

Connecting In Real Space: How People Share Knowledge and Technologies in Cybercafés

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### Abstract

We examine how the internet brings people together not virtually over digital networks but physically while co-located in public spaces. In particular we are interested in how people in cybercafés share and collaborate with others who are physically present in the facility at the same time. We hypothesize that both explicit and implicit collaboration occurs among co-present internet users – at times intentional and purposeful while in other cases accidental, fleeting or voyeuristic. Public shared internet facilities are particularly important in low-income settings such as found in Africa. To examine this hypothesis in an African context we conducted a survey of 75 computer users at a major cybercafé, Busy Internet, in Accra, Ghana. We found that more than one-third of respondents reported some significant form of collaboration and computer sharing with friends, family members, business associates, and even strangers while in the café. Of those respondents reporting computer sharing one-half reported gaining knowledge and learning from the other user as their primary reason for sharing while only a small minority cited purely economic reasons for sharing. Those respondents who shared computers typically came to the cybercafé with more friends or associates, and generally had a better view towards collaborative group work and broader forms of interaction while in the café compared to the non-sharing respondents.

## Introduction

If the coffee shop was the quintessential public sphere for Habermas in the studies of his time (1991 [1962]), then perhaps the cybercafé today is the similarly quintessential “third place” for our time. The particularities of civic discourse aside, for some the cybercafé can serve as a rich public space bridging the virtual world with the physical. And as such it can be a place for internet users to collaborate, share, and interact among physically co-located persons. This face-to-face interaction during computer use in a public access internet facility can take on many forms, from purposeful collaborative interactions with colleagues and friends grouped around a single computer; to occasional quick questions put to café staff, friends, or strangers; to voyeuristic fleeting moments when one glances upon the computer screen of a stranger.

Our hypothesis is that co-present sharing of knowledge and technology in these public internet facilities can enhance the virtual and overall experience in many cases and for many people. Said another way, shared public computer and internet use can be *preferred* to private individualized use in these cases for these people. This challenges the common trope that public shared internet use is second-best access obligated to those who do not have the resources, financial or otherwise, to enjoy private access.

In particular we are interested in these co-located shared experiences in low-income and low-infrastructure settings where cybercafés still provide significant levels of access (physical, financial, social, and cognitive access) to many citizens (Mutula 2003). It is these settings that offer us the best context for examining our hypothesis directly; and it is also these settings where encouraging the best forms of collaborative co-present sharing may create the largest benefit.

It is important to define what we mean by *co-present sharing of knowledge and technologies* in *public access internet facilities* since these terms can suggest multiple meanings.

A public access internet facility, the “physical side of Cyberplace” (Boase, Chen, Wellman & Prijatelj 2002), is easiest to define in terms of what it is not; for our current purposes it is a place open to the general public to use computers and the internet that is *not* home, the workplace, or school. This could be for example a library, an NGO supported free drop-in center, or a commercial cybercafé. This particular study focuses on a commercial cybercafé so we will mostly confine our discussion to that narrow case though our overall thinking is wider. And by co-present we simply mean face-to-face physically co-located interactions (as opposed to say virtual interactions over the network).

Jenna Burrell (2010) has detailed a helpful model of sharing, glossing a reasonable cast of characters for such activities: the purchaser, owner, possessor, operator and user. A number of scholars have examined sharing of technologies especially in the way meant by Yochai Benkler’s (2004) with “social sharing”. This form of sharing is productive cooperation around some artifact that is necessarily non-commercial and non-remunerative. We, however, are interested in broader forms of sharing including what happens in a cybercafé where a customer makes use of a technological artifact for a fee – here the relationship between the user and the owner of the technology contains a strict financial tie. Similarly if a user requests help from an operator, the cybercafé staff in this case, there is a remunerative relationship in the sharing of knowledge from the staff member to the customer. So for us, technology and knowledge sharing entails productive work around some technological artifact that may include commercial interactions. (For the purpose of our specific survey instrument we developed a more operational definition described below.)

### Related Works

We here overview some related studies of co-present knowledge and technological sharing of phones, in schools, and within cybercafés.

