

# Homeless Young People's Experiences with Information Systems: Life and Work in a Community Technology Center

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## ABSTRACT

This paper explores how homeless young people, aged 13-25, make use of information systems in daily life. Observed in a community technology center, four different examples of uses are described: i) Using digital tools to find employment, ii) Telling stories with representations of the built world, iii) Portraying life on the street with video, and iv) Constructing online identities. From these examples and a discussion of this community, a framework of ecological considerations is proposed. This framework distinguishes between elements of “life” on the street (Self-Reliance, Vulnerability, and Basic Needs) and “work” in the community technology center (Conformity, Youth-Adult Relationships, and Goals). Any information system for homeless young people must engage the tensions and opportunities that arise from these two different perspectives of homelessness.

## Author Keywords

Homelessness, youth, identity, digital media

## ACM Classification Keywords

K.4.2 Social Issues: Miscellaneous

## General Terms

Design

## INTRODUCTION

Diversity – of human capacities and of cultural norms – is at once a challenge to human-computer interaction and an innovative force [15,25,26]. Poverty, surely a source of great diversity, has a profound influence on ways of life and work, including, for example, access to health care, housing, education, governmental services, and, in general, information [4,12,16]. For people and communities living under conditions of relative poverty or homelessness, what

is it like to live with digital media and technology, what expectations for digital systems shape thinking and dialog, and how might digital systems be designed to improve welfare and quality of life? A body of design knowledge – principles for intervention, material and social constraints, and example systems – has begun to form that engages these and similar questions [2,18,21,23].

In this paper, we contribute to this literature with observations from an ongoing investigation into a community of homeless young men and women, aged 13 – 25, of various racial backgrounds, including Caucasian, African-American, Native American Indian, and Hispanic. Specifically, we seek to understand how homeless young people experience digital media, how systems useful to young people – and service agencies that seek to improve their welfare – can be designed, and to develop a critical discourse on the meaning and uses of digital systems by homeless young people.

Homeless young people present particular challenges for society, different from “homeless families,” “rural homelessness,” “veterans,” and other homeless populations [3,33]. Rigorous reporting by the *New York Times* [31] portrays homeless young people as vulnerable, resilient, self-reliant, suspicious of adults and institutions, and, once ensconced in homeless culture, very difficult to reach and help, even by dedicated experts. This journalistic picture is largely consistent with research which characterizes homeless young people by a present-focus on basic needs rather than longer-term goals, by a desire for self-reliance but vulnerable to older people who seek economic advantage (e.g., pimps or drug dealers), and by a general suspicion of adults and institutions but in need of help and services for personal development [4,20,27,33].

In earlier work, we reported on how non-digital information systems were used by service agencies to disseminate critical information about services and how such systems might be improved [34,35]. In this paper, in contrast, we focus on digital systems and report upon observations of homeless young people as we have coached them in activities related to finding jobs (e.g., preparing resumes, online job searching).

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### HOMELESSNESS: A LEGITIMATE WAY OF BEING OR PROBLEM IN NEED OF URGENT CORRECTION?

In a celebrated ethnography of homelessness in Seattle, WA, circa 1967, *You Owe Yourself a Drunk*, James P. Spradley stated that “the choice to remain a tramp and the choice to become something else must both be live options if we are to extend freedom to these men” [28, p. 261]. In our ongoing investigation we have come to be mindful of this distinction between homelessness as a legitimate, if perhaps temporary, way of being and homelessness as a problem in need of urgent correction.

Generally, we have found that these two perspectives frame conversations and foreground concerns in quite different ways. For example, if homelessness is a legitimate way of being, then the goal for information systems, whether digital or non-digital, might be to improve the health, safety, welfare or civic power of homeless people, to enhance people’s abilities to communicate within the homeless culture and expand its networks, or to engage with institutions (e.g., the Department of Social and Health Services). These systems can be judged useful to the degree that they help young people stabilize their situations and improve their welfare while being homeless. Consistent with this view, for example, a design initiative could address the scarcity of access to personal digital technology, which most homeless young people experience daily, develop young people’s fluency with digital technology, and develop young people’s knowledge for effective online ways of being. The *Computer Clubhouse* [23] is a program that roughly falls into this perspective.

