Gender, Culture and ICT Use in Rural South India

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In this article we explore how women use and perceive information technology in five villages in rural Tamil Nadu, India. We analyse the outcomes from structured in-depth interviews with 17 women Internet kiosk users and 22 women who have never used the Internet (non-users). Our intention was to systematically document the information and communication needs of women in rural South India as articulated by the women themselves. We identify several critical issues that must be taken into account in the design of information and communication technology (ICT) projects. Our findings suggest four main conclusions: (1) rural women in this study find ICTs useful; (2) there are gender-specific usage patterns and perceptions of ICTs; (3) obstacles to ICT use are generally structural (time, location, illiteracy) and not personal (for example, a prohibition from a relative); and (4) manifestations of gender awareness correlate with perceptions of obstacles to ICT use. Information and communication technologies hold great promise in the drive for development and poverty reduction in the global South, yet in order to ensure that the entire population reaps the benefits of these technologies, a clear understanding of the specific needs of women and other disadvantaged groups is imperative.

Introduction

Information and communication technologies (ICTs) hold great promise in the drive for development and poverty reduction in the global South. The social, economic and political possibilities of unregulated

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access to and sharing of information for networking, mobilization for collective action, economic development, education and individual empowerment can hardly be overestimated. A successful utilization of the information superhighway, however, is predicated on two assumptions: first, that everybody has a realistic opportunity to use ICTs, broadly defined; and second, that ICTs are designed and set up in ways that are supportive of gender and cultural differences. These assumptions matter, because without regard to the social context in which ICTs are expected to operate, they 'can deepen and solidify existing economic, political and social inequalities' (McNamara 2003: 75). Awareness of the gender dimension of new technologies is particularly important for women's empowerment, because gender biases are notoriously deep-seated and complex as Hafkin shows: 'Technologies are value-laden from beginning to end … and have been produced by Western men who do not understand the social, economic, or cultural contexts for use of these technologies' (2000: 4).

Therefore, in order to ensure that the entire population reaps the benefits of new information and communication technologies for development (ICT4D), a clear understanding of the specific needs of women and other disadvantaged groups is imperative. While the literature on gender, ICTs and development is extensive, surprisingly little empirical data exists that systematically document women's needs and concerns regarding ICTs, as articulated by the women themselves, especially in the context of rural development projects (Hafkin 2000; McNamara 2003; Rathgeber 1989, 2000; Sharma 2003). Needless to say, policy or project design without prior needs assessment, and which considers men as 'ungendered representatives of humanity' (Johnson 1997: 9), is problematic.

Consequently, the goal of our project is to increase our understanding of women-specific needs and concerns regarding ICTs. In this study, which forms a part of the Sustainable Access in Rural India (SARI) project, we explore the effect of gender on the use of information technology in five villages in rural Melur district of Madurai, Tamil Nadu, India (Figure 1), through structured interviews with women Internet kiosk users and non-users, and identify critical issues that must be taken into account in the design of ICT projects. We were motivated by the following questions: What are women's needs regarding ICT services? Are these needs met? What are women's concerns regarding village Internet kiosks, kiosk ser-vices and ICTs in general? What (or who) determines a woman's use

Figure 1
Location of Melur in the State of Tamil Nadu, India

Source: CIA, The World Factbook.

of kiosk services? Do the Internet kiosks, as they are currently set up, create an 'enabling' environment? Is a reconceptualization of the use of ICTs as tools for community development necessary?

Our preliminary findings indicate that there are, indeed, gender-specific usage patterns, and some self-identified obstacles to women's use of the kiosks. The study will be of relevance to scholars, policy makers and project designers working on ICTs, gender and development, particularly in rural areas in India.

Bringing ICTs to Rural Southeast India—The SARI Project

The SARI project is a multi-year, multi-institution research program focused on demonstrating that rural Internet can be economically self-sustainable in low-income communities and that it can lead to empowerment and social and economic development. The project was initiated

in 2000 with academic partners consisting initially of Harvard University, MIT (now replaced by Georgia Tech), and the Indian Institute of Technology, Madras; n-Logue Communications Pvt. Ltd., based in Chennai, has served as the principal implementing partner.

