

Chapter 21

Moving Beyond “Gender and GIS” to a Feminist Perspective on Information Technologies: The Impact of Welfare Reform on Women’s IT Needs

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Introduction

In headline-grabbing reports called “Falling through the net,” the United States Department of Commerce began reporting in 1999 an increasing gap between those who have access to information technology and those who do not, with poor people, minority populations, elderly people, and women disproportionately losing ground (Department of Commerce, 1999; NTIA, 1999). The digital divide can be seen as part of a broader polarization of resources that benefits those who already possess technological skills, access to information (and information technologies), and a command of multiple literacies. The gender and race aspects of the digital divide relate to other disparities in that women and people of color are disproportionately likely to hold low-skill, low-wage jobs, with few benefits and little opportunity for advancement (Merrifield et al., 1997). These are often the types of jobs that provide the least access to learning about and using information technologies in workplace settings, which further exacerbates the digital divide across all segments of technology use contexts.

Digital divide concerns are also interrelated with other policy issues, including health, education, and welfare disparities among people of different social, economic, and racial backgrounds. We focus on the effects of “welfare reform” in relationship to disparities in accessing information technology for women. Despite the disadvantaged position of many women and people of color in the labor market, welfare policy was dramatically changed in 1996 to include work requirements in exchange for time-limited assistance. As a result, poor women have been involved in either taking jobs that do not provide wages high enough to support their families or facing the loss of their welfare benefits. And the five-year time limit for many poor women to receive public assistance has run out. There seems little doubt that the key to economic stability for the average American family is increasingly linked to education and job skills, which in today’s market include knowledge of

information technology. Those who do not have access to information technologies are going to continue to fall behind.

We sought to examine both the possibilities and limitations of information technologies as a factor in changing the circumstances of poor women and understanding the barriers to accessing technology and related educational programs that prevent them from being able to participate on an equal basis with others in the economic system. Moreover, we began to address the ethical implications of programs that seek to overcome the digital divide because of the inherent inequalities among partners with vastly different resource capacities.

We have been involved in a project that assesses the experiences of poor women through developing a demonstration community technology center (CTC) and associated educational programs in collaboration with community partners at Harrison Plaza Public Housing Development in North Philadelphia (Pennsylvania). The partners involved in establishing the demonstration CTC included the Harrison Plaza Residents' Association, Temple University, the Department of Housing and Urban Development, and the Philadelphia Housing Authority. At the time the CTC was implemented (1999–2001) it was an unprecedented approach to providing access to information and communication technologies because it involved providing extensive opportunities for training that linked technology skills and computer access to basic literacy, basic skills, and job training. The implementation of the CTC was based on a community need for accessing information technology that the partners translated into a request for new computers, improved access to the internet, and the provision of computer-based literacy and job training on location in the public housing development's community center. The community center provided services not only to residents of Harrison Plaza public housing development but also to the 7500 residents of the 11th Street Corridor where Harrison Plaza is located.

We undertook the project as a pathway to understanding the relationship between the circumstances of poor women receiving public assistance and barriers they faced in accessing technology. We viewed this interrelationship as intrinsic to a broader conceptualization of the digital divide, and fundamental to identifying appropriate strategies for addressing barriers to accessing information.

Our objective in synthesizing the lessons learned from the demonstration CTC is to address the outcomes of the project and to argue that the perspectives on information resources of women marginalized by race, class, and poverty suggest that feminist geographic research needs to move beyond a "gender and geographic information system (GIS)" framework to more broadly encompass information technologies. Drawing on broad cross-disciplinary discussions of "GIS and society" and the emerging discourse on feminism and GIS, we will argue that the contemporary discourse fails to acknowledge the social realities of poor women and the social, economic, and political context in which they operate. If poor women's empowerment is to be the goal of information technology research, then more attention needs to be paid to the factors that shape poor women's daily lives, most notably to the institutional constraints imposed through welfare reform, which essentially determine that poor women have neither the time nor the energy to engage with information technology, at least in the manner in which the CTC was originally conceived.

