

A CONCEPTUAL FRAMEWORK FOR EXAMINING DIGITAL INEQUALITY

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Abstract

As information and communication technologies (ICT) are disseminated into inner-city communities, we tend to assume that broader access will naturally improve the life chances of the local actors that live in these historically underserved neighborhoods. However it is also prudent to challenge this assumption through an examination of the unintentional effects. Using empirical examples from an ethnographic study of a community technology initiative, this paper presents a conceptual framework for examining the roles of technology, culture capital, social capital, economic capital, and institutions in shaping the emerging pattern of digital inequality that reflects disparities in the structure of access to and use of ICT.

Introduction

Prevailing trends in information and communication technologies (ICT), economic strategies, social interests, cultural values and power struggles are clouding what could be an exhilarating moment for humankind (Ellul 1964; Castells 1989; Postman 1992; Schiller 1996). While new technologies provide possibilities for material prosperity and social inclusion, deepening patterns of socio-spatial segregation in cities are ushering in new urban forms and processes that Castells (1989) identifies as the “informational city”. The informational city is one that is polarized between highly valued groups on the one hand, and devalued groups threatened with social and economic irrelevance on the other. The information economy has little use for unskilled and uninformed populations, and the government and civic institutions designed to uplift and serve inner-city residents. Consequently, many residents are socially isolated in inner-city neighborhoods and have no other recourse but to remain in these neighborhoods (Wilson 1996). Scarce opportunities exist to overcome the vicious cycle of poverty, illiteracy, sporadic work, racial and ethnic discrimination, and criminal activity. In the informational city, ICT has the potential to become an additional mechanism for reproducing and deepening social structures and power relations (Moolenkropf et al. 1991).

As ICT diffuses to inner-city communities, quality of use becomes an important bases by which the benefits of the technology are stratified and exacerbated (DiMaggio et al. 2001; Patterson et al. 2000). People are not treated as equals in the institutional spheres that affect their life-chances: in their education, in their work, in their consumption opportunities, in their access to social services, in their domestic relations, and so forth (Outhwaite et al. 1993). We use the term digital inequality to represent the historical patterns of social stratification that result in the unequal access to and use of ICT.

To broaden and contextualize our understanding of digital inequality, we examined ICT adoption and use by residents participating in programs offered at a community technology center located in an urban inner-city neighborhood. Community technology centers are public facilities that provide basic computer training and access to local residents. These facilities represent an institutional response to combat the social inequalities that exist in the informational city. However, we know from organizational studies that ICT has both beneficial and detrimental, intended and unintended consequences (Kling 1998; Kling 1999; Sawyer et al. 2002). Increased diffusion of ICT does not necessarily imply greater democracy. To the contrary, we argue that increased access to and use of ICT both facilitates positive social change as well as perpetuates the status quo.

This paper begins by describing the research setting and the methodology. We then present a conceptual framework for examining digital inequality. Rather than suggesting hypothesis for empirical testing, this framework provides concepts that can be used

to explore the role of institutional, cultural, social, economic and technical forces in perpetuating inequality under the aegis of free public access. These concepts are developed and explained by grounding Bourdieu's theory of cultural and social reproduction (Bourdieu et al. 1979; Bourdieu 1990) in empirical data. The paper concludes with a discussion of how institutional reform might be expected to occur as a result of the active use of this framework in ICT training centers.

Research Approach

This field study was conducted at the headquarters of a community technology initiative sponsored by a major urban municipality. The mayor announced the initiative in December 1999, and in the first two years of operation, eleven community technology centers have been opened in areas of the city where residents are not likely to have access computers. The centers offer free public access to high-end computers with broadband Internet connections, as well as a basic and intermediate course in popular business applications such as Word, Excel and PowerPoint. These courses are taught by paid facilitators and are offered to seniors, adults and school-aged youths. To meet the demands of these diverse participants, the centers are open from 9:00 am until 9:00 pm. Over 7000 residents have participated in these courses.

Data were collected over an 8-month period using ethnographic methods of participant observation, unstructured and semi-structured interviews and document analysis (see Table 1). Semi-structured interviews were conducted with the management and staff to gain an understanding of the historical context and operations of the centers. These interviews were supplemented with analysis of published documents such as newspaper articles, Requests for Proposals, City Council meeting minutes, and strategic planning reports.