Alternatively, if homelessness is seen as a problem to be corrected, then information systems can be judged useful to the degree that they position homeless young people to leave homelessness. Under this view, typical of service providers and society at large [20,33], homelessness is seen as a deficiency. Here, information systems are seen largely as a remedy in that they equip young people with information and skills for escaping homelessness and for participating in mainstream society. Consistent with this view, for example, is the construction of organizing schemes for brochures and fliers on a bulletin board, a common kind of paper-based information system, which allows staff and volunteers to interact with homeless young people at the entrances of drop-in centers [35]. Another example is developing information systems that help homeless young people develop skills for communicating with institutions that hold power over opportunities for advancement (e.g., employers and governmental agencies).

These two perspectives emerge from Spradley’s goal of illuminating an insider view of the sociological identity of tramps. He describes and clarifies the language of activities that make up tramp culture, including sleeping places, modes of travel, identities that are taken on in the judicial system, and so on. Through this analysis, he creates a contrast with common outsider constructions of tramp identity: “popular,” seen, for example, in the press as

undisciplined drifters and failures; “medical,” framed by the disease of alcoholism; and “legal,” framed by criminal activities. Goffman’s work on managing identity, specifically stigma, by information presentation and control is also clearly relevant [14], especially concerning how tensions that arise between insider and outsider views of the stigmatized can be negotiated. Nevertheless, curiously, Spradley neither cites nor seems to draw upon Goffman’s views of stigma in his ethnography, although he discusses at great length how institutions strip away and reshape the identities of tramps. In any case, we shall see that these two perspectives frame this investigation by creating a contrast between information systems for personal expression, that is, for “life” and information systems for escaping homelessness, that is, for “work.”

### A COMMUNITY OF HOMELESS YOUNG PEOPLE AND SERVICE AGENCIES: IN THE PUBLIC BUT HIDDEN

This work takes place within an eight-block neighborhood, adjacent to the University of Washington, a large public university with approximately 35,000 students, shaped by paths and edges, and filled with landmarks: University buildings, student housing, bars, churches, photocopying shops, barber shops, test preparation centers, cafés, apartments and single-occupancy homes, restaurants, transport hubs and bus stops, movie theatres, bookstores, doctors’ offices, traffic congested thoroughfares, pedestrian dominated streets, and bicycle paths.

Among those who live and work in this community are students of all ages and nationalities, fraternity boys and sorority girls, homeowners, academics, drug dealers, business owners, church goers, buskers, landlords, police officers, professionals, conference attendees, and proselytizers. Indeed, these actors and this sort of vibrant built environment, known as the University District, are often found at the edges of universities.

Homeless young people also live in this community. Yet, unlike these other people, they actually *live* on the streets and open spaces within the neighborhood, obtaining the resources they need, appropriating sleeping places, finding food, socializing and spending the day on the sidewalks, spare-changing, and kibitzing with passersby.

In general, in this neighborhood, pervasive access to the Internet is available. Relying on either commercial or public wireless Internet services, people with their own digital devices can be seen furiously typing into their computers in cafés, wearing fashionable music players, sharing ear-buds, uploading photos to public displays, flirtatiously fingering and texting into their cell phones, and generally socializing through digital technology. Viewing all this activity – on the sidewalk or as they enter a busy café to use a restroom – homeless young people, understandably, aspire to similar experiences.

Homeless young people are also able to seek respite from the street at nine loosely coordinated grassroots service

agencies, which are not so evident to most visitors to the University District. These agencies provide a continuum of care, from basic needs for survival – food, shelter, and clothing – to life skills development – securing state-issued identification, participating in drug rehabilitation programs, applying for transitional housing, and enrolling in community college. Unlike businesses and large-scale institutions in the neighborhood, the service locations have little or no signage, so as to not attract unwanted attention from neighborhood homeowners, businesses, and stakeholders without sanctioned interests [34]. Thus, these services are largely hidden, tucked into the corners of the built environment, operating at varying times throughout the week in multi-use or refashioned locations.

### A COMMUNITY TECHNOLOGY CENTER

At one service agency, well-known and respected by young people, we created a community technology center and a three-week series of six classes called *New Tech for Youth Sessions*. The hardware for the center was funded by a 35K grant from Washington State. Through a participatory process, involving young people, outreach workers, and case managers, we began formulating the class curriculum in November 2008. Between February and September 2009, as volunteer instructors collaborating with service agency staff, we have worked alongside 34 young people in seven different class offerings. Each author has spent at least 63 hours working directly with homeless young people, plus additional time with case managers and outreach workers, preparing and revising the curriculum, debriefing on process, and so on. (Outreach Workers are typically part-time staff, often once homeless themselves, who intercept people on the street and inform them of local services, activities, and useful contacts. Case Managers are trained professionals who work with homeless and street-involved young people and seek to guide youth out of homelessness.)