To make our argument, we will first elaborate on the nature of the digital divide and draw on the discourses of "GIS and society," public participation GIS (PPGIS), and feminist critiques of GIS to establish a framework for examining the digital divide in terms of poor women's lack of access to IT. Second, we will describe the initial goals and strategies of the Harrison Plaza Demonstration CTC and discuss why the reality of life under welfare reform for the women required those of us providing IT services and training to poor women to shift strategies. Finally, we will conclude by suggesting what this experience may indicate about a feminist research agenda for IT.

Overview of Digital Divide Issues in the Contemporary USA

The concept of the digital divide, while frequently used in American public policy debates, is ill defined (DiMaggio et al., 2001). The US Department of Commerce (1999) report does provide a beginning point for defining the digital divide, in that it identifies differential access to computers and the internet faced by low-income, minority populations and women as compared with more affluent white and male populations at home and at work. The report found that households with incomes of \$75,000 and above are 20 times more likely to have access to the internet than those at the lowest income level. Even as the percentage of all families with computers and internet access has grown, the gap between whites and non-whites has widened during the past 15 years. More significantly in terms of accessing information resources of the internet, Hispanics and blacks are less likely to access the internet from home (9 percent) than from work (10 and 12 percent, respectively), whereas whites are more likely to access the internet from home (27 percent) than from work (19 percent). Furthermore, in inner-city neighborhoods, only 21 percent of Hispanic and black families have household computers, in contrast to 47 percent of all white (non-Hispanic) families. Furthermore, the study found that female heads of households with dependent children are the population most impacted by the digital divide: their access to computers and the internet is 18 times lower than that of married families with children (the group with the greatest access to computers and the internet).

One of the solutions to close the digital divide that has recently gained prominence is the creation of partnerships (of varying kinds) between technology-rich organizations and communities and community organizations that have limited technology access, with the goal of transferring computers, software, and training across the divide (Mark et al., 1997). Another widespread approach to overcoming differential access has been the placement of computers connected to the internet in public libraries. And many private corporations and large institutions donate old computers to public schools and to community organizations serving the needs of low-income families. Non-governmental organizations, such as NetDay and CTCNet, have also worked to provide technical support to public schools and community centers across the country to overcome infrastructure barriers that prevent internet access within public facilities.

In general, these approaches reflect two means of increasing internet accessibility and thereby reducing the digital divide. One is to find mechanisms to make computers with internet access available to as large a number of people as possible by

upgrading facilities in public institutional settings such as libraries. The second is to find mechanisms for providing facilities, needed equipment, technical assistance, and educational training directly to communities negatively impacted by the digital divide. Yet different concerns drive each approach: the effort to improve capabilities of public institutions is related to a broad societal objective of democratizing information – one of the central tenets that drove the origins of the world wide web; in comparison, the effort to increase internet accessibility within communities negatively impacted by the digital divide is often linked to other interrelated “social service” or community empowerment needs and goals, such as improving job skills and employment opportunities.

Despite the proliferation of models attempting to overcome differential internet and computer access, little research has explored what the gap represents to people with the least access. There is an assumption that the digital divide has profound implications for poor women as a sort of information poverty that exacerbates and reinforces their social and material conditions. But this assumption does not take into account an understanding of how the condition of poverty translates into practical issues that poor women must face. Issues such as balancing work and family responsibilities, accessing health and welfare resources, and interacting with social networks to mitigate circumstances could be reflected in alternative approaches to improving access to information technologies. For instance, community technology center access that does not provide daycare or evening hours means that women with children have less access to resources provided than others that the CTC might serve. And if the facility is located outside of the immediate community location, families may not be served effectively.

Perspectives on how to examine inequality within GIS and society and feminist geography discourses

While the current work on “GIS and society” and the critiques that feminist geographers are making of GIS do not adequately address digital divide issues, the two areas of work are interrelated. We think that by examining empowerment and ethics in relationship to partnerships that arise to develop community GIS, some of the elements of a broader examination of digital divide barriers faced by poor women can be outlined. And we submit that in establishing an approach for describing information technology resources and how they may be accessed, we can address issues raised in relationship to both GIS and IT.

