

Public access, private mobile

The interplay of shared access and the mobile Internet for teenagers in Cape Town

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ABSTRACT

The study assesses and describes the interplay between *public PC-based Internet access* and *private mobile-based access* for urban teenaged public access venue (PAV) users in Cape Town. South Africa is a particularly fruitful "leading edge" environment to do this work since not only mobile use, but specifically mobile Internet use, is increasingly common even among resource-constrained young people. We combine quantitative surveys with open-ended interviews of users and PAV operators. Discussion is structured around five claims: 1) Public access and private mobiles offer different affordances, and teenage users have developed complex, fine-grained practices which help them to negotiate the respective strengths and weaknesses of the affordances. 2) The PAV provides non-substitutable impact to resource-constrained users, even those with "the Internet in their pocket." 3) Public access supports the development of digital literacies associated with hyperlinked media and large-format documents, while mobile access supports everyday social literacies and messaging. 4) Teens can use a combination of mobile and public access Internet resources to participate in networked media production and grassroots economic mobilization. 5) PAV operators can improve venue rules and skills to encourage the complementary use of the mobile Internet.

130-CHARACTER SUMMARY

For resource-constrained teens in Cape Town, the mobile Internet complements, rather than replaces, shared access to PCs.

KEYWORDS

public access, information and communication technologies, ICT, ICTD, M4D, mobile Internet, cellular phone

RECOMMENDED CITATION

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3. EXECUTIVE SUMMARY

Framing

This report revolves around a simple question: *“If you have the Internet in your pocket, why do you still visit a public access venue?”*

The mobile Internet is no longer restricted to those who can afford US\$500 handsets. It is, instead, a worldwide phenomenon, propelled both by lower-cost smartphones, and by data-enabled “feature phones” which can cost as little as US\$50. There are, of course, differences in the experience of Internet use between a simple candy bar phone and a desktop or laptop PC (Gitau, Marsden, & Donner, 2010; Goldstuck, 2010), but it is equally apparent that the mobile Internet is offering a new form of Internet access, one which promises to bring a billion or more users online (Morgan Stanley Research, 2009).

The arrival of this private, accessible, but perhaps not optimal “mobile Internet” has implications for the role (and funding) of public access venues (PAVs; Kolko, Rose, & Johnson, 2007) such as libraries, telecenters, and cybercafés. Few studies have addressed the interplay between or amongst these forms of access in a sufficiently systematic way; no one has plumbed the strategic choices made by users who are now confronted with a potential repertoire (Haddon & Vincent, 2005; Licoppe, 2004; Nardi & O’Day, 1999) of access choices. We suggest that recent assertions in the practitioner literature (e.g., Ajao, 2012; Samii, 2009) about the irrelevance of public access to PCs and the Internet in the age of the mobile are largely untested and worthy of further scrutiny. This report details results of a study in Cape Town which point to *an ongoing need and role for PAVs, even among a population of mobile Internet users.*

This study explores mobile Internet use in South Africa. Among a population of 49 million people, ITU estimates suggest there are 725,000 fixed broadband subscriptions, but over 50 million mobile subscriptions (ITU, 2011a). A comparably reliable estimate of how many of those 50 million subscriptions are data-ready and data-using is not available. Nonetheless, MXit, a Java-based GPRS “Internet-lite” chat application boasts at least 13 million users in South Africa (Bremen, 2011). Market research suggests that of 8.5 million Internet users in South Africa, 7.9 million accessed the Internet on their phones in 2011, and that 2.48 million of these used only cell phones for their Internet access. As a relatively early adopter of “mobile-centric” (Gitau et al., 2010) Internet use, South Africa is a good venue to explore more generalizable theory about the role of PAVs in an increasingly mobile age.

This study focuses on older teenage PAV users in low-income neighborhoods of Cape Town, identifying the roles of PAV and mobile use in their educational, cultural, and health-related web use and civic involvement. The consequences of PAV use for this particular demographic are particularly important, because young people confront a range of information-related challenges associated with this transitional point between school, tertiary studies, and a forbidding job market where only one in eight adults under 25 years of age finds formal employment.

We frame this emerging repertoire of Internet access using three general stances, that to users, mobile Internet and PAVs can be 1) functional substitutes 2) unrelated phenomena, or 3) complementary activities. We conceptualize the ongoing “impact” of PAVs as a shift in participation genres (Ito et al., 2010) and sociotechnical networks (Latour, 2005) for teen PAV users, with a resultant potential change in agency.

Methods

The study consisted of three activities:

1. Semi-structured interviews with **operators of 36 PAVs** in the Western Cape Province, designed as an initial scan for themes and trends.
2. Detailed interviews, activity/drawing probes, and task analyses with **53 teenage PAV users in 6 sites, including neighborhood libraries, larger “central” libraries and some cybercafés.**
3. A closed-end questionnaire with **280 PAV users** in Cape Town, focused on 1) behaviors at the PAV, 2) importance and satisfaction with the PAV experience, and 3) the role of mobile Internet for users, *via-a-vis* the PAV.