### The Physical Space

The technology center is located in a church basement that is used as a drop-in center, which is opened daily from 7:30 – 9:00 P.M. and at other times. The drop-in center provides young people with a meeting place, for talking with case managers and adult volunteers, for getting a little to eat and drink, and for respite from the street. At drop-in, staff model respectful behaviors and young people are treated with dignity, no matter their appearance and demeanor and no matter if it is their first or hundredth visit [27].

Within the basement is a rack of used clothes, free personal hygiene items, movable tables and chairs, shelves of books, a working but obsolete computer which is secured against theft within a metal kiosk and plastic shield, and a media area which is opened at certain times for watching television, and playing video games. The basement also has a restroom and a small office, with storage areas, a refrigerator, storage containers, a table for food preparation, and a sitting area. The sitting area is often used for private meetings between service agency staff and young people.

The community technology center consists of a “tech space,” a wooden counter along one wall of the basement, which holds two computer workstations connected to a fileserver and a printer, and eight laptop computers. When not in use, the laptops are stored in a locked charging cart in a storage area at the back of the basement. At present, the tech space is available only to young people who have completed the *New Tech for Youth Sessions*.

### The Curriculum: New Tech for Youth Sessions

The aim of the curriculum is to develop life skills [8] for information technology, specifically: i) The use of media for expressing goals and envisioning the future, ii) The formation and management of online identity, iii) The use of appropriate and civil language in written communication, and iv) Finding and providing information useful for achieving goals. To develop these skills, the *New Tech for Youth Sessions* invite homeless young people to move through the process of finding and applying for a job (e.g., create a small poster reflecting a dream job, produce a resume, fill in an online job application, etc.).

With four rules, the instructors create an atmosphere where discussion and sharing skills and knowledge are valued: i) Don't abuse the computers, ii) Stay focused, iii) Be respectful of others, and iv) Build on others. To instill feelings of belonging in class and an attachment to a laptop, a rare experience for most homeless young people, each student chooses a laptop that will be used throughout the six classes (each laptop is named). Pens and portfolios for holding handouts and notes are also provided.

When students arrive at a class they pick up their portfolios and laptops, both stored at the drop-in for safe-keeping, and move to a shared table with a projector. These materials and routines assist students to reconstitute their place in class. As students settle in, shifting from day-to-day street life to class expectations, they chit chat, eat a slice of pizza, hold side conversations with case managers, listen to each other's music on the laptops, check email, show each other the latest videos and material on MySpace pages, and so on.

In each of the six 90-minute classes, students produce materials that are useful for finding a job. As students work on a task, the instructors give one-on-one instruction. Once students are finished with their work, they are asked to present and describe what they did and how, which provides an opportunity to talk about themselves, an important life skill.

As students progress through the six classes they earn incentives: a 4 gigabyte thumb drive, “free time” to use the laptops during the drop-in program, a gift card for iTunes, and finally, in the sixth class, an iPod music player. The music player, coveted but scarce in this community, rewards young people for a job well done, helps to spread the word about the class, and requires young people to develop skills for using and looking after a delicate, personal device. Receiving an 8 gigabyte iPod, most of all,

gives these young people access to everyday experiences – wearing a fashionable device, listening to music in public, and shopping for and sharing music.

### Digital Media and Technological Use

Gaining access to and knowledge for technology that is used publicly by people in the neighborhood is certainly important for most of the homeless young people that we have met. We estimate that at least 75% of the students have used a cell phone, sometimes borrowed, to call or check messages, either before class or after class and it is common for young people to report that they access computers, if sometimes slow and unstable ones, at libraries, friends' apartments, and service agencies. As we shall see, young people also frequently use MySpace.

A difficulty encountered by all homeless young people is keeping digital devices, including thumb drives and music players, safe in the harsh conditions of the street. Also, it should be noted that young people may even steal or trade digital devices in exchange for illegal drugs or decide to sell a device to meet an immediate need (e.g., rent).

## INFORMATION SYSTEMS AND HOMELESS YOUNG PEOPLE: USES AND EXPERIENCES

### Method

In this section we present four examples that illustrate some noteworthy uses of information systems by homeless young people as we have observed them during the classes. In our ongoing investigation we take on the roles of “volunteer” and “researcher” at different times, with a commitment to make these two roles reciprocally beneficial in this 5-10 year project. From this commitment, and acting in the role of volunteer instructors, come three major considerations for how we report and discuss the field material below.