Discussions around “GIS and society,” “PPGIS,” and feminist critiques of GIS collectively examine the relationships and dynamics of the interfaces between society, information technologies, information use, empowerment, and representation. In particular, feminist geographers have underscored themes that have been prevalent within the GIS and society realm, though not explicitly defined as feminist concerns. The points of commonality among these discourses include: the focus on scale (Kwan, 2002a, b; Niles and Hanson, 2003); the implications of examining the social construction of GIS (Schroeder, 1999; Harvey, 2000, 2001; Sieber, 2000; Craig et al., 2002); and the epistemological underpinnings of GIS and how that relates to the projects that GIS is applied to (Mark, 2000; Kwan, 2002c; Pavlovskaya, 2002; Schuurmann and Pratt, 2002). The feminist critique that

diverges the most sharply from the thematic direction of other GIS and society concerns is a focus on the lack of inclusion of women and feminist technical experts in the development of GIS projects (Kwan, 2002b; McLafferty, 2002; Schuurman and Pratt, 2002) and how this creates, as McLafferty argues, a sort of technocracy that seemingly inevitably returns to a mainstream agenda that mitigates empowerment objectives that women may have.

Marking the formulation of an organized critique of GIS with the publication of *Ground Truth*, Pickles (1995a) provides a foundation for examining the disjuncture between technology use and achieving socially relevant objectives. *Ground Truth* draws on geographic conceptualizations of social problems and the discipline's long-standing tradition of linking technological advances, technological knowledge, and geographic knowledge to the analysis of social problems. One of the key themes throughout *Ground Truth* is a concern with the persistent disparities between those who have access to technology and those who do not. Yet the hope forwarded in *Ground Truth* is that simply placing information technology in the hands of marginalized communities, such as the urban poor, would produce such social benefits as more democratized decision-making, improved opportunities for economic advancement, and improved dialogue among the members of marginalized communities (Pickles, 1995a). This view holds that there is an inherent relationship between technology and power, noting that many information technologies were developed purposefully as "instruments of policy making" (Curry, 1995). Harris et al. (1995) assert a transformative relationship between technology and accessibility more directly, stating that since access to information forms a critical element of social power relations, access to information technology represents empowerment. Moreover, they describe the conditions in which a lack of access to technology in fact signifies social and political marginalization.

Examining the issue of access to technology has also been the focus of two research initiatives of the National Center for Geographic Information Analysis (NCGIA), including I-19 (The GIS and Society Initiative) and Project Varenus (Geographies of the Information Society). The central theme of these research initiatives is that society faces mounting problems because of the paradox of widespread dissemination of computers and information technologies alongside significant disparities in the use of and access to these technologies. One of the impacts of these two formal initiatives of NCGIA has been to provide a basis for more nuanced assessments of the implications to society of the rapid advancement of information technologies. Because of this work, more scholars are considering both negative and positive outcomes for both society as a whole and different communities at multiple geographic scales and in varying social contexts (Harris et al., 1995; Onsrud, 1996; Curry, 1998; Wellman et al., 2002).

The idea of participatory and community information technology programs is to develop and use information technology on behalf of and in conjunction with the public, community or marginalized groups (Kellogg, 1999; Nedovic-Budic and Pinto, 1999; Sieber, 2000; Carver, 2003). An important critique that feminist geographers have raised is that, despite the focus on social disparity in regard to geographic information technology (GIT) that these initiatives provoked, and despite the work of scholars across a wide array of partnership projects aimed at disseminating GIT (see Craig et al., 2002, for examples of PPGIS), simply placing infor-

mation technologies at the nexus of community has failed to produce empowerment for marginalized peoples and women (McLafferty, 2002). Feminists point out that unless resources are deployed with an understanding of the realities of gender-differentiated power structures within communities, simply giving resources to “the community” will not necessarily benefit women.