The SARI project has been deploying and is studying community-based village Internet facilities (kiosks) in rural areas of Madurai in Tamil Nadu. At the program's height, over 100 Internet facilities were operating in approximately 50 villages. Village size ranges from 300 to over 1,000 households. Kiosks are run as self-sustained businesses, with cost recovery through service charges. A majority of the kiosks are locally owned and operated by self-employed entrepreneurs, while some are operated by self-help groups of a local non-governmental organization. Technical support for the kiosks is provided by n-Logue Communications. The Internet kiosks offer a number of services including basic computer education, e-mail, web browsing, e-government, health, agricultural and veterinary services, mostly on a fee-for-service basis. Studies of the SARI project have focused on initial needs assessment (Blattman et al. 2003), evaluation of e-government systems (Kumar and Best 2006), and studies of the patterns of diffusion of use (Kumar and Best, in review).

Primary economic activities in the Melur area include rice production, cash crops including ochre, floriculture, and some small enterprises. A fair degree of labor motion exists in this district with men (primarily) working in nearby urban areas such as Chennai, as well as in the Gulf States and in Southeast Asia. Thus remittances form an important part of the local economy. Finally, recent failed monsoons have contributed to significant pressures on income and food security in the area.

Women, ICTs and Development

Gender empowerment and economic development go hand in hand (Boserup 1970; Elson 1995; Government of India 2001; Marchand and Parpart 1995; Nussbaum 2001; Sen 2000). United Nations Secretary-General Kofi Annan (2005) called the empowerment of women 'the most effective development tool'. Sharma argues that 'societies that discriminate by gender pay a high price in terms of their ability to develop and to reduce poverty' (2003: 1). Indeed, the annual UNDP Human Development reports of 2003, 2004, and 2005 (see UNDP 2007) consistently

show a direct correlation between the level of gender empowerment in a society, measured on the basis of women's literacy and education rates, access to healthcare, capital, means of production, and degree of women's participation in public and professional life and that country's level of economic, social and political development. The reason is clear: countries that effectively exclude women from learning, healthcare and the public sphere 'deprive themselves of the creativity and productivity of half its citizens …' (UNDP 2006) and will find it nearly impossible to close the economic gap with advanced developed nations.

ICTs have been identified as one of the most effective tools to bring about gender and economic development almost simultaneously. IT has been dubbed 'the great equalizer' (Drucker 2001), and Kelkar and Nathan (2002) optimistically argue that 'the spread of IT-enabled services has been immensely beneficial to both women and men, especially those who have limited skills or lack of resources to invest in higher education' (p. 433; see also Everts 1998; Friedman 2005; Goyal 2005; Hafkin and Huyer 2006; Mitter 2005; Nath 2001). The UNDP Arab Human Development Report affirms that 'new computer technologies offer a whole new field for women to participate in the workforce and play their part in developing the new, technologically based Arab economies on which future development depends' (UNDP 2006). Usha Sharma shows how:

> ICT … opens up a direct window for women to the outside world. Information flows to them without distortion or any form of censoring, and they have access to the same information as their counterparts. This leads to broadening of perspectives, building up of greater understanding of their current situation and causes of poverty, and initiation of interactive processes for information exchange. Furthermore, such forms of networking open up alternate forms of communication… (Sharma 2003: 1).

However, despite encouraging success stories, profound gender differences remain in the IT sector all over the world (Archibald et al. 2005; Hafkin and Huyer 2006; Mitter and Rowbotham 1995; Nath 2001; Patel and Parmentier 2005; Prasar 2003; Rathgeber 1989, 2000; Wajcman 1991). Women continue to face barriers in using ICTs, mostly lack of training, lack of access, the high costs of equipment and connection as well as

software and hardware applications and designs that do not reflect the needs of women (Arun and Arun 2002; ESCAP 1999; Hafkin 2000; Mies and Shiva 1993; Mitter 2005; Momo 2000). In the global South, in particular, these barriers are compounded and perpetuated by extreme poverty and highly patriarchal social structures, in which a strong cultural preference for boys relegates women and the girl-child to a much inferior status. This discrimination may be compounded and transferred in more subtle, likely unintentional, ways in that ICTs are produced and deployed 'by Western men who do not understand the social, economic, or cultural contexts for use of these technologies' (Hafkin 2000: 4; see also Wajcman 1991).