First, in this particular work we are not able to report direct quotations or anonymized visual material because, in the context of the community technology center, the young people we have worked with are students. We do not consent students as research participants because we will not place any barrier, real or perceived, between young people and participation in the *New Tech for Youth Sessions*. This precautionary stance is crucial because it is in keeping with the practices of our collaborators at the drop-in and because homeless young people are distrustful of adults and institutions. We do not want to begin an educational relationship with a discussion and defense of “research.” If the reader seeks vivid portraits of the lives of homeless young people, very similar to those we have worked with, an excellent source is the in-depth written and video reports published by the *New York Times* [31].

Second, it is important to note that the examples we present have arisen from a structured, educationally-oriented venue, where we have struck a balance between engaging information systems for “work” and “life.” On the one hand, the curriculum invites students to pursue activities that build skills for using information technology to find

jobs. Here, the orientation is on developing skills with information systems for escaping homelessness, that is, for “work.” On the other hand, the curriculum and rhythm of each session also provides students with many opportunities to demonstrate and discuss their own experiences with technology. Each class, for example, begins with 30 minutes of open time. Students use this time to check email and MySpace, share video and music, and so on. Then, each class moves to a “tech check,” an activity where students reflect on technology by discussing recent meritorious and problematic experiences. In the third class, to give an additional example, students consider notions of online and offline identity and discuss their MySpace pages.

Third, the examples presented below have been selected because they are noteworthy, that is, they have taught us about homeless young people's experiences with technology and illustrate some of the HCI issues at stake. The examples, moreover, illustrate the diversity of use related to homelessness, which we believe will interest the CHI community. Finally, the examples we report were observed on multiple occasions, in different ways, and took up a substantial amount of class time where young people demonstrated and discussed their particular experiences. The examples, in summary, are more than anecdotes but less than specific cases from a comprehensive typology.

### Using Digital Tools to Find Employment

In the first class, young people are asked to write 2-3 paragraphs that describe a “dream job which they would like to obtain within 2 years.” Once students complete their first drafts, they are prompted to transform their writings into posters by including images and by making use of typographical features. Students receive one-on-one coaching in the use of word processing features. Once drafts are completed, young people are asked to share their posters with the class and, taking an appreciative stance, we highlight interesting visual and content elements in the posters. The range of word processing skills, writing and reading ability, and readiness to express a goal is very wide. (Incidentally, 4-6 young people have shown an obvious need for glasses – squinting and moving their heads to within 2-3 inches of the screen.)

These skill differences re-emerge in the second class when young people are asked to prepare a resume. We have seen young people experience three major kinds of problems when preparing or updating resumes. First, young people often experience significant difficulties in using word processing features to get text formatted neatly. These difficulties are often not easily addressed – it is not unusual, for example, for a volunteer to spend 15 minutes diagnosing a formatting problem and guiding a young person to a solution. These debugging sessions, if anything positive can be highlighted, show that everyone has difficulties with word processing, and provide volunteers with an opportunity to model optimism, patience, and persistence.

Second, often, homeless young people do not have the specific information they need in order to complete their resume (e.g., names and locations of schools and businesses, dates, job titles). Sometimes, searches on the Internet can be used to find the missing information, but often the details are elusive and other strategies must be pursued; for example, contacting family members, if young people are able and willing.

Third, the problem of missing information is exacerbated by the life histories of young people – a large number of jobs of short duration, jobs that ended poorly, jobs with under-the-table payments, extensive gaps, and so on. Documenting and formatting these histories in a dignified, honest fashion can be difficult; this challenge often prompts young people to tell stories about the positive and negative aspects of their lives. The resume also can be a point for moving forward with deeply personal goals (e.g., getting a job in order to regain custody of a young child).

Young people generally envision that their search for jobs with search engines and job listings will end in disappointment. Person after person has stated that searching for a job online is useless, that he or she will not be hired, because, as homeless young people, their youth and living situations are disqualifying. Breakdowns and impasses have been seen frequently as young people queried job listings for jobs accessible by public transportation; for jobs at particular, sometimes odd times; for jobs that matched a young person's skills; and for employers that seemed to be genuinely receptive to youths' situations. Youth have often reported that they are met with indifference or hostility when they approach an employer in person. Online job searching is clearly a similar experience for this population of users.