As currently constructed, participatory information technology development and use is mostly interinstitutional, following an evolution of the idea that technology and information is transferred from more to less privileged organizational and community settings. McLafferty (2002) points out the limitations that this can imply for women: they may not be perceived to be technically capable of engaging community or mainstream efforts to develop information resources; specific resources developed may not adequately depict or meet women’s information needs; and women may not be positioned powerfully enough to affect the decision-making processes that ensue as a result of enhancing a community’s information resources.

In practice, the focus of participatory models is typically on transference of knowledge about how to develop technology capacity, as opposed to how communities might best represent themselves and benefit from technology. The concern raised by feminist geographers related to power dynamics in developing GIS is further exacerbated when poor women’s circumstances are taken into account. Herein lies an important area of research concern that our project addresses – that is, the relative differences in the empowerment of partners in specific programs and the relationship of power dynamics within partnerships to the goals that marginalized people, such as poor women, have for achieving empowerment through such practical advances as gaining higher skilled, higher waged jobs and educational improvement (Martin, 2002; Monk et al., 2003). Since the basis of most interinstitutional partnerships is that one partner is more privileged in terms of knowledge about the technology even as the ideal nature of these partnerships might be participatory and reflexive, we need to understand the limitations and advantages of collaborative partnerships among groups with vastly unequal resources, as in the case of the Harrison Plaza Demonstration CTC.

One critical aspect of looking at the power dynamics among collaborating institutions in technology-related partnerships is a need to critically examine the roles of all partners, not just the outcomes to those identified as the population to be served. This means that alongside the need to understand poor women’s perspectives is the need to better understand the dynamics of all partners involved in shaping the information technology use context of poor women. While depicting the framework of information technology use from the perspective of poor women transitioning from welfare-to-work marks a strong contrast with how issues about technology use have traditionally been addressed, such concepts as technology transfer, organizational capacity building, and training are still relevant to a discussion of how to improve the use of technology within marginalized communities. Further, while there is a growing discourse that seeks to evaluate technology use partnerships beyond merely looking at the outcomes of the “transference of technology” (Sheppard, 1995) the idea of a *non*-top down information technology partnership is illusive. We argue that by shifting the attention to the actual technology use setting and partners we can better address the persistent concerns of accessibility, technol-

ogy impacts on organizations, and empowerment (or lack of empowerment) as related to technology use.

Analyzing scenarios of the use and development of information technology from the standpoint of different organization objectives, institutional resources, and human resources capabilities represents an important new area of research in technology adoption. For example, in the field of GIT there have been many studies that identify and assess on a case-by-case basis the organizational approaches to adoption and use of technology in planning and government institutional settings from mainstream and feminist perspectives (Calkins, 1991; Obermeyer and Pinto, 1994; Campbell and Masser, 1995; Masucci, 1995, 1996; Obermeyer, 1995; Lopez, 1998; Masser, 1998; Kellogg, 1999; Schroeder, 1999; Carver, 2003). However, information about community contexts as settings for the use of information technologies is all too often embedded within case study descriptions, even though there is important theoretical work being done to depict how an analysis of community actors is critical to gaining an understanding of how marginalized communities fight to improve their circumstances through participation in mainstream establishments (Escobar and Alvarez, 1992; Perritt, 1998; Pulido, 1998).

Since participatory development and the use of information technologies rely on alliances between mainstream organizations and alternative organizational structures – that is, ones that lie beyond the realm of the public sector and government support – we also think that an understanding about the roles that partner organizations and institutions play in the technology use of marginalized communities is fundamental to understanding the technology use context of the poor. One rationale for this focus is provided by Perritt and Masucci (1997), who argue that community actions often stem from a desire to produce a public awareness of interests not represented in mainstream decision-making structures. This idea is important to the analysis of technology use among marginalized people, such as the urban poor, because these communities are often the only ones that can address the social concerns that are neglected by government and private sector resources, often providing the leadership and impetus for mainstream organizations to create new strategies and approaches that address advocated concerns. As we support democratization of decision-making, it will be critical to democratize access to information technology. In order to accomplish this task, we need to improve our understanding of the context in which poor women, as one important marginalized community, are working to improve their lives (Martin, 2002).