Women and Development—Establishing the 'Gender Link'

The key is to develop projects that do not 'upgrade' patriarchy, as it were, but recognize women's role as productive contributors to the economy. Of course, the problem that women do not benefit from new technologies as much as men do is not new. The introduction of technologies has often implicitly been designed to meet the needs of men, not of women (Basu 2000; Elson 1995; Hafkin 2000). Only after the publication by liberal feminist Esther Boserup of the classic 'Women's Role in Economic Development' (1970) did awareness emerge of a 'link' between gender and development in the development community. Until then, development programs followed a 'Western, almost Victorian, home-economic model' (Hafkin 2000: 8) that considered women primarily in their role as mothers and care givers. Programs were designed to improve the physical well-being of women, often through well-intentioned modernization projects that replaced manual field labor with artificial fertilizers, tractors, and thrashers, and put women in the role of dependent welfare recipients, because the programs planned for the training of men, not women, in the use of these new technologies.

The notion of a single globally shared women's experience of oppression and discrimination that can be overcome by either liberal capitalism or class struggle is rejected by the policy, research and activism network Development Alternatives With Women for a New Era (DAWN)

(Chowdhry 1995; Mohanty 2003; Sen and Grown 1987). Focusing on the multifaceted experiences of the women who live in the global South, DAWN embraces difference of experience as a key concept and 'articulates the desire of Third World women as tied to a yearning to be free from class, gender, racial and national inequalities, with a privileging of basic needs as basic rights. They envision a world in which one can maximize one's potential' (Saunders 2003: 12). DAWN, therefore, seeks to conceptualize simultaneous, multiple forms of oppression, while at the same time rejecting the western white image of women of color as oppressed, exploited drudges. In other words, its aim is to capture southern women's agency and autochthonous struggle against a complex web of oppression, and to identify and devise effective strategies for women's (self)empowerment.

The implications of this brief theoretical overview for our research project are clear. In order for ICTs to benefit women, women's special information needs must be ascertained, and ICT4D projects must be designed and deployed in a gender and culturally sensitive way (Sheriff 2005). Most important, effective ICT4D projects must take into account women's particular socio-economic environments, as Sharma points out, 'not the least, women's need for information are [sic] also structured according to their gendered roles and responsibilities, which, in turn influences their participation and response to knowledge networking' (2003: 3). This environment, especially in developing countries, is almost always primarily domestic, situated within a patriarchal, highly traditional society, where women are deemed to be much inferior to men and must simultaneously juggle three roles, that of primary care giver for children and elderly relatives, that of housekeeper (cooking, cleaning, gathering firewood, looking after livestock) and, frequently, that of income-earner for the family, working in the fields, as a domestic servant or selling wares and produce. Furthermore, women are often not permitted to leave their village or go to the kiosk without a chaperone. In practical terms, this means women have reduced access to training and ICT facilities because of poverty, illiteracy and social and cultural barriers, and thus have difficulty availing themselves of these potentially empowering technologies (Momo 2000; Prasar 2003).

Methodology

Our study is based on 39 structured in-depth interviews with 17 women users and 22 women non-users across four villages. These four villages have been studied closely by the SARI project, including an earlier household survey prior to the opening of Internet facilities. This survey, conducted by SARI project managers, covered 25 separate villages, four of which overlap with our study villages. In total, over 12,000 households were canvassed. Based on this initial household survey Table 1 shows some of the basic demographic indicators. This data indicates that the villages are mostly Hindu and that they represent diversity in terms of their basic level of development. It should be noted that members of the Scheduled Caste, people who in early times were referred to with the pejorative of 'untouchable', represent communities that are generally underprivileged. Roof styles are a common surrogate measure of economic development. Thatched roofs are relatively low-cost technologies (as opposed to, for instance, cement roofs).