#### *Phone sharing.*

The telephone is a widely shared communication technology and a number of researchers have examined the dynamics of phone sharing. Very recent work has focused particularly on non-commercial sharing of individually owned mobile phones especially under Benkler's gift economy mentioned above (e.g. Burrell 2010; Steenson & Donner 2009). Our focus on commercial forms of sharing suggests that studies of public call offices, where entrepreneurs sell time on a publically accessible telephone, are also related (Best 2008). A famous example of this form of commercial phone sharing is the Village Phone Operator made particularly notable in Bangladesh through the Grameen Phone network (Forestier, Grace & Kenny 2002; Bayes, Braun & Akhter 1999).

#### *Computer sharing in schools.*

Sharing of computers amongst students is ubiquitous, especially in low-income settings. A survey on classroom computer use within four different states in India noted that "during 28 field observations, we found no cases where only one child was at a single computer terminal." At times, as many as 10 children grouped around one computer". This computer sharing is an outcome of resource constraints as well as social and pedagogical motivations; indeed, sharing can enhance communication, collaboration, and learning.

Technical innovations have attempted to enhance the educational outcomes that arise from co-present computer sharing in schools. In 1998 computer scientists studied how students “collaborate via a shared computer with a single shared display and simultaneous use of multiple input devices” (Stewart, Bederson & Druin 1998). The computer set-up (hardware and software) which enabled co-present users to collaborate was called Single Display Groupware (SDG). In a four week long controlled experiment elementary school students were randomly asked to do similar tasks in a single input device condition, or an SDG setting with two mice. The majority of the students (85 per cent) found the shared-use setup easier, and at the same time all but one student found the shared use more fun.

Another example of technical innovation to support computer sharing in schools is a system developed by Microsoft Research where multiple mice are connected to a single computer machine (Pal, Pawar, Brewer & Toyama 2006). Each mouse controls an individual’s uniquely colored cursor on a single shared screen. In one experiment, Microsoft compared learning levels in an English language retention task between students individually operating a standard computer and groups of students using a single display, multiple mouse system. In the case of the single display groupware system five students worked together with one machine. It was found that students using the “multimouse” configurations performed equally well as those using single mouse/single user systems for this retention task. Moreover, in some cases the multimouse systems resulted in enhanced learning outcomes, for instance amongst boys when they were required to collaborate on the learning activity.

*Computers and the cybercafé.*

A few studies have helped identify the importance of public shared computer facilities especially in low-income settings. For instance a survey of 280 small and medium enterprises (SMEs) conducted across 14 African nations, found that more than half of the respondents reported that the internet was either important or very important to their business but only 18.7 per cent of responding enterprises had direct access to the net. This dramatic access gap among SMEs is closed in most cases through the use of cybercafés and other shared access facilities. Seventy-two percent of respondents that did not have direct access to the Internet were able to use cybercafés for some access.

Studies have also examined the general flow of activities and patterns of usage in African cybercafés and the rise of a cybercafé culture (Mutula 2003; Mwesige 2004). One set of papers has focused on case studies in Nigeria (Adomi 2007; Adomi, Omodeko, Otolu 2004; Ajuwon 2003).

A limited number of studies have examined the forms of knowledge sharing that occurs in cybercafés. For example Sairosse noted that people often chose internet cafés because they offer some form of IT training (Sairosse, 2003). Similarly, Haseloff (2005) examined Indian cybercafés which “can function as a center for support, education and learning about new tools and therefore could help people overcome skill deficits which would normally exclude them from access to new technologies.” Researchers studying cybercafés in both Asia and Africa noted that many people gained IT knowledge there. In a cybercafé in Yogyakarta, Indonesia 66% percent of the guests stated that they learned IT skills from friends, while 23% learned from the café’s staff. In a Tanzania study respondents tended to ask for help from the staff, altogether 44%

learned IT skills from the staff while 29% asked for help from their friend (Furuholt & Kristiansen 2007).