Shifting the focus of "GIS and society" and "feminist critiques of GIS" narratives toward community concerns underscores that if we begin an examination of social inequality from the vantage point of the community, GIS may or may not be how information resource needs are framed. Our interactions around the Harrison Plaza Demonstration CTC support the idea that there is a broader concern with digital divide disparities in terms of access to information technologies and opportunities to learn about them as compared with participating in development of community information resources, including GIS resources, *per se*. In this way, we connect the concerns of geographers with the impact that GIS has on addressing social inequality because if we begin with GIS as the nexus for partnership, we have already implicitly generated a power dynamic between technical expert and

community around organizing geographic information. The same could be said of organizing to implement the CTC, yet we note that its development originated within the community.

As we also take into account the particular dynamics of the community with which we collaborated, a more specific policy directive, welfare reform, permeated the entire implementation discourse, and the actual implementation of the CTC and associated educational programs dramatically reflected the realities confronted by women managing their lives within the context of TANF requirements.

Welfare reform in Pennsylvania and limiting effects on accessing information technologies

A review of the mechanics of welfare reform policy within Pennsylvania will begin to show the complexity faced by women served by the demonstration CTC. The Personal Responsibility and Work Opportunity Reconciliation Act of 1996, more commonly referred to as "welfare reform," eliminated the federal guarantee of cash assistance to poor people and replaced it with a system operated by the states that contains stringent work requirements in exchange for time-limited welfare assistance. The basic program provisions of Temporary Assistance to Needy Families (TANF), established by the federal legislation with states having the option to make requirements more stringent, are designed to promote rapid movement of people from welfare into the labor force, with less emphasis on long-term education and skills attainment.

Pennsylvania's TANF plan, in effect since March 3, 1997, is designed to promote the rapid movement into private sector employment of women receiving welfare benefits. It established a program known as the Road to Economic Self-Sufficiency through Employment and Training (RESET) in which all welfare recipients are enrolled. Despite the title, RESET is based on the unsubstantiated argument that emphasizing a work-first approach (rather than, for example, long-term education) will result in women establishing a work history with increasing wages and benefits that will ultimately lead to economic self-sufficiency. Therefore, when a woman joins the RESET program she is required to develop with her caseworker a personal plan, called an Agreement of Mutual Responsibility (AMR), which specifies the woman's plans to achieve self-sufficiency and how she will conduct the initial job search.

Upon enrolling in RESET, welfare recipients are required to immediately undertake an eight-week job search either independently or through a state-sponsored job search program. If the recipient does not find a job in that eight weeks, she is required to participate in work activities outlined in her AMR. During this period, which ends when the recipient finds a job or after two years' receipt of cash assistance, the woman must participate in work activities such as: independent job search; self-directed community service; adult education, literacy, or English as a second language programs; and welfare-to-work programs operated by independent service providers under contract to the state. No more than 12 months of full-time education, however, can be counted as work activity.

After 24 months, if the woman has not yet found a job, she is required to participate in a more restricted set of work activities for at least 20 hours per week,

including: an unsubsidized job; subsidized employment; work programs operated by independent service providers that will arrange 20 hours per week of work activities; on the job training; or community service jobs. In other words, training and education can only be undertaken *in addition* to the mandatory 20 hours per week of work activity. If a recipient does not find a job within 60 months of joining RESET, she will receive no more cash assistance. Furthermore, if a woman willfully fails to participate in any aspect of the welfare program, she will be sanctioned, resulting eventually in loss of benefits. Finally, there is a lifetime limit of 60 months' assistance, after which welfare recipients are cut off from any further cash assistance at any time in their life.