Table 1
Comparison of Basic Social and Economic Data
of Three of the Four Villages under Study

Village Name	% Hindu	% Muslim	% Christian	% Scheduled Caste	% Thatched Roof
Keelaiyur	96	4	0	25	11
Thaniyamangalam	100	0	0	47	68
Thiruvadavur	Na	Na	Na	Na	Na
Ulagapitchampatti	97	0	2	23	27

Source: SARI household survey.

Household data for Thiruvadavur were not available. The data show villages that are predominantly Hindu. A high percentage of thatched roof construction indicates low economic development. A high percentage of Scheduled Caste members can indicate a lack of social empowerment for the village.

In each of the four villages, we undertook interviews with every woman user we were able to contact. Table 2 shows the number of known and registered women users for each village (users are tracked by the Internet kiosk operators who shared this information with us). In this table, we also show the subset of those registered women users that we were able

to survey for this study. Women users were not surveyed if they had moved from the village, were otherwise not available, declined to be surveyed, or were too young. In each village, a number of women non-users were identified and interviewed using a snowball methodology. The number of women non-users that were identified and surveyed is also listed in Table 2. This number was mostly a function of opportunity; in some villages there was more time available to survey non-users.

Women users were not surveyed if they were not available, declined to participate, or were too young.

Table 2
***Number of Registered Women Users Known in Each Village
along with the Number of Users and Non-users Actually Surveyed***

Village Name	Number of Registered Women Users	Number of Women Users Surveyed	Number of Women Non-Users Surveyed
Keelaiyur	4	1	2
Thaniyamangalam	10	6	6
Thiruvadavur	7	5	6
Ulagapitchampatti	11	6	8

The interviews were carried out over a period of one week in February 2005. The interviewer was a woman, a native of the region, fluent in Tamil (the local language), and with extensive survey experience and familiarity with these communities. The questionnaire was developed by the authors in collaboration with local experts. It contained 32 questions, separated into four thematic groups. Group One contained basic demographic questions, Group Two covered basic ICT usage data, Group Three concerned the interviewee's perceptions of ICTs, and Group Four questions asked about the women's gender awareness. The basic demographic/personal status questions asked about the interviewee's age, level of education, marital status, number of children, religious affiliation (Hindu, Muslim, Christian) community membership (Scheduled Caste, Scheduled Tribe, Forward Caste, most Backward Caste and Backward Caste), as well as their property and main source of information (own or rented home or land, own car, bullock cart, color TV, cable TV, radio, bicycle, telephone) and household information (tiled or thatched house, user of kerosene, firewood, or gas as main fuel source). Basic ICT usage questions asked were about awareness of the existence and use of the Internet kiosk,

knowledge about services offered and services used, and personal usage patterns of the interviewee and her family members (frequency and time of use). Group Three questions sought to establish the women's subjective perceptions of ICTs, and asked about their thoughts on the usefulness of the Internet, the main encountered and perceived obstacles to using the kiosk and impressions of usage and usage patterns of women and men. The gender awareness questions asked were about membership in women's self-help groups (SHGs), perception of women's empowerment, belief in the possibility or likelihood of gender equality and solicited their opinion on what changes are needed to bring about gender equality.

Findings and Discussion

The interviews carried out for the current project revealed usage patterns and perceptions of ICTs along gender lines. All women users expressed general satisfaction with the usefulness of kiosk services, as did 21 out of 22 non-users. (The single woman non-user who maintained that the Internet kiosk was not of use also stated that she did not understand the purpose of the Internet itself; interestingly, she also mentioned that her son used the Internet to play games and to check on his school exam scores.) While the interviews did not provide evidence of any systematic inability of women to use the kiosk services, a majority of the women users and non-users did point to time, interest and illiteracy as the main factors determining their non-use of the kiosk. We also found a positive correlation between the women's level of gender awareness and their perceptions of hurdles to accessing kiosk services.

