/documents/granstrengthweakties.pdf>.
- 4 Granovetter, M. Getting a job: A study of contacts and careers. Chicago: University of Chicago Press, 1974 (2nd. ed, 1995).



- 5 Wellman, B., & Wortley, S. Different strokes from different folks: Community ties and social support. *American Journal of Sociology*, 1990, 96(3): 558–588. Retrieved on February 26, 2012, from <http://homes.chass.utoronto.ca/~wellman/publications/differentstrokes/diff-strokes.pdf>.
- 6 Lin, N. *Social capital: A theory of social structure and action*. London: Cambridge University Press, 2001.
- 7 Clement, A., & Shade, L. The access rainbow: Conceptualizing universal access to the information/communications infrastructure, July 1998. Working paper No. 10. Toronto: Faculty of Information Studies, University of Toronto, Canada. Retrieved on February 26, 2012, from <http://archive.iprp.ischool.utoronto.ca/publications/wp/wp10.html>.
- 8 DiMaggio, P. J., & Hargittai, E. From the ‘digital divide’ to ‘digital inequality’: Studying Internet use as penetration increases. Working paper 15. Princeton: Princeton University Center for Arts and Culture Policy Studies, 2001. Retrieved on February 26, 2012, from <http://www.princeton.edu/~artspol/workpap15.html>.
- 9 van Dijk, J.A.G.M. *The deepening divide: Inequality in the information society*. Thousand Oaks, California: Sage, 2005. Portions of book retrieved on February 26, 2012, from http://www.utwente.nl/gw/vandijk/research/digital_divide/.
- 10 Coleman, J. S. Social capital in the creation of human capital. *American Journal of Sociology*, 1988 (Suppl. 94): S95-S120. Organizations and institutions: Sociological and economic approaches to the analysis of social structure: Retrieved on February 26, 2012, from http://onemvweb.com/sources/sources/social_capital.pdf.
- 11 Putnam, R.D. *Bowling alone: The collapse and revival of American community*. New York: Simon & Schuster, 2000.
- 12 Williams, K., & Durrance, J. C. Community informatics. In Bates, M., & Maack, M.M. (Eds.) *Encyclopedia of library and information science*. Boca Raton, Florida: CRC Press, 2010. Retrieved on February 26, 2012, from <http://people.lis.illinois.edu/~katewill/williams-durrance-encyclo-community-informatics.pdf>.
- 13 Williams, K., & Durrance, J. C. Social networks and social capital: Rethinking theory in community informatics. *The Journal of Community Informatics*, 2008, 4(3)3. 2008. Retrieved on February 26, 2012, from <http://ci-journal.net/index.php/ciej/article/view/465>.
- 14 Hampton, K. N., & Wellman, B. Neighboring in Netville: How the Internet supports community and social capital in a wired suburb. *City and Community*, 2003, 4 (2): 277–311. Retrieved on February 26, 2012, from http://homes.chass.utoronto.ca/~wellman/publications/neighboring_netville.pdf.
- 15 Kavanaugh, A., & Patterson, S. The impact of community computer networks on social capital and community involvement. *American Behavioral Scientist*, 2001, 45, 3: 496–509. Retrieved on February 26, 2012, from http://web.missouri.edu/~mckinneym/comm3100/WWW_Links/BEVarticle.pdf.
- 16 Kvasny, L. *Problematizing the digital divide: Cultural and social reproduction in a community technology initiative*. PhD Dissertation, Georgia State University, 2002. Retrieved on February 26, 2012, from http://ist.psu.edu/faculty_pages/lkvasny/KvasnyDissertation.pdf.
- 17 Kvasny, L., & Keil, M. The challenges of redressing the digital divide: A tale of two cities. In: Applegate L., Galliers, R., & DeGross, J. (Eds.) *Proceedings of the 23rd International Conference on Information Systems*. Atlanta, Georgia: Association for Information