Participant observation was used to gain an understanding of the curriculum and to learn how the participants used ICT. The researcher followed a group of 15 participants and a facilitator through the initial orientation session, the 7-week basic computer course and the 7-week computer applications course. Unstructured interviews were conducted with participants to explore their life histories, and their perspectives of ICT and community technology centers. These unstructured interviews were informal conversations that took place in the break room, classrooms and labs.

Table 1. Ethnographic Data Trail

Empirical Evidence
250 hours of participant observation
200 pages of field notes
50 informal interviews (planned and opportunistic)
75 client projects
100 digital photos
100 documents (reports, strategic plan, news articles, forms, fliers)
1 research log

To focus data collection and analysis, a list of content codes based on Bourdieu's theory was developed *a priori*. These were supplemented with additional content codes that emerged from the fieldwork. Concept cards, a technique for classifying and subsequently analyzing data (Glaser et al. 1967), were developed for each content code. Each concept card contained quotations and written-out explanations of the coding categories. Related concept cards were grouped to form high order themes. These high order themes were subsequently decontextualized to produce a conceptual framework for examining digital inequality. This framework is presented and discussed in the following section (see Figure 1).

Conceptual Framework For Examining Digital Inequality

Through the concept of digital inequality, the authors integrate social and cultural considerations into the prevailing digital divide discourse that narrowly focuses on technology access and market forces. We argue that the digital divide can't be adequately understood outside of the broader context of social stratification. Time is included to denote the persistence of the gap in access to ICT and related life chances such as career and educational opportunities. Each factor included in this framework is described in the following sections.

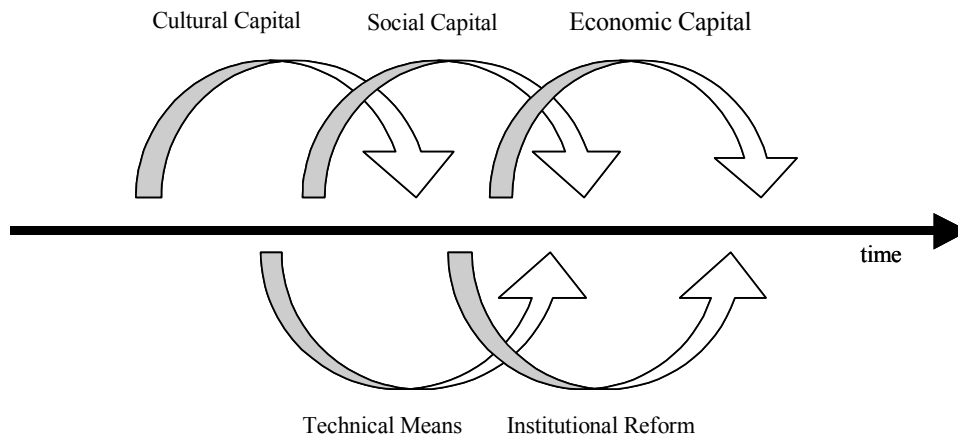


Figure 1. Dimensions of Digital Inequality¹

Technical Means

Technical means refers to the connectivity and availability of computers, modems, printers, scanners, telephone lines or other means of connecting to the Internet, and Internet accounts. Access can occur at home, work, school, public libraries, or other community facilities, such as community technology centers. However, differences in the quality of the hardware, software and connections may limit the ways in which different users can employ the Internet (Kling 1998). For instance, can the hardware, software, and connections support java applications, sophisticated graphics and streaming video contained in many websites?

Unintended outcomes can occur when the quality of the technology is too high. For instance, the Microsoft Office 2000 software available at the community technology center was newer than the Office products that the participants had access to at home, at school, and at work. As a result, participants were sometimes unable to read or modify the files that they had created at the community technology center. Managers of community technology centers acknowledge this problem and state that funding agencies and corporations tend to be skeptical of grant proposals that request older software or less powerful machines. For that reason, managers tend to write proposals for in-kind and cash donations that request more bandwidth, more computing power, and more sophisticated software than might actually be needed.

A second concern related to technical means is the degree of autonomy that the user enjoys when using the technology. Much of the benefits derived from the computer and Internet access are closely related to a user's ability to experiment, and explore in an unstructured environment. Limitations in educational attainment, for example, restricted some participants' use of technology.

In some cases, spelling and grammar checking features in Microsoft Word were ineffective because participants typed entire documents in capital letters. In other cases, the spelling was too far off to effectively use search engines. One insightful participant questioned why software programs always located the help feature at the rightmost side of the toolbar when in fact that was the most useful feature for novice users.