Profile of Interviewed Women Users and Non-Users

The surveyed women's ages ranged from 12 to 60 years. The oldest user was 45 years. The average age of the users was 20, and of non-users 31. There was no statistically significant difference in the educational levels of the sampled users versus the non-users. Thirteen of the users and 15 of the non-users reported not having passed out of primary school. One user and two non-users had passed through secondary school. All of the women users were Hindu, as were the non-users, with the exception of one Christian. All of the users were members of Backward Castes (BC).

All but one of the non-users was BC, with the single exception being a member of a Scheduled Caste. Nearly all of the users and non-users (13 and 18 respectively) reported owning their own house, which is an indication of relative economic privilege.

Based upon village household surveys which had been conducted, we are able to compare the basic demographics (religion and caste distributions) of the village overall versus the women users. Two of the villages studied have modest Muslim populations, although no Muslim women users were noted. One of the villages has a modest Christian population (primarily converts from Scheduled Castes) and the only single Christian among women non-users under-represents this community. The Backward Castes are the most prevalent in all but one of the villages and BC community members are the most prevalent amongst women users. One village is predominated by Scheduled Caste members. In this village, a sizable minority of Forward Caste members also exists, although none are users.

Perceptions of the Kiosk and Kiosk Services

All women users reported that they thought the Internet was useful, as did all but one of the non-users. When asked specifically about the village's Internet kiosk eight users reported being satisfied with its operation and facilities, four reported being dissatisfied with the kiosk, and six declined to answer. Of the users, three felt that the kiosk's location within the village was not appropriate, one felt it needed more computers and one thought it needed women instructors.

Among the non-users sampled, nine reported having at least some knowledge of the services being offered at the kiosk. Fourteen non-users expressed lack of time as the main reason why they had not used the kiosk, 11 expressed a lack of interest, three expressed lack of sufficient literacy and three others expressed concern with the kiosk's location in the village (for instance, it was in a part of the community that they did not like to visit). Twenty non-users expressed the view that the Internet was useful, and one reported that it was not useful. Eight of the non-users stated that it was useful for education purposes; seven other non-users said that communication services were the most useful application of the Internet, two, whose spouses were working in the Gulf, specifically

noted the value of video conferencing. Two mentioned the value of agricultural or veterinarian consulting over the net; one non-user was interested in the digital photography services offered by the kiosk.

Usage Patterns: Time, Frequency, and Obstacles

We sought to establish for women kiosk users how often they used the kiosk and why they used it at those frequencies, if (regardless of frequency of use) they perceived hurdles to their use, and whether they went at specific times, and the reasons for these time choices; for instance, women might prefer to use the kiosk in the morning when the children are in school, or in the evening, after having finished with domestic chores. Such patterning might suggest impediments to their use, or alternatively, exploitable opportunities.

We found that of the 13 users who reported the frequency with which they use the kiosk, eight reported low usage (once a month or less) and five reported medium or high usage (a few times a month up to more than once every week). When asked why they did not use the kiosks more often, eight replied that it was due to lack of time, five cited a lack of interest, and one argued that the location of the kiosk (in an area she found unsuitable) diminished the frequency of her use.

We have tried to explain the variation in usage frequencies by correlating it to the users' basic demographic data. We did not find a statistically significant correlation between age or level of educational attainment and frequency of use. We did, however, find that level of income was able to explain about half of the variation in frequency of use ($\chi^2 = 12.5$, $p = .05$, $n = 12$), and in particular, all subjects who reported high usage also reported the highest income. When trying to explain variation as to why a user did not regularly frequent the kiosk we found that level of educational attainment was able to explain more than half of this variation ($\chi^2 = 14.5$, $p = .02$, $n = 14$). Indeed all users who said that lack of time was the primary reason they did not frequently visit the kiosk also reported having no significant formal education.

We asked a related, though slightly different question to the user group, namely whether they perceived any hurdles to use (regardless of the frequency at which they use the facility). Twelve of the 18 respondents reported some sort of a hurdle. When asked to identify the hurdle nine reported lack of time, three reported the kiosk location and one reported

lack of money. While only three subjects in our sample reported location as a hurdle to use, other researchers have found location to be a significant factor (Sheriff 2005). Problems with kiosk locations in these communities often stem from their location in parts of villages or towns that are deemed unsuitable for women, for instance, along busy streets, by the bus depot, in 'disreputable' quarters, or in sections of the village that are dominated by another caste group.