One of the underlying assumptions of this welfare "reform" is that poor women with children will become economically self-sufficient through employment. Yet against this optimistic projection are the facts that most women are in sex-segregated and race-segregated occupations with the attendant low wages and lack of opportunity for advancement, that there is still a significant gender/race wage gap, and that many women's wages are less than adequate to support a family (Reskin and Hartmann, 1986; Hanson and Pratt, 1991, 1995; Kodras and Jones, 1991; Institute for Women's Policy Research, 1995; Blank, 1997; Gilbert, 1997, 1998). Indeed, the contemporary US labor market is undergoing dramatic changes that include a polarization of wages, an increase in low-wage service sector jobs, and increases in part-time and temporary employment, all of which have further disadvantaged many women and minorities (Kodras and Jones, 1991; Jezierski, 1995; Blank, 1997; Dresser and Rogers, 1998; Harrison and Weiss, 1998).

The result of these trends is that many women who work for wages are little or no more financially secure than they would be if they had received payments from "welfare" (Spalter-Roth et al., 1993). Additionally, research has demonstrated that 43 percent of former welfare-recipient mothers worked substantial hours but still could not find enough work to lift their families out of poverty (Institute for Women's Policy Research, 1995). Furthermore, research has demonstrated that welfare recipients are disproportionately low-skilled and many lack the basic education skills necessary to acquire and retain employment – particularly for jobs that pay living wages (Burtless, 1995; Olson and Pavetti, 1996; Heinrich, 1999). These data, in the context of a welfare reform that has increased the numbers of working poor women and the competition for low-wage jobs, suggest that we urgently need to examine whether increasing access to technology and related educational programs will help poor women to attain employment at wages that will lift their families out of poverty.

Harrison Plaza Demonstration CTC

Because of strict guidelines related to RESET in terms of obtaining paid work, one of the key themes expressed by the Harrison Plaza tenants' association was that in developing the demonstration CTC, educational programs that would emphasize building information technology skills were to be prioritized above other concerns. A further community requirement was that the demonstration CTC was to be housed within the public housing development. A final constraint was that it could not be networked to the housing authority because of concerns related to privacy.

After a year of planning, the Harrison Plaza Demonstration Community Technology Center demonstration project opened in 2000–1, centrally located in North Philadelphia's 11th Street Corridor, serving one of the most economically distressed communities of the city. This geographic area is home to over 7500 residents, including 3318 residents living in four public housing developments. The inner-city area served by the Harrison Plaza CTC is characterized by extreme concentrated poverty, with the associated social characteristics (i.e. illiteracy, school drop-out, and lack of job networks) and spatial isolation due to a history of deindustrialization, disinvestment, and racial discrimination in housing and labor markets (Wilson, 1996; Jargowsky, 1997). A report based on 1990 census data and other sources describing the community and school characteristics of William Harrison Middle School, located adjacent to the Harrison Plaza CTC, provides a profile of a community in need of resources (Yancey et al., 1995). The residents of the area are predominantly minorities (82.6 percent African-American and 7.6 percent Latino). Educational attainment levels are low: 45 percent of adults have less than a high school education and 29 percent have a high school degree or equivalent. The residents experience the highest rates of unemployment and poverty in the city, resulting in significant numbers of households requiring public assistance. Consequently, the mean household income in 1990 was \$10,035; nearly 55 percent of the population and 74 percent of youth live below the poverty line. Furthermore, 95 percent of students attending the middle school receive free or reduced cost lunches.

If we focus solely on residents of Harrison Plaza, the picture is even more devastating. According to Housing and Urban Development information, as of April 1999, the average annual income for residents, all of whom are African-American, is \$6906. Almost all residents are living in extreme poverty, defined as below 30 percent of median household income. Only 22 percent of households receive any wages and 65 percent are receiving welfare benefits.

The large numbers of female headed households in this area who rely on public assistance and public transit, combined with the metropolitan labor market characteristics of an advanced service economy (i.e. the suburbanization of employment, polarization of jobs in terms of skill levels, wages, and benefits, and occupational segregation by sex and race), have presented significant challenges to the implementation of Pennsylvania's welfare reform plan. This means that one of the challenges addressed in implementing the demonstration CTC was how best to address the needs of a group of women who are among the most marginalized in terms of access to technology and in terms of access to jobs and services.