It also matters greatly where people get their access to the technical apparatus, whether their use is monitored or unmonitored, or whether they must compete with others for time online (DiMaggio et al. 2001). For instance, participants expressed frustration when using the public terminals at the library because a 30-minute time limit was imposed when there were others waiting to use the PC. The public access facilities at the Workforce Development Center, which was collocated in the same building as the community technology center headquarters, did not allow the use of diskettes or other secondary storage devices. The teenagers, in particular, noted that institutional access provided at schools, libraries, and community technology centers was not "real" access because their use of technology at these institutions was structured and controlled. These participants rarely had time for purely recreational and experimental use of the Internet.

¹Economic, cultural and social capital are based on Bourdieu's theory.

Cultural Capital

The second factor, *cultural capital*, is the accumulated stock of knowledge of prestigious forms of cultural expression which is learned primarily through socialization in the family and in educational institutions. This knowledge forms an internal code that equips agents with empathy towards, an appreciation for, and a competence in deciphering cultural relations and artifacts. For Bourdieu educational institutions are not as much sites for the distribution of knowledge or cultural capital. To the contrary, educational institutions serve as sites for legitimizing, reifying and rewarding the cultural capital of the middle and upper classes. Therefore, cultural capital is crucially important for examining digital inequality because the Internet reflects the culture, tastes, preoccupations, styles and interests of the middle class. Because there is such a wealth of content on the Internet that meets the needs of those living in a middle class English-speaking environment, it is easy to assume that there must be something on the Internet of benefit to everyone.

Despite the rhetoric about the declining significance of race, gender, and socio-economic status in cyberspace (Rheingold 1994; Turkle 1995), the myth of the neutrality of ICT is especially troublesome when we consider historically underserved communities (Kvasny et al. 2000). These communities are denied access to basic life chances such as adequate housing, nutrition, education, employment opportunities and health care. Technology training highlights these differences by making participants acutely aware of their marginal status. As one participant remarked, "I didn't even know that there was a digital divide until I came to the [community technology center]."

Parents felt demoralized and described themselves as "the forgotten generation" because their children possessed greater technical knowledge. One participant recounted a story in which she eagerly demonstrated a new computer technique to her son. Her son watched and simply replied that he had learned that technique in preschool. Another participant shared his embarrassment in not being able to answer his grandson's questions about the computer.

My 7 year old grandson shamed me when he asked me questions concerning computers. Even though there is a 57-year education gap... there is no excuse for my lack of knowledge.

Participants also lamented about feeling inferior because of their lack of computing acumen, and in doing so, affirmed and reproduced their marginalized status.

I like computers but I would like them more if I knew how to use them. People who know something about computers probably think I am dumb.

Consumption of technology was viewed as a mark of distinction. The technology was often revealed to participants as something that "smart people" do naturally. Several participants remarked that sending email made them feel like businessmen, and nearly every participant that was interviewed initially doubted their ability to use computers.

I thought that I would be the last one to have an email address. I was once at a meeting and everyone in my group had an e-mail address. I was embarrassed not to have one because everyone else was a senior citizen with some sort of computer knowledge.

Economic Capital

One of the most obvious factors needed for effective ICT usage, especially in a home setting, is *economic capital*. The inevitable household tradeoffs required in making a PC purchase and in obtaining continuous telephone service to act as a gateway to the Internet may be too great for some families (Schement 1995). However 18% of the participants at the centers did in fact have computers in their homes. Most of those with home PCs reported that their computers were handed down to them from friends and family members.

Somewhat ironically, the economic costs of computer ownership became more important after the participants obtained training from the community technology centers. For instance, one participant reflected on a visit to a local electronics store.

Looking at all of that technology upset me. It made me realize that I really needed to make some money so that I can get the things that I wanted. A job is the only way that I am going to be able to afford those things.

In other instances, economic factors explained neither the lack of computer ownership nor the lack of computer use. One participant, for example, purchased a brand new PC six months ago but it was still sitting in a box because she was not sure what to do with it. She just didn't know how to use a PC out of the context of the highly structured work environment of a call center representative. Ron received a PC with a broken video card from his niece. The computer sat in a box for over a year because he didn't know much about computers and was therefore too intimidated to take the PC in for repairs. The cost of the repair was relatively less important.