In an attempt to explain this variation in perceived hurdles, we studied the relationship of these variables with our basic demographic data and other measures of perception. First, and appealing well to our intuition, if a user does not perceive a hurdle to use she is likely to use the facility with more frequency ($\chi^2 = 8.5$, $p = .04$, $n = 14$); indeed, every user who reported a high level of usage also reported no hurdles. Level of income also goes a long way to explain variation in the dichotomous hurdles variable ($\chi^2 = 9.7$, $p = .04$, $n = 16$); as wealth increases, less hurdles are perceived. While age does not explain any variation in the degree to which users perceive hurdles, we do find a relationship between age and the type of hurdle experienced ($\chi^2 = 7.5$, $p = .02$, $n = 12$). Younger people tend to see lack of time as their main hurdle and older people cite location. Money was cited by a relatively broad range of respondents (from 20 to 48 years). Furthermore, we found that money was cited as the main hurdle only by respondents who also reported being in the smallest income groups.

With respect to the times at which women frequented the kiosks, we found that most (11) reported going at regular and specific times. Six of these respondents reported going for a specific class and thus on a pre-arranged schedule. Three reported going at off-peak times in order to avoid crowds at the kiosk, while two reported having to visit the kiosk at times that did not interfere with their work schedule.

Costs of Using the Kiosk Services

The cost of using kiosk services has often been cited in literature as a possible determinant in the use of ICT services. We find, however, that most of the subjects in the user population did not report costs as being a major factor. Only one woman reported money as her primary hurdle to use. Another woman when asked how best to improve the kiosk stated that currently the costs were too high for most villagers, and that the center should offer free or discounted periods for poorer members of the

community. While most of these users do not self-report cost as a major hurdle we note the finding above that only the rich women were heavy users.

When the non-users were asked why they had not used the Internet, none reported financial constraints (as reported above). However, when asked what might impede their use of the kiosk in the future, four of the seven respondents cited financial issues as at least one of their concerns.

It is interesting to note that there is a gap between men and women in the amount of money they report spending on an average per visit to the kiosk. Based upon an early survey of women and men users, women average Rs. 65 per visit, whereas men average Rs. 36.4 per visit ($n = 119$). This substantial difference in payments remains even when we control for type of service used (in other words, this gap is not due to women tending towards more expensive services). One possible explanation for the relatively high amount women pay could be that they are overcharged by the kiosk owner, and unlike men, simply do not have the bargaining power or skills to get a reduced service fee.

Views on Gender Equality and Women's Empowerment

We probed the group of users on their overall sense of gender empowerment by asking them if they are members of women's self-help groups (village based organizations that focus on providing micro-loans, skills development etc.), whether they felt that gender equality was possible, and to what extent the Internet might play a role in this. Six subjects reported being members of a self-help group; 11 were not. Thirteen responded that they had heard of women's empowerment while five had not. Of the 11 women who replied, only two felt that gender equality was possible with the rest believing it was not possible or only might be possible.

Outside of age, which had a significant relationship with self-help group membership (young subjects had not joined self-help groups), we did not find any other demographic variable that had a significant correlation with the respondents' view on gender empowerment and equality. Furthermore, we did not find Internet use (frequency, patterning, and so forth) explaining any variation in perceptions around gender empowerment (in contradiction to the cyber-utopian viewpoint that ICTs would serve as an instrument in developing a sense of gender empowerment). We did, however, find that every woman who reported not having heard

of women's empowerment reported that she perceived hurdles to her use of the Internet ($\chi^2 = 5.0$, $p = .03$, $n = 18$), and this same group reported time as the primary hurdle ($\chi^2 = 5.0$, $p = .08$, $n = 13$).

Needs: What's Wrong and What's Right with the Kiosk and Services?