The demonstration CTC was designed to be used by residents of the four public housing developments located nearby the community center, as well as other residents in the surrounding area. The community perceived the CTC to be a critical resource for its ability to balance welfare reform impacts for women and their families. Prior to the establishment of the CTC, there was only one functioning computer at the center available for use by residents and one continuing after-school program that served approximately 25 elementary and middle school students.

Through the collaborative approach of this center, partners worked together to obtain funding from HUD for a technical assistance grant to the Residents' Council of Harrison Plaza to support upgrading the equipment and software capabilities of the CTC. Partners also collaborated on identifying, developing, implementing, and

managing new educational programs. Program expansion was made possible by drawing on the interests and strengths of various partners, providing new technical and educational resources for populations that had been previously not served by the CTC, with the major emphasis on serving adult women involved in the transition from welfare to work. CTC partners supported the administration of the center and its educational programs, and recycled computers to distribute to residents for home use. The CTC functioned as a location for basic and technology literacy training, basic skills training, and technology-related job training during the year the demonstration project was implemented.

Project outcomes

The demonstration CTC eventually consisted of seven new personal computers with Pentium III processors, modem connections for three of these computers, and a printer available for one computer. Specialized software included vocabulary building, literacy training and reading applications that were age-appropriate, math and science games for children, and typing and resume-building applications for adults. Through two years of discussion about the particulars of the CTC, no consensus on the composition of computers was ever achieved, and despite intense efforts to address such issues as how workstations should be configured, the appropriate balance of Macintosh and Windows personal computers for specific populations and purposes, and developing a community approach for identification of appropriate software, again no consensus among the collaboration partners was ever achieved. The default approach for implementing specific choices was that the on-the-ground service providers worked behind the scenes of the formal planning and implementation process to purchase computers and begin a patchwork network that ultimately comprised the CTC resource.

Temple University's role within the collaboration eventually focused on developing and implementing pilot educational programs made available during the year (2000–1) of the operation of the demonstration CTC. These programs emphasized the development of technological literacies alongside basic skills and literacy among the individuals served. The programs included an adult basic computer education course, an after-school program, open computer access hours throughout the day and evening, and two internet access courses. The center was open from 9 a.m. to 9 p.m. in the fall and from 9 a.m. to 6 p.m. in the spring. The CTC and associated educational programs were maintained through an informal coalition of community residents, the Harrison Plaza Tenant Council, and Temple University faculty, students, and researchers.

The original objective of these programs was to provide opportunities for the adult residents of Harrison Plaza (mostly women) to gain access to computers and basic computer education as an effort to overcome the digital divide issues that challenge the Harrison community. As the programs evolved it became apparent that time constraints – due to balancing the needs of accessing services, participating in welfare reform mandated activities (such as paid employment, job search, and job training), and raising children – presented a significant barrier to the direct participation of women in programs of the CTC. Within the bounds of the demonstration project, there was no way to compensate for these demands on the women; thus, their direct use of CTC ended up being very limited.

However, the participation of children at the CTC was extensive – nearly 50 children accessed the CTC on a daily basis through participation in the After School Program (the After School Program consisted of homework assistance, computer training, and life development skills and recreation). And through participation of children in the After School Program, the CTC was involved in an outreach program to address needs of adults interested in gaining access to resources of the CTC. Several community events were organized to welcome adult family members into the CTC through supporting children in the After School Program. These included assemblies, open house events, and celebrations of achievements of children. For many adult family members, engaging with the activities of the CTC through children's activities was the first time they had accessed a computer lab.