Social Capital

Social capital, in Bourdieu's approach, consists of all actual or potential resources linked to the possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition (Bourdieu 1985). The benefits that one can potentially receive from participating in these networks might come in the form of information, support, guidance, or additional social contacts. Since it is often colleagues, friends, and relatives who provide the information and guidance necessary to learn how to use online networks, social capital is an important variable affecting ICT.

In this study, there were strong ties between individuals within the community, but few connections with individuals and institutions outside of the community that were powerful enough to move them out of poverty. In fact, it is precisely these strong social networks within the community that brought people to the centers in the first place, and enabled the center to develop into a third place that is comfortable, has low barriers to entry and is frequented by regulars. These word of mouth recommendations were the primary mechanism for attracting residents to the centers.

When I was standing in line at the bank the other day, I started talking with this security guard to pass the time. I told her about the free computer classes at the [community technology center], but she didn't want to believe me. The more I kept telling her that it was free, the more she kept calling me a liar. So I told her, the next time I come back I'm gonna personally bring her a flyer and tell her to call the number. Now I'm a lot of things, but I ain't no liar.

Gaining access to new social resources at the centers is as critical as gaining access to hardware. Studies demonstrate how the users of community technology centers extend their own relationship to technology by later assisting their own friends, relatives, and associates (Chapman et al. 1997; Chow et al. 2000; Kvasny 2002).

I want to be able to share my knowledge with others. Like, I got this friend... and I was telling him about the [community technology centers]. He is afraid to come. He wants to learn about computers but is intimidated by them. Now he will go and pay to take night classes in reading, writing and math so he's not afraid of a classroom. But he is intimidated by the technology. He is afraid of computers but he knows that he has to get into them. Now if I have a computer in my house, I can teach him what I learned. Then he could learn from me.

Social capital is not always a positive asset. The push by the centers to use the technology to help amplify existing social networks within in community may facilitate the creation of a "cyber ghetto". Strong ties developed in the centers are based largely on ethnicity as the entire staff and 80% of the students were African American. Ethnic solidarity helped to create strong ties that helped to create the impression that the digital divide was being addressed as a "black issue".

Institutional Reform

Institutions mediate virtually all of economic, political, and social life. The nature of the institutions that people belong to, the relations of power that exist in those institutions, and the types of institutional reform that occur all seriously affect whether people can make meaningful use of ICT. During periods of rapid change, the reproductive functions of institutions may be more easily masked because our attention is focused on the novelty and the opportunities associated with the innovations. While the discourse of innovation, transformation and revolution emphasize possibilities, it tends to deny that historical patterns will continue to shape the future. This discourse exhibits a type of historical amnesia whereby we have selectively forgotten about the poor state of the public school system, the relative lack of employment opportunities, and the limited availability of affordable daycare that also beset these communities.

Thus *institutional reform* is introduced to underscore the fact that participants in the community technology initiative are not acting in isolation. Beliefs about, access to and use of ICT are continually transformed by the participants' reaction to the strategic choices of corporations, and the regulations and policies set forth by government agencies. These institutional forces continually alter individual-level incentives and constraints that help to produce unequal access to technology (Neuman et al. 1998; Kvasny 2002; Lentz et al. 2000; Rojas et al. 2001).

Individual-level constraints and incentives fall into three categories: situational, institutional and dispositional. Situational barriers are those having to do with lifestyle such as childcare, financial resources, and transportation. Institutional barriers are related to the structural opportunities available to an agent. Finally, dispositional barriers are those related to personal knowledge and motivation. Community technology centers, an institutional response to redress the digital divide, do much to alleviate these barriers.

The most frequently cited barriers faced by participants were situational. For instance, transportation to the centers presented challenges to those participants with limited incomes and those relying solely on public transportation. Female participants, in particular, had to leave class early or missed class due to childcare and job constraints. To combat these situational obstacles, the city recently introduced a "cyber bus" to bring the technology into the communities. The bus is equipped with a dozen computers, and a facilitator travels on the bus to provide technical support to users.

Although institutional rules and regulations impose limits on the duration of use and the type of content that can be accessed, community technology centers help participants to overcome dispositional barriers. Dispositional barriers are the most difficult to surmount because these are very personal and longstanding beliefs that tend to be resistant to change. Bourdieu introduces the term *habitus* to stress the importance of these attitudes and dispositions in producing the habitual nature of practice (Jenkins 1992). Before a participant will use ICT, she must be predisposed to accept the legitimacy of technology. That is the participant must have some minimal knowledge, interest, skill or talent that draws her into the community technology center and informs a view technology training as appropriate, interesting, or useful (Gorard et al. 1999; Gorard 2000).