Online job applications, the subject of the fifth class, are also challenging. Completing these applications is generally time-consuming for all young people, regardless of skill level or prior resume-writing experience. Most surprising is the number of online application forms that require the completion of a personality assessment. Young people who have prior experience with these assessments, often time-bounded and usually containing 80–100 questions, have numerous theories for how the tests work. Debate over these assessments has resulted in lively class discussions about privacy, discrimination and equity.

#### **Telling Stories with Representations of the Built World**

In conversations at the beginning of class, we have observed young people using Google Maps Street View, an application that allows users to look at addresses and other mapped locations from the point of view of a passerby. In one example, a young woman navigated to several important landmarks in her life on the street, including an outdoor sleeping place, telling a story about where she lived. In addition, we have observed young people using Google Maps to show their childhood homes and the locations of their parents and grandparents.

These mapping representations, in short, have triggered and supported the telling of stories and personal histories. One case manager has said that such technologically mediated conversations – visceral and shared – are similar to stories that arise during physical activities, such as recreational rafting, snowboarding, and climbing. Such shared experiences are considered an important step for developing positive youth-adult relationships in service agencies.

Google Maps Street View has also been used to explore the neighborhood and to view the building that houses the community technology center. The image happens to show five young men either standing, sitting or walking near the entrance of the drop-in. This image captures a common occurrence in life on the street, that of hanging out. Although their faces are blurred, all of these young men are readily identified by acquaintances due to their body shapes and distinctive clothing, which rarely changes since young people living on the street only carry one or two outfits.

When we first saw this image, knowing these young people, we were taken aback by their evident objectification. The image captures a mundane but private moment in their lives on the street. Is this a kind of surveillance? Is such imagery of the homeless different, in substantial terms, from imagery of middle class workers waiting for the bus? Could such images be used to bring unwanted attention to the drop-in? Nevertheless, despite our concerns, for some young people, to be captured in Google's system was a "badge of honor." For case managers, on the other hand, the images were problematic, but they also provided a learning opportunity for showing how youth could be empowered to request that Google take them down.

#### **Portraying Life on the Street with Video**

Using cell phones, some young people create videos and post them on MySpace and YouTube. The videos we have seen record incidents of largely innocuous behavior when young people and their friends hang out together (e.g., riding a tricycle and falling off while intoxicated, singing a song while riding on a bus, semi-nude dancing at a folk music festival). Video of relatively common street activities can, however, have unintended, negative consequences. For example, one of the YouTube videos depicted a young person climbing up the back of a city bus and riding it down the street, an action for which he was subsequently arrested. In another example, another young person showed the class a video of a parent being arrested on a "real crime" television show. Young people seem to be proud of these kinds of videos, using them to introduce something of themselves and life on the street.

In a different vein of video use, in June 2009, a local television station aired a documentary on street youth with footage that was gathered between March and June 2009. Clips of the documentary were found online and played in class. The agency staff person thought that the documentary was well-made and did a good job of representing the work of service programs. He also said that he had praised the

director for his sensitivity and understanding in depicting the lives of homeless young people.

Young people, on the other hand, held a range of views about the documentary which were generally positive except for three concerns. First, they felt that the depiction of homelessness was skewed since many of the young people in the background of group shots were no longer homeless. Second, in a related way, they worried that now potential employers and other people in the community would see them as “those homeless kids” despite the fact that many of them had already made progress toward stabilizing their lives and finding housing. Third, one young person was very upset that the final version included footage of him that he had explicitly asked not to be included. The young person wanted to share his frustration with the director, and we worked as a group to find the director’s email address. When we were unable to find the address, the staff person, who had praised the documentary, called his contact at the television station and left a message that he would like to talk with the director.

### Constructing Online Identities

MySpace and Facebook are discussed in the third class of each six-class series. Service providers were enthusiastic about including a discussion of these sites in the curriculum. They reported that use of these applications was widespread among homeless young people. In fact, approximately 100 young people have linked their MySpace pages to the service agency’s MySpace page.

Thirty-three of the 34 young people who have taken part in the classes have created a MySpace page and seem to actively maintain it, overcoming whatever barriers they may face in accessing the Internet. Young people talked about using MySpace to maintain relationships with friends both near and far and for staying in touch with some family members. Less than five young people also described using multiple MySpace accounts for different purposes.

In brief presentations we observed that all sites contained strong stances on controversial topics. The material was often presented in highly provocative ways (e.g., the inclusion of a video demonstrating a late-term abortion, violent punk/thrash music, and imagery that glorifies illegal drug use). Also, mixed within these kinds of materials were pictures of family members, poems about self and homelessness, remembrances of friends who have recently passed away, conspiracy theories, favorite music, and so on.