Even though the demonstration year is over, as a result of the experience of the CTC program, Temple University faculty (such as ourselves) have developed a long-term approach to addressing digital divide issues in the Harrison community. Through an extensive process of interacting with families, literally door-to-door, we have worked to establish a relationship in which there is a commitment to working with families to enhance access to computer resources and associated educational programs, and to strengthen linkages between university students and families in the Harrison community. Our commitment to families has resulted in collaboration to implement ongoing education programs in association with the Harrison Family Center (adjacent to the property of the Harrison Plaza Community Center). The CTC and associated educational programs have been integrated within the programs of the Harrison Family Center. The Harrison Family Center continues to involve community members and Temple University faculty and students in the development and delivery of educational programs. And the Harrison Family Center facilities include a computer lab, as well as classroom space for the After School Program, which provide continuity for families served during the demonstration CTC program.

Finally, in assessing the challenges associated with implementing the CTC and associated educational programs, we identified the following barriers that continue to create a digital divide for this community, above and beyond the actual limitations of computers and software available for instruction and access to computers and the internet:

- limited access to high speed internet service providers and limited networking capability in community and school computer lab facilities;
- lack of facilities that can be allocated to computer labs and associated programs;
- limited availability of qualified staff and investment in supplies, hardware and software upgrades, and network administration;
- extreme geographic, social, and economic isolation of the Harrison Community, constraining the development of an adequate infrastructure to support a networked lab with universal access to the internet;
- limited access to trained community service providers in the area of technology use;
- limited overall computer access in the community.

Ultimately, however, the most significant barriers to poor women's participation in the CTC and related programs were the result of women attempting to fulfill their

multiple roles of family providers, mothers, employees, students, etc. within the constraints imposed by welfare policy, and more broadly the changing political economy, institutionalized racism, and gender relations.

We suggest that if the beginning point for collaboration had focused on developing specific information resources as opposed to developing a context within which information resource discussions might take place, the specific information that is relevant within this community might never have emerged. Moreover, the issues we identify above give a more nuanced perspective on why developing community technology resources is such a complex process.

An anecdote often cited during planning meetings related to implementing the demonstration CTC was that another housing development had implemented a \$1 million state-of-the-art computer center linked to the internet via a T-1 connection. According to the Harrison Plaza Tenants' Council, the lab failed because it had been located in what had previously been an apartment building against the wishes of residents who wanted it to remain as housing. Residents refused to use the facility, which sat empty, to the dismay of the architects, housing development planners, and consultants. In developing the Harrison CTC, the Tenants' Council steadfastly resisted such a top-down approach, and while the digital divide barriers identified above persisted, the small steps in implementing the developed resource did support organizing and educational goals of the community.

Relevance of the Demonstration CTC Project to Feminist Research on GIS

One of the most important issues that our project addresses is how to better conceptualize the digital divide. In our view, a better conceptualization involves examining the interrelationships among the technology use context, social networks, and the social policies and institutions regulating IT use. We conclude that this more nuanced conceptualization will better allow us to understand the relationship between access to IT, the information sought and obtained by individuals, and its impact on personal decision-making. And we find that if feminist geographers broaden the focus from GIS as an approach to empowerment toward these inter-related elements of technology access, we may be better positioned to support empowerment objectives of poor women.

An improved conceptualization of the digital divide also has strong implications for how feminist geographers relate to information technology issues, including addressing concerns about how to use GIS as part of feminist research projects. Improving technological literacy and ultimately gaining equal access to internet information resources seems to be inherent to this objective. However, an expanded notion of "technology accessibility," one which anticipates different interrelated facets of technology access that go beyond mere availability of computers and communication process, addresses how people interface with computer technology. This would involve an examination of the intersection between social science and information technology constructs on technology accessibility.

We suggest that when poor women's experiences are taken into account, it becomes clear that GIS research is inadequate without continued revisioning and reconceptualization as a tool for organizing and analyzing community information.

Examining digital divide barriers to accessing information technology underscores the difficulties encountered in the development of and participation in processes to develop community information resources for women who participated in the Harrison Plaza Demonstration CTC. We conclude by suggesting that GIT projects need to include a focus on how women differently perceive what information is relevant to their daily circumstances – and that this depends on race and class experiences. Further, we argue that organizing around information technologies, including developing and implementing geographic information systems, takes pre-eminence over the authentication of specific information technology implementation or the development of information systems from the standpoint of poor women.

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