### Methods and Study Location

In order to better understand the forms of collaborative co-present sharing in cybercafés, and the advantages and disadvantages associated with this sharing, we conducted a survey of users in a large cybercafé in Accra, the capital of the West African nation of Ghana. The café, Busy Internet, was founded in 2001 with a particular mission to help transform the local economy to meet the opportunities of the digital age. Busy (as it is commonly called) is situated on a 14,000 square foot plot in one of Accra's busiest commercial areas and currently has 68 computers available for use as well as a 27 seat WiFi enabled lounge for clients who visit with their own laptops. Busy Internet also offers secretarial services, digital copying and printing, scanning, binding and laminating. In addition the company provides for rent in its business incubator ready-to-use office space that is equipped with broadband internet, fixed telephone lines, air conditioning and furniture.

In many ways Busy Internet is not a typical Ghanaian cybercafé. It is the largest and has the highest profile in the country and is known for a high quality of service and fast internet connections. While typically African cybercafé users are more educated and better off than the general population (Mwesige 2004), this is especially true at Busy due to its higher prices and overall formalities.



### *Subject Recruitment*

Participant recruitment and interviews commenced on 5 October 2009 and was completed successfully on 19 November 2009. All activities were conducted on weekdays, Monday to Friday, between the hours of 10:00 am to 5:00 pm. In all 75 persons of 18 years and above were interviewed. The recruitment protocol was simple: A research assistant was positioned at the exit of the café. If he<sup>1</sup> was not already engaged with a potential participant he stopped and asked every exiting customer who appeared to be of majority age if they would be willing to participate in a survey examining their experiences in the café. They were told that the survey would take approximately 45 minutes and that all respondents would receive a coupon for one and one half hours of free browsing time.

If the potential subject indicated interest they were escorted to a small office space used to conduct the interviews and were lead through a standard informed consent protocol. The survey was then conducted, the participant was thanked, and the free internet coupon was offered to them.

### *Recruitment Observations and Modifications*

While we expected that many customers would be willing to participate in the study we found that actually a large majority declined. Approximately only one in seven people approached agreed to participate in the interview. Not having available time for the interview was the main reason cited for declining to participate. Though initially the protocol was to approach any person *leaving* the café we soon began to also approach people as they *entered*. We

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<sup>1</sup> Our research assistant happened to be male.

observed that most people after conducting their activities at the café would no longer have the free time to be interviewed; furthermore, the free one and half hours internet offer was more attractive to those entering than those leaving the café.

Due to a coincidence in timing, in the first two weeks of the interviews we realized that most people who were agreeing to participate were fresh graduates from the Universities and Polytechnics who were coming to the café to check on their national service postings online<sup>2</sup>. In order to avoid over sampling from this specific category of customer we slowed the interviews for one week at which point the customer makeup appeared to return to normal.

### *Interview and Instrument Observations*

The actual interviews took on average 45 minutes per person to ask a series of multiple choice, ranking, or short answer questions along with two card sort exercises. In some instances the interview took more time as some participants were slower dealing with the question, especially those with technical terms and the card sort exercises.

Overall the interviews were conducted without incident though a number of times the process had to be suspended as respondents attended to mobile phone calls. In three cases participants left the office to attend to their calls and never came back to complete the interview.

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<sup>2</sup> In Ghana all youth must spend one year performing national service. This is essentially a government operated national internship program where detachments can be made to the private, public, or civil society sectors.

## General Results

### *General Participant Demographics and Computer Experience*

A total of 75 participants completed the survey. Of these 79% were male and 72% were 35 years of age or younger; as expected our subject pool was biased towards young men. Furthermore 70% responded that they had some form of post-secondary school education, which is considerably above Ghana's average level of educational attainment. Twenty seven percent stated that they were working fulltime for an employer, 17% were self-employed, 12% were students, and 31% were unemployed. All but five respondents were natives of Ghana.

Seventy eight percent of respondents learned to use computers either in a formal computer training program or in their school. A surprising 76% of respondents stated that they have used computers for more than five years and an astounding 60% had used the internet for more than five years. Forty two percent stated they had a computer at home while just 17% had home internet access. Finally every participant has a mobile telephone.