Young people, moreover, were clearly aware that employers and other readers were likely to form negative impressions by reading their MySpace profiles. Of these young people, some used privacy settings to restrict access. Others, to paraphrase a common view, said “the page is who I am, take it or leave it” and appeared quite unwilling to write their profile for a “mainstream” audience, similar to some bloggers [22]. For such young people, teaching how

to use privacy settings is trivial but the work required to move them to using privacy settings can be considerable.

### DISCUSSION

#### The Venue: Addressing Scarcity, Revealing Tensions

As we have seen, the examples of information system use by homeless young people arise at a particular venue, designed to address scarcity in access and limits in skills and knowledge for digital media and technology. We have sought to construct a place in which young people can also learn and teach each other, including us. Accordingly, the venue – *New Tech for Youth Sessions* at the community technology center – augments the information ecology of the nine service agencies within the neighborhood [34].

A present focus of the venue is to provide immediate assistance for finding a job. The classes, therefore, focus on job-oriented activities. These activities, our service agency collaborators asserted, would help set some of the conditions for moving out of homelessness. The venue, at the same time, is also a place for developing interpersonal life skills including goal-setting and follow-through, self-confidence, and improved interpersonal communication. For many young people, it is a significant accomplishment to show up to six classes over three weeks, to care about what’s happening, and to speak civilly throughout.

Unlike the freedom of the street, this venue presents young people with a structured, conforming place for doing “work.” This orientation is consistent with other programs in the network of service agencies which discourage certain kinds of digital media use, especially socializing through email and MySpace, and games. For service agencies, extensive game-play and interaction with “social” applications are seen as instruments of procrastination or, worse, addiction. Such applications are largely considered inappropriate because they take time away from developing in-person relationships with case managers. Furthermore, they are not considered instrumental for escaping homelessness. Rather, they are seen to be used by homeless young people to promote ideas that are socially abhorrent, perhaps used to make drug deals, to present anarchistic views, to advocate for conspiratorial theories, to participate in pyramid schemes, or to celebrate drugs or gangs.

These views are consistent with some reports of parents’ views of social networking sites [17,19]. However, the dilemma of being “simultaneously cool to their peers and acceptable to their parents” [7, p. 133] is not so important if, as in the case of homeless young people, the bond between parent and child is limited or non-existent.

Appeals, in contrast, to the possible psycho-social and developmental benefits of social networking sites [30] or to benefits of many weak ties amongst acquaintances for learning, information access, and social capital [29] were largely not made. The use of MySpace, in short, seemed to be perceived to reinforce a “street life” identity, making it even more difficult to leave the street. Research concerning

online identity presentation of emerging adults and the overlap of online and offline friends shows these intuitions to be plausible [30].

In the *New Tech for Youth Sessions* we see Spradley's fundamental difference between homelessness as a legitimate way of being and homeless as a problem in need of correction. Young people, seeking and reflecting their freedom, tend to one direction – using digital media to creatively represent their situations and identities. Service agencies, seeking to stabilize and move young people to the “mainstream,” tend to the other. Set side-by-side these perspectives reveal tensions that have been engaged throughout this work.

### Societal Expectations and Ordinary Uses

Forces, at least in the United States, seem to be moving society to a future where to participate civically, economically, and in the mainstream will require pervasive access to both public and private information, which owners control and selectively share [1,5]. Social networking sites, for example, have pervaded the lives of teenagers living at home and going to school [7] and college undergraduates [29].

Similarly, we have seen that homeless young people are participating in this trajectory, using digital media for personal expression and communication. For example, young people have frequently used digital representations, including video recordings and Google Maps, to tell stories about their daily lives and family histories. Furthermore, recall that 33 of 34 students had MySpace pages, in which they shared not only written material but also photographs and video of their lives. In addition, consistent with this data, a recent study reports that 92% of homeless young people (N=100), sampled in Los Angeles and Denver, use “technology” weekly, with social networking sites being accessed 3.8 times/week [6].

Taken together, the examples presented above, in general, are ordinary. On the one hand, from a parental perspective, just as parents may believe that social networking is a waste of time [19], so too do case managers and service agency staff. In both cases, following good intentions, a young person's access to certain applications may be frowned upon and restricted by an adult or institution (e.g., schools or service agencies). On the other hand, despite any controlling influences, like most other people their age, homeless young people, create online identities and socialize through social networking sites. Accordingly, homeless young people, like their peers, must learn to control the presentation of information associated with their identities, deciding what to make public, what to keep strictly private, what to conceal from some, how to express nuance and exploratory stances, and so on [17].