Results and Claims

There is not a single form of “access,” nor even a single institution providing “access” to the users we interviewed. There is, rather, a communications ecology, allowing the formation of user repertoires (Dimmick, Feaster, & Ramirez, 2011; Haddon & Vincent, 2005; Licoppe, 2004; Nardi & O’Day, 1999). Young people’s prior experiences and dispositions have shaped a digital “habitus,” and this results in distinct and divergent attitudes toward digital and mobile resources. We organize our analysis and discussion around five key claims:

C1A: Public access and private mobiles offer different affordances. Among low-income users, free use (such as that in a library) supports more resource-intensive goals (storage space, time, bandwidth) and stable media production, while paid use (such as via a phone) supports time-sensitive goals, various forms of inter-personal communication, and low-bandwidth media use.

C1B: Teenage users have developed complex, fine-grained practices which help them to negotiate the respective strengths and weaknesses of public access and private mobiles. These include practices that help to minimize costs and maximize convenience, and also display a keen sense of which affordances or use settings will be more productive to reach given goals.

C2: The PAV provides non-substitutable impact to resource-constrained users, even those with “the Internet in their pocket.” PAVs offer safe, quiet spaces with subsidized airtime and bigger screens. The school assignments teens are required to complete are significantly easier to complete at the PC. As one respondent put it, “all the work at school requires you to get information here at the library.”

C3: Public access supports the development of digital literacies associated with hyperlinked media and large-format documents, while mobile access supports everyday social literacies and messaging. Public access currently supports the development of interests and digital literacies associated with document production and hyperlinked media (which involves more extensive use and entails significant expenditure). Mobile access supports everyday social literacies (which require responsiveness and frequency of use) and “delinked” media use.

C4: Teens can use a combination of mobile and public access Internet resources to participate in networked media production (though not all do so) and grassroots economic mobilization (we found only a few). We observed some students who were able to combine PC/PAV resources, non-digital resources (such as teachers, friends, and family), and mobile resources in order to accomplish their school tasks. The students who displayed these behaviors were more likely to be the ones who were attending better-resourced schools outside their neighborhoods. In other words, there was a clustering of combinatory resource utilization amongst somewhat better-off students, and there was not evidence of lower-income students being able to “close a divide” or compensate for the lack of digital resources via their mobile Internet connections.

C5: PAV operators can improve venue rules and skills to encourage the complementary use of the mobile Internet. The number one thing preventing more complementary use of mobile Internet and shared access PCs is the typical set of rules in place in the venue. Nine of the 11 cybercafés we interviewed had no rules in place about cell phone use. By contrast, six of the libraries had total bans, eight said the phones must be silent, and another four specified

that phones were not to be connected to the PCs. PAV operators cited fears about viruses, as well as the concern that voice calls would disrupt quiet library spaces.

Recommendations

Part of the appeal of the library PAVs remains free (subsidized) bits, in a country where retail data through any channel remains expensive. Providing Wi-Fi in more venues might allow users to take advantage of their cell phones while waiting for machines. But the choice to institute free or subsidized Wi-Fi also has cost implications, and provisions need to be in place to fund PAVs for the cost of their bandwidth.

Young people learn through play, and they find refuge and new identities in fantasy. Given the poor quality of schooling and limited formal employment opportunities, social networks may well turn out to be crucial to their future success or survival. Free PAVs can (continue to) support activities such as games, media production and distribution, and social networking. Where possible, access rules may be adapted, and appropriate spaces may be provided for online social interaction and play, as well as individual work. Programs can focus on teaching how to use mobiles and computers in complementary ways to achieve common goals; execute cost-saving strategies; access cloud-based storage, curate collections of mobile-accessible resources for leisure and school; and host discussions about strategies for managing time, contacts, online reputation, and attention.

Some technical innovations may also help to break the computer bottleneck in free venues. Supporting Bluetooth transfer of text or images directly to phones, USB cables, up-to-date antivirus programs, and interfaces to larger screens or keyboards could be investigated, along with mobile booking, payment, printing, and web publishing interfaces.

Librarians and other PAV operators outside of those in for-profit cybercafés may benefit from specific training and encouragement to reorient them toward the opportunities presented by the mobile Internet. They will need a willingness to help PAV attendees get the most out of both the private and public Internets in their repertoires.

We acknowledge that lower cost, more powerful, and “converged” devices are coming, and we are confident that, in the future, some teens will be able to craft different strategies to take advantage of them, and to extend more of their computing habitus outside of the PAV. But in the meantime, the snapshot we offer is one of stark practical and conceptual splits between (public) PCs and (private) mobiles. We see little or no evidence that the demand for PAVs among resource-constrained, mobile Internet-using teenagers will decline in the near term. Big screens, faster and cheaper bandwidth, and the desire for a quiet, safe place to study, work, and play will remain. The steps we suggest for policy makers and venue providers can be undertaken immediately, in time to still help this generation of teens, rather than the next one.

4. INTRODUCTION

“If you have the Internet in your pocket, why do you still visit a public access venue?”