In summary our subject pool overall was young, male, highly educated, with considerable computer and internet experience and relatively low unemployment rates.

### *Activities at and Feelings Towards Busy*

Keeping with its reputation, the vast majority of respondents (91%) claimed Busy Internet as their preferred cybercafé. But even given this high degree of preference, only a small majority (53%) said that Busy was their most frequently visited internet cafe. This could be due to the cost, 41% of respondents said that they do not always have enough money to afford Busy's services; or location, 25% stated that they had travelled more than five kilometers to reach the

cybercafé. When asked to rank what they liked best about the café, by far the top ranking feature was its high quality computers and fast internet connection. The next most highly ranked features was its safe location and appealing layout.

When presented with a fixed set of 24 cybercafé activities and asked to specify what they commonly did while there, by far the most common activity was reading and sending emails. Next most common was searching for schools or jobs abroad followed by commercial and business activity. The next set of popular activities was social networking systems, general browsing, contacting family or friends abroad, and searching for schools or jobs in Ghana (all in that order). The least most common activity, described as unimportant by all respondents, was requesting money from others. The next least popular activities were blogs and then online dating services.

As mentioned above a segment of Busy Internet is reserved for customers working on laptops they brought with them. Forty five percent of respondents stated that they had access to a laptop (70% of them owned one outright, 18% shared with family or friends, and 11% of respondents stated the laptop they had access to was owned by their company). Of those participants with access to a laptop a full 80% had brought their laptop with them on the day they participated in the study.

### Sharing Specific Results

#### *Simple Technical Assistance*

Perhaps the most obvious knowledge sharing that goes on in a cybercafé is technical assistance sought from either the café staff or from other customers. Eighty five percent of the respondents stated they had sought assistance from the staff on technical issues and problems. Of

those who sought such assistance 75% did so “always” and the remaining 25% did it “sometimes”. This particular face-to-face interaction focused on technical problem resolution and the most common technical problems were either inoperative keyboards or slow network performance. Three other common technical challenges were attaching files to emails, downloading files onto external drives, and printing from café computers.

Beyond the staff, technical assistance was occasionally sought from other customers. Thirty five percent of participants claimed to seek assistance from friends or acquaintances while just 13% claimed to have sought technical help from strangers. Nonetheless 49% of respondents claimed to have offered technical assistance to friends and acquaintances “sometimes” while 31% had “sometimes” provided technical assistance to strangers.

#### *General Co-Present Sharing Results*

We now turn to the paper’s core results, namely how respondents described deeper knowledge and technology sharing experiences in the cybercafé and how those who did share computers or knowledge differed in who they were or how they behaved, compared with those who did not share.

During the interview, research assistants used a script to operationalize the concept of sharing for the subjects, reading: “Whenever you experience things together with someone else at this internet café we term that ‘sharing’. You may share a computer or just share the space. You may share things with friends, family members, business associates, with the staff at this internet cafe, or even with strangers.”

Thirty seven percent of respondents stated that they “sometimes” shared their computer use or activities with friends or other people while 6% “rarely” shared. No respondents claimed

to “always” share while 56% stated that they “never” shared. In our further analysis we will now consider participants who responded as “sometimes” or “rarely” sharing as *sharing respondents* and otherwise we will consider the participant as not sharing (the inclusion of the few who “rarely” share does not significantly alter reported results). We will now examine how these sharing respondents describe their collaborative interactions and then study ways in which the sharing population differs from those who state that they do not ever share.

Considering just the sharing respondents we asked them what was their most important reason for sharing. Forty nine percent said it was to learn from others, 21% said it was to share information or teach others, 18% said it was in order to offer the other collaborating person an opportunity they otherwise did not have, and only 9% said it was to share costs and thus save money. When asked who pays when the respondent shares, 58% stated that they paid the full cost, 33% said that their partner paid the full cost, and 9% responded that they shared the costs. When directly asked if they shared with others in order to save money 78% either disagreed or strongly disagreed with that statement.