“Ordinariness,” in summary, is a prevailing theme of these examples. Young people's uses of digital media, while certainly particular to their circumstances, can be readily

extrapolated to other kinds of people and settings, especially people of similar age.

### Life on the Street: Heightened Vulnerability

We have just claimed that technology use by homeless young people is ordinary. We now turn to the extraordinary. Unlike their peers of similar age, homeless young people spend most of their days living in public view, gathering resources from the street. They have weak, if any, familial bonds. Moreover, in the absence of caring adults during childhood and early adolescence many homeless young people lack such life skills as knowing when to see a doctor and how to communicate with society's institutions.

Poverty, too, makes these young people vulnerable. Of course, with predispositions to try new experiences, sometimes risky ones, on their own or with friends, all adolescents, including those from supportive, economically secure families, face risks [10]. However, mistakes made by a young person that are easily corrected in a secure family setting may have life-long consequences for a homeless young person.

These conditions impart a degree of freedom but with heightened vulnerability. For example, on the street, people come and go and there are friends to be made, but the person who at first appears to be an ally may turn out to have malicious intentions. It is believed, in fact, that homeless young people seek to reduce their vulnerability by living in the University District, mixing with university students of similar age, and separating themselves from homeless adults, who often seek to exploit homeless youth.

By living on the street, socializing and kibitzing, a young person might be labeled a “homeless bum,” as one homeless young woman once did when referring to a student who had been in an earlier class. The person's identity and situation, however, is obviously more complex. Yet, we've seen that video and images of young people on the street can deny this complexity. At the same time, Google Maps Street View provides utility for telling personal stories of life on the street.

Using information systems to find jobs, to present and control information about identity, and to tell stories about life fit into ordinary patterns of use. The accounts given above, moreover, show that homeless young people are media producers, distributors, and re-mixers, not simply consumers. They also reveal something of the unique circumstances that homeless young people face.

On the one hand, tools for finding jobs – resume formats, job search engines, online applications – seem to present blocks of indifference to homeless young people, consistent with reports of in-person interactions with prospective employers. On the other hand, by using digital media in ways that are normal, useful, and creative within their community, they may also make it more difficult to establish footholds in the mainstream. While a service agency can help a young person prepare for a job interview,

with a change of clothes, new glasses, a haircut, and a well-crafted resume, it is not so easy to remove all digital copies of an “inappropriate” video and a network of citations to it.

Homeless young people are vulnerable to the long-term consequences of how they represent their lives in digital media. The substantial problems they experience on the street, in summary, are also present online. Yet, to dissuade homeless young people from expressing their life or to request that they “simply” change their MySpace identity is also to diminish their humanity.

**Work in Service Programs: Challenges of Diversity**

This paper began with the somewhat provocative claim that diversity is a challenge to human-computer interaction. That is, improvements to systems can arise when they are introduced to or designed for new settings of use. If so, then what does this work reveal about specific challenges when designing for homeless young people?

This work shows that substantial usability improvements could be made to systems that are related to finding a job. First, search engines and job directories could be oriented to the *specific* search needs of homeless young people, allowing young people to search on attributes that match their needs, abilities, and backgrounds. Furthermore, such systems could allow companies, non-profits, and educational organizations to declare interest in recruiting homeless young people. Second, resume builders and word processing templates could be extended to enable homeless young people to represent their backgrounds persuasively, honestly, and with dignity. Third, social software could be developed for eliciting and receiving expert and peer feedback on resumes. Finally, simulations of job application forms could be created so that young people can practice filling in complex employment questionnaires.

On the other hand, homeless young people also use digital media creatively, to express things that are important to them. By doing so, they create a record of information about their identity. In turn, as Goffman discussed at length for non-digital information systems [14], this information might need to be controlled to manage stigma.

Still, for some fundamental matters, all users of digital media are alike. Deciding to reconstruct an online identity – removing or bracketing old material and replacing it with new material – is not unique to homeless young people [24]. However, the risk of not being accepted to a prestigious college due to a bad profile on MySpace [17], would seem to pale in comparison to a homeless young person being repeatedly turned away by employers and other institutions due to a comprehensively spoiled online identity. This heightened risk arises from the nature of youth homelessness. A “harm reduction” model, whereby homeless young people receive education on the negative, long-term consequences of certain uses of digital media may be a viable approach for addressing this risk.