When asked about their overall impressions of the kiosks and the Internet and their sense of promise and problems, there was overall optimism and enthusiasm. Every respondent ($n = 16$) responded that they thought the Internet kiosk was useful (at least in principle). Subjects argued that the facility was of use because it saves time or effort, provides relevant information, and facilitates contact outside of the village. One woman noted that she was very happy since she was able to see her son, who lived outside the district, via a webcam application.

However, when asked if the net had *already* been of direct benefit to their friends or family eight of the 14 responded that it had with six replying that it had not yet been of benefit. Users argued that the kiosks were priced too high, that government schemes need to be made more accessible at the kiosk, that there was a need for more agricultural information and that bill payment systems would be a necessary additional service. A similar question was put to the non-user subjects who also volunteered ways in which the kiosk could be improved. One subject noted that additional women's health services, home health remedies and adult computer education would be of considerable value.

A closer examination of users' responses on whether the Internet had or had not been of benefit revealed some interesting patterns. Surprisingly, older respondents stated that the Internet had been of use more frequently than younger respondents ($\chi^2 = 7.6$, $p = .006$, $n = 14$). The average age for those who responded 'no' was 20 years while the average age for the 'yes' respondents was 34 years. Respondents who claimed a benefit were more likely to be members of self-help groups and to be frequent users ($\chi^2 = 4.2$, $p = .04$, $n = 13$ and $\chi^2 = 7.4$, $p = .06$, $n = 11$ respectively), and were less likely to have experienced hurdles to use ($\chi^2 = 3.1$, $p = .07$, $n = 14$). Finally, wealthier respondents were more likely to report having enjoyed benefits from the kiosk ($\chi^2 = 4.8$, $p = .07$, $n = 12$).

When asked to turn to the wider problems of the village, the user population mostly responded that either there were no problems or that

they knew of no general problems (10 of 18 respondents). Those that did volunteer village problems cited electricity, women's education, drought, women's healthcare, women's independence and empowerment. Four respondents argued that the Internet might be able to help solve some of these problems (all other women chose not to respond to this question) by offering online education, women's health via tele-medicine, self-employment and economic development services, and the like.

Conclusions and Recommendations

The interviews carried out for this project do not provide evidence of any systematic inability of women to use the kiosk services but do reveal usage patterns and perceptions shared among female users. All women users expressed satisfaction with the Internet services, as did 95 percent of the non-users. However, most of the users stated that they were infrequent visitors to the kiosk, pointing to time, interest and illiteracy as the main factors for their infrequent use, with several women pointing to the unsuitable location of the kiosk. Surprisingly, we did not find evidence that Internet use explained any variation in perceptions around gender empowerment, which contradicts widespread assumptions that ICTs serve as an instrument in developing a sense of gender empowerment.

While general recommendations for women's empowerment are beyond the scope of this article, we conclude with three specific suggestions as to how ICT services can be improved to serve better the needs of rural Indian women. First, a significant reduction in the cost of Internet services will enable more women to use the Internet more frequently for information-seeking and sharing, education, social mobilization, selling goods and services, political organization, or, simply, entertainment, all important first steps in women's social and economic empowerment. Second, the location, management and design of the ICT kiosk should allay concerns by women and their families about potential culturally defined threats to the Internet or the facility. For instance, kiosks can be run by women operators from the village, thereby giving them an independent source of income, economic and social power, and potentially status as a role model for other village women. Furthermore, any operator, woman or man, must be sensitive to women's issues and must create an environment that is comfortable for women. For instance, designated women-only days or hours, a clean, well-lit facility with computer screens facing the

entrance, and locations in an area of town to which women feel comfortable going will make Internet use more attractive. Finally, the availability of women-specific applications, for instance, those focusing on women's or children's health, job skills and training programs will make ICT services more relevant to women's lives.

In conclusion, ICTs hold great promise for economic development and the empowerment of disadvantaged groups in the global South. Awareness of the gender dimension of access, need and use of information technologies, however, is crucial for an effective deployment of new technologies to ensure that women and men benefit equally from the tremendous potential of the information superhighway.

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