We find it surprising that most respondents did not claim financial motivations for sharing. But somewhat in contradiction when they were asked if they would still share if the internet services at Busy were cheaper 57% said they would *not*. If we remove the couple people who said they did share primarily for financial savings we still find that among the respondents who state they share mostly for non-financial purposes 51% of them would nonetheless stop sharing if the costs were lower. Stated yet another way, half the respondents who share and do so primarily for non-financial reasons would still share if the costs were lower but half would not.

We asked the sharing participants what activities they did while sharing a computer with someone else at the café. Given a set of ten set computer/internet services we found that the most

popular for sharing was “learning about computers/internet” where 52% of respondents said they would “often” or “sometimes” share this activity with friends or with family. The next most popular was sports (46%), commerce and business (39%), and academic research (33%). The sharing of commercial and business activities was conducted, not surprising, mostly not with family or friends but with business associates. The least popular activities while sharing was reading and sending emails (just 5%), school exams and registration (7%), social networking (11%), and general browsing and surfing of the net (12%).

We think it is particularly notable that most of the popular shared activities among our respondents were instrumental, for instance learning about computers or doing school research. When directly asked if they shared in order to exchange ideas 87% of sharing respondents either agreed or strongly agreed with that statement. And when asked if they learned more when sharing 72% either agreed or strongly agreed. And in addition to learning, business activities were important modes of sharing with 28% of our sharing respondents collaborating with business associates on business activities. In some ways they were using the cybercafé setting as an office environment.

We asked about the mechanics of sharing. First we note that most sharing respondents, 69%, state that they meet people they know at the café and 64% say that they meet people at the café for business discussions further underlining our point above about sharing and commerce. Many (73%) also claim to typically come together to the café with people, most often their friends (48%) and only occasionally with business associates or family (8% in each case). However when asked on that *specific* day if they had come alone and, if not, who they had come with just 58% of the sharing respondents came with someone and 29% of those came with business associates.

When sharing respondents meet or travel to the café with other people most (62%) typically do not share a single computer but instead generally (90%) sit directly next to each other each with their own computer. And generally (64%) they do not follow along with what their companion is doing on the computer. Only a minority of these respondents (21%) stated that they serially use a single computer, one after the other, with their collaborator. When asked if when sharing they usually typed or moused while others looked on about half (45%) agreed and an equal number disagreed. Similarly when asked if when sharing they tried to let everyone have equal time with the computer half (50%) agreed while a bit less (40%) disagreed.

Finally, when we asked about fleeting or voyeuristic forms of sharing we did find that sharing respondents were often learning from their co-present neighbors in this way. About one third (39%) of sharing respondents admitted that they sometimes would look over the shoulder of people using a computer in the café. But a full 72% of sharing respondents stated that if they see someone next to them looking at an interesting website they will sometimes search to that same site themselves.

### *Comparing Sharing to Non-sharing Respondents*

A number of interesting similarities and differences exist between the sharing and non-sharing respondents. First we could identify no demographic differences between the sharing and non-sharing groups (all at  $p \geq 0.5$ ). The only exception is with education level where the sharing respondents were more likely to have taken their first degree post secondary school (15% vs. 9%) whereas non sharers are more likely to have gone to vocational school (9% vs. none,  $X^2(6, 75) = 14.5, p = .025$ ). While statistically significant, we are not persuaded that this is a



meaningful difference. There is also no significant difference between the two groups and their reported computer skills.

Furthermore, there is no significant difference between the sharing and non-sharing respondents as to the suite of applications they favor. There is also little difference between the two groups as to what they most value about Busy Internet except that the non-sharing respondents seem less price sensitive ( $F(1, 73) = 6.26, p = .015$ ) and are less interested in the availability (or lack thereof) of food and drink at the café ( $F(1,73) = 6.97, p = .010$ ).

The two groups did differ in whether they went to the café in a group or alone. The non-sharing respondents are more likely to state that they come to the café alone (73% vs. 31%,  $X^2(1, 75) = 12.9, p = .0003$ ) though there is no difference in the populations as to whether or not they meet people at the café. Furthermore, the non-sharing respondents are not likely to sit directly next to the person they come to the café with (10% vs. 69%,  $X^2(1, 70) = 25.0, p < .0001$ ) nor are they as likely to follow the work of the person they come with compared to the sharing respondents (65% vs. 87%,  $X^2(1, 69) = 4.78, p = .029$ ).