**Ecological Considerations for Design**

Norbert Wiener made a distinction between “know-how,” the skills and knowledge to create new things, and “know-what,” which he discussed as the *quality* “by which we determine not only how to accomplish our purposes, but what our purposes are to be” [32, p. 183]. Responding to this imperative, we have sought to identify the major forces that act upon the community of homeless young people. Figure 1 presents a framework for design and sense making, based on our research, design, and service engagements, a reading of the literature on homelessness, and reflections on the possible consequences of digital information systems as they diffuse into this community. It outlines a provisional space of tensions and opportunities for designing information systems rather than a single point.

<b>A. Societal Expectations</b>	A1. The network and data cloud are readily available to all at any time (Infrastructure)	<b>B. <u>Life on the Street</u></b>
	A2. All members of society own personal digital technology (Access)	
	A3. Quality of life will increase with digital systems use (Use)	<b>C. <u>Work in Service Programs</u></b>

**Figure 1. Framework of ecological considerations.**

The framework proposes three broad forces. First, *societal expectations*, arising from the common vision of ubiquitous computing [1,5], concern IT access. Assumptions A1-A3 seem to have penetrated the University District, suggesting a future set of conditions. In short, all citizens, no matter of economic standing, will have mobile access to public and private data. Furthermore, access, at least as promulgated by technology companies, will improve quality of life. Today in the University District those with financial means make their own arrangements for wireless internet access. Those with university-issued credentials can use the university’s wireless networks. For everyone else, the city provides free, if somewhat spotty, wireless access. While public sightings of laptop use by homeless young people in the University District are rare, the *Wall Street Journal* reports that laptops and needs for access have penetrated into some homeless communities [9].

Next, following Spradley [28], the framework also distinguishes between specific *cultural forces* which come from living on the street and *institutional forces* which come from service agencies. When on the street, young people desire freedom to pursue their own interests and experiences; often, however, as they exercise self-reliance (B1) they are put into positions of vulnerability (B2), by seeking to meet immediate, basic needs (B3). However, while service agencies are knowledgeable and accepting of homeless culture, they are focussed on the “mainstream.”



Service programs ask young people to work – to conform to civil expectations (C1), to develop caring youth-adult relationships (C2), and to develop life skills including envisioning a positive future (C3). Case managers, it should be noted, will work for months and years to help position a young person to change, knowing that walking alongside young people will rarely follow a straight path.

To illustrate the use of the framework, consider the Google Maps Street View example given above. We see that Street View introduces infrastructure (A1), enabling new interrogations of the built environment and new utility. At the same time, it also raises new questions about the meaning of privacy in public [11]. With this example, we see that homeless young people, and their hangouts, are more likely to be captured in images. Homeless young people, hence, are vulnerable to public surveillance because they spend so much time in the public (B2). Still, we have seen that Street View can also be used to tell stories with case managers, leading to the development of adult-youth relationships (C2). The framework, in summary, provides an interpretive guide, surfacing some of the tensions associated with information systems in this community.

A second example is the community technology center itself. This venue enables us to engage society's expectations for technological access and skills for homeless young people. As we have seen, it is also a place that enables us to engage the tensions that arise between "life on the street" and "work in a service program." We believe, in fact, that *any* information system for homeless young people must come to terms with these three categories of ecological considerations.

## CONCLUSION

The community technology center raises new questions about how society should involve homeless young people in digital media and information systems, as users who deserve usable access, but also as media producers and system designers. Seen as a source of diversity, this group of people presents new opportunities for human-computer interaction to expand its reach and improve the quality of life for all people.

Many specific questions remain. Research is currently underway to investigate the feelings that homeless young people hold for the iPods they have earned in class and for other small non-digital and digital possessions, accounts of their use, and their fates. Furthermore, replicating studies of social networking sites, originally conducted with teenagers living at home and going to school and college students [7,13,29,30], with homeless young people is clearly warranted. Finally, we have identified a space of opportunities for improving information systems for obtaining employment.

It seems inevitable that digital media will continue to diffuse into homeless communities. Like most young people, we have seen that homeless young people seek

digital experiences, for personal expression and for communication. This work has shown some of the ways that the circumstances of homelessness can transfer into digital expression.

Homelessness is a pressing, persistent national problem in the United States. Digital media will play a part in the solution. Yet, to be effective, we need to find ways of "bridging the gap between what users know and what they need to know," Shneiderman's third challenge for *University Usability* [26, p. 86]. The community technology center, which mixes life and work, is a venue for making progress through service, research, and design.

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