Educational experiences of the past are expressed in the participants' representations of the community technology center. For instance, participants reflected on the lack access to basic academic resources such as textbooks when they described the community technology centers as places with "computers, friends, and no books".² In a testimony at the City Council Finance Committee hearing, an elderly male participant remarked that he had lived and worked in the city his entire life. For him, the community technology centers represented the first time that he had ever been educated in a modern building with new equipment. A City Councilman also alluded to the longstanding inequities experienced by inner-city residents.

The majority of [the citizens participating in the community technology centers] have lived in this community for over 10 years. You have paid taxes here for years, and you have carried the city through history. You didn't leave like some people who left and are now coming back to the city. You've paid your dues, and you deserve this program. If someone asks you why you deserve this program tell them – If I got my 40 acres and some Microsoft, we wouldn't be doing this.

Unlike the public educational system, the community technology centers were viewed as non-threatening and supportive learning environments. A participant wrote, "The community technology center is a wonderful place that I plan to learn a lot about myself and what computers plan to be like in days to come. It sure be a great day when [we can] obtain an education [in a] pressure free classroom setting. Maybe everyone in the future will be able to use a computer without the headache."

The community also embraced the centers because institutional mechanisms such as exams and grades were not imposed. On the first day of class, for instance, several adult participants seemed a bit apprehensive about being in a classroom environment. The participants began asking many questions about attendance policies, logistics, and course content. However, the primary source of their discomfort was the prospect of being subjected to testing and the ramifications for failing to master the curriculum. When the participants asked the classroom facilitator about examinations he responded, "I may go around the classroom and ask ya'll questions, but I won't give any real tests. I wouldn't do ya'll like that."

²Nearly every participant held the belief that "Black folks don't read", "Many things are hidden from the community simply because we [African Americans] don't read", and "Black people don't take advantage of programs like whites do. That's part of the reason why we are being left behind."

Conclusion

In this paper, we have presented a conceptual framework for a holistic approach for analyzing digital inequality that goes beyond common conceptualizations of the digital divide that narrowly focus on technology access and interface usability. The authors contend that unequal access is rooted in historical, institutional, economic, cultural and social conditions that underlie technology use and distribution as well as capital development. While the technology is crucially important, we must also take into account environments and histories, as well as the local conditions of ICT access.

Perhaps most importantly, institutional reform must consider the nihilism, a disease of the soul where there is little hope for the future and a little motivation for struggle, that inhabits our inner-cities (West 1994). Nihilism occurs when individuals internalize the limits set by history and current social conditions, and decided that their adoption of ICT won't make a difference in their material conditions of existence. Even though the technology was thought to improve social inclusion with their families, friends and communities, some participants still saw the same closed doors, dead-ends, and limited prospects with respect to using their IT skills for economic empowerment.

What do I think about the Internet? It is a kind of mind destruction. It is kind of like Christmas where the media comes into your house and just takes over. The white man is invading my home through radio and TV ads. He is programming my family to want this stuff. The black man can't afford to give his family all of this stuff. So technology becomes a nightmare for us. We really don't want no part of [it].

It is a form of slavery where people have no control. We are at the mercy of the system with no control over our lives... We risk our lives everyday just because we live in the 'hood. There is daily violence against each other. We are filled with anger and frustration. We take it out on each other. The Internet may be just one more institution that is being developed to not support black interests. What does the Internet mean for our survival?

Community technology centers, libraries and other community institutions have accomplished much. People who have never touched a computer are learning to send email and are producing letters using a word processor. However, these institutions must begin to address the many demands coming from the people within the communities that they serve. This study suggests the need for extending social networks beyond the community, providing basic literacy training, establishing linkages to employers, and developing locally relevant content. Institutional reform would also include opportunities for participants to teach one another, and provisions for childcare and transportation. Finally, institutional reform should include more advanced and unstructured learning opportunities to create an environment where self-determination can flourish. Participants need to sense that structural barriers can be surmounted and that tangible benefits can accrue from ICT use. Otherwise, the centers may be underutilized and we will have simply created yet another system that does not support the interests of historically underserved communities.

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