Research Papers

- Systems, 2002, 1-12. Retrieved on February 26, 2012, from http://ist.psu.edu/faculty_pages/lkvasny/KvasnyKeil-ISJ.pdf.
- 18 Liff, S., & Steward, F. Community e-gateways: Locating networks and learning for social inclusion. *Information, Communication and Society*, 2001, 4(3): 317-40. Research report Retrieved on February 26, 2012, from <http://www.esrc.ac.uk/my-esrc/grants/L132251022/outputs/read/0a5c8bfe-2fa7-4047-9fe7-7f6829610003>.
 - 19 Alkalimat, A.(McWorter, G. A.), & Williams, K. Social capital and cyberpower in the African American community: A case study of a community technology center in the dual city. In Keeble, L., & Loader, B. (Eds.) *Community informatics: Shaping computer mediated social relations*. London: Routledge, 2001. Retrieved on February 26, 2012, from <http://www.people.lis.illinois.edu/~katewill/cyberpower/>.
 - 20 McPherson, M., Smith-Livon, L., & Cook, J. M. Birds of a feather: Homophily in social networks. *Annual Review of Sociology*, 2001, 27: 415-44. Retrieved on February 26, 2012, from <http://aris.ss.uci.edu/~lin/52.pdf>.
 - 21 Kling, R. Social analyses of computing: Theoretical perspectives in recent empirical research. *ACM Computing Surveys*, 1980, 12(1): 61-110. Retrieved on February 26, 2012, from http://wiki.cc.gatech.edu/scqualifier/images/0/0e/Kling-Social_analyses.pdf.
 - 22 Orlikowski, W. Learning from notes: Organizational issues in groupware implementation. In Mantel, M., & Baecker, R. (Eds.) *Proceedings of the 1992 ACM conference on Computer-supported cooperative work*. New York: ACM Press, 1992. Retrieved on February 26, 2012, from <http://ccs.mit.edu/papers/CCSWP134.html>.
 - 23 National Research Council Committee on Information Technology Literacy. *Being fluent with information technology*. Washington, DC: National Academy Press, 1999. Retrieved on February 26, 2012, from <http://www.nap.edu/openbook.php?isbn=030906399X>.
 - 24 Williams, K. Literacy and computer literacy: Analyzing the NRC's 'Being fluent with information technology'. *Journal of Literacy and Technology*, 2003, 3(1). Retrieved on February 26, 2012, from <http://www.literacyandtechnology.org/volume3/literacy.katewilliams.pdf>.
 - 25 Wellman, B., & Leighton, B. Networks, neighborhoods and communities: Approaches to the study of the community question. *Urban Affairs Quarterly*, 1979, 14: 363-90. Retrieved on February 26, 2012, from <http://homes.chass.utoronto.ca/~wellman/publications/neighborhoods/wellman,%20leighton%20-%20NETWORKS,%20NEIGHBORHOODS,%20AND%20COMMUNITIES.pdf>.
 - 26 Dutton, W. H., Gennaro, C. D., & Hargrave, A. M. *The internet in Britain: The Oxford Internet survey (OXIS)*. Oxford: Oxford Internet Institute, University of Oxford, 2005. Retrieved on February 26, 2012, from http://www.oii.ox.ac.uk/research/oxis/oxis2005_report.pdf.
 - 27 Williams, K. Informatics moments: Digital literacy and social capital in civil society and people's everyday lives. *Library Quarterly*, 2012, 82(1): 47-73. Retrieved on February 26, 2012, from <http://www.people.lis.illinois.edu/~katewill/lq.pdf/>.
 - 28 Monteil-Overall, P. Cultural competence: A conceptual framework for library and information science professionals. *Library Quarterly*, 2009, 79(2): 175-204.
 - 29 Chen, J., & Lu, Ch. L. Social capital in urban China: Attitudinal and behavioral effects on grassroots self-government. *Social Science Quarterly*, 2007, 88(2) 422-442. The Southwestern Social Science Association. Retrieved on February 26, 2012, from <http://ideas.repec.org/a/bla/socsci/v88y2007i2p422-442.html>.