Finally, the groups did differ in many of their perceptions related to sharing and collaboration. When asked if they had the option to work together in a group in the café how often they would want to do this 48% of the sharing respondents reported “sometimes” and 18% reported “always” while only 29% of the non-sharing respondents reported “sometimes”, 2% reported always, and 33% reported “never” ( $X^2(3, 75) = 15.6, p = .0014$ ).

The participants were also asked a series of attitude question on a five point Likert scale from “strongly disagree” to “strongly agree” and the two groups differed in a number of their responses. For instance the sharing respondents were more likely to agree with the statements “sharing makes coming to the internet more fun” ( $X^2(3, 71) = 11.48, p = .009$ ), and to disagree

with the statement “now that I know how to search I no longer feel the need to share” ( $X^2(3, 73) = 18.0, p = .0003$ ). The sharing group was also more likely to agree with the statement “if I see someone next to me looking at an interesting website I sometimes search to that same site myself” ( $X^2(4, 75) = 12.55, p = .014$ ).

The non-sharing respondents are more likely to agree with the statement “people usually share computers because they are not very good at using computers” ( $X^2(4, 72) = 10.1, p = .039$ ) and to strongly disagree with the statement “It would be rude if I do not share my computer with others I know” ( $X^2(4, 75) = 13.69, p = .0084$ ).

Interestingly, there is no difference between the two groups when asked if they would “prefer to use a computer in private at home than in a public internet café” ( $X^2(3, 75) = 2.94, p = 0.4$ ), with a majority of respondents in both groups agreeing.

### Conclusions and Future Work

We find that users in public internet facilities make considerable and instrumental use of co-present individuals, the customers and staff that are populating this shared environment. In a survey of cybercafé users at Busy Internet, Accra, Ghana we find that every respondent takes technical questions and issues to the café staff and a third will seek assistance from friends and acquaintances who are there in the café.

More than a third of respondents engaged in richer forms of face-to-face collaborations. The most common form of such technology and knowledge sharing would be to travel together to the café with a friend or business associate and sit side-by-side. But other topologies also were mentioned including working together grouped around a single computer.

The most common purpose for this sharing was educational with half the sharing respondents stating that as their primary reason to collaborate and more than three-quarters of sharing respondents claiming that they learned more when they worked together with others. Another common collaborative activity was related to business where people would work together with associates on business matters. Few respondents mentioned non-instrumental purposes to sharing.

In addition to interacting with café staff, friends, and associates many sharing respondents stated that they would engage in fleeting or voyeuristic knowledge sharing. For instance nearly three-quarters admitted to sometimes noting the websites others in the café were browsing and then surfing to those sites themselves.

In comparing the self-identified sharing respondents to those who claimed to never share we found, not surprisingly, that the non-sharing group had a poorer attitude to group work and sharing in the cybercafé context. The non-sharing respondents also seemed less social in this space, for instance they were more likely to have travelled alone and to not sit next to people they knew in the café.

There are a number of limitations to this study perhaps most notable that the cybercafé studied is not typical of cybercafés in Ghana and the group of survey respondents is similarly not representative. Busy Internet is a large and unusually well provisioned cybercafé that charges above average tariffs. It attracts a relatively computer savvy, educated, and wealthy clientele and our subject pool mirrored this bias. In order to address this sample bias we have now conducted this survey in a small peri-urban cybercafé near Accra and our comparative analysis is forthcoming.

Having demonstrated some of the value of co-present collaboration in cybercafés through survey self-reports, in future work we would like to support (or perhaps challenge) these findings through empirical experiments. For example we envision a comparison of time-to-solution on specific computer internet tasks between co-present collaborators, virtual collaborators, and people working in isolation. Ultimately, we would like to deploy design interventions in cybercafés where we manipulate the computer technologies, furniture, and built space architecture in order to encourage and buoy the best forms of co-present collaboration.

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