In the first decade of the 21st century, basic mobile telephony boomed, with average penetration rates in developing economies jumping from 7.9% in 2001 to 70.1% in 2010 (ITU, 2011a). The second act of the story may be upon us, with mobile Internet—and particularly mobile broadband—beginning to travel a similar path. While it is still unclear whether mobile Internet will become quite as pervasive as the basic mobile handset, it is already the case that users are adopting mobile Internet in environments and communities where PCs remain expensive and scarce. The world’s next wave of Internet users is increasingly likely to have its first and primary Internet experience on a mobile phone (Morgan Stanley Research, 2009).

The implications of this rise of a private, accessible, “mobile Internet” for the role and utility of PAVs are clearly significant (Kolko et al., 2007). However, few studies have addressed the interplay between or amongst these forms of access¹ in a sufficiently systematic way; no one has plumbed the strategic choices made by users who are now confronted with a potential repertoire (Haddon & Vincent, 2005; Licoppe, 2004; Nardi & O’Day, 1999) of access choices. We suggest that recent assertions in the practitioner literature (e.g., Ajao, 2012; Samii, 2009) about the irrelevance of the public access to PCs and the Internet in the age of the mobile are premature and simplistic, or at the very least, largely untested and worthy of further scrutiny. Instead, we offer results of a study in Cape Town which point to an ongoing demand for PAVs, even among a population of mobile Internet users.

We approach the phenomenon of mobile Internet use with an open mind; we don’t presume that mobile Internet is a substitute for public access, nor that it is irrelevant to those who use PAVs. Indeed, it may often not be the same “Internet.” In the same way that the browser is not the exclusive means of accessing “the Internet” in a PAV, the boundaries of what constitutes an “Internet experience” on a feature phone are not clear. Access modes range from accessing WAP sites in mini-browsers to running enclosed applications such as chat or Twitter clients, to downloading premium content or games from operator websites. Thus, through a combination of qualitative and quantitative methods, we explore synergies and complementarities, as well as points of possible contention. Put another way, by talking to a population of early-adopting mobile Internet users (in this case, urban teenagers), we can explore the general question: “If you have the Internet in your pocket, why do you still visit a public access venue?”

Among the wider constellation of themes under consideration by the Global Impact Study in general, this study focuses on 1) the usage of public access ICTs by people who also use the mobile Internet, 2) PAV services and operations *vis-a-vis* mobile Internet, and 3) information ecologies where mobile Internet and shared PC access are reconfigured by users as part of a broader set of communication choices.

This study explores mobile Internet use in South Africa. Among a population of 49 million people, ITU estimates suggest there are 725,000 fixed broadband subscriptions, but over 50 million mobile subscriptions (ITU, 2011a). A comparably reliable estimate of how many of those 50 million subscriptions are data-ready and data-using is not available, although MXit, a Java-based GPRS “Internet-lite” chat application, boasts 13 million users in South Africa (Bremen, 2011). Market research suggests that, of 8.5 million Internet users in South Africa, 7.9 million accessed the Internet on their phones in 2011, and that 2.48 million of these used only cell phones for their Internet access (World Wide Worx, 2012).

¹ We focus on the mobile Internet, rather than on the mobile phone more broadly, for three reasons: 1) mobile Internet is a more powerful potential substitute for the PAV than a voice call, or even an SMS. This is not to say that an exploration of SMS use would not reveal interesting and important complementarities and substitutions. Rather, it is a way to 2) narrow the theoretical focus of the inquiry to a distinct and increasingly widespread set of sub-features of the “mobile phone.” Further, 3) South Africa is a unique and fruitful place to pursue this research.

An earlier study by Kreutzer (2009) found that a majority of 11th-grade teenagers in low-income township schools in Cape Town were using their mobiles to access the Internet (either for web browsing or for chat and instant messaging) on an average day. Thus “mobile-centric” Internet use (Gitau et al., 2010) is a reality in South Africa.

We acknowledge that, as a relatively early adopter of a “mobile-centric” Internet use scenario, and as a country with particularly poor provision of state schooling, South Africa is a special case. However, the adoption patterns and trends we identify in 2010 in South Africa may manifest themselves in 2013 in India, in 2014 in Nigeria, etc. We can build generalizable theory and pattern recognition from this leading-edge case. That said, China might already be seeing the emergence of mobile-centric Internet use. Wallis (2009), for example, notes that resourced-constrained female urban migrants have begun to eschew gendered, noisy, smoky cybercafés for the control and calm of their handsets, in order to engage with China’s answer to Facebook, QQ mobile.

Research Objectives, Research Questions, and Impact Claims

We frame this emerging repertoire of Internet access using three general stances: that to users, mobile Internet and PAVs can be 1) functional substitutes, 2) unrelated phenomena, or 3) complementary activities. The middle category in the trichotomy can be expressed as the absence of both substitutive and complementary properties. These stances may vary at the feature level, as opposed to the overall level of the handsets versus the PAV (chat or web searching might be the same on both platforms, while video viewing is simply not). Thus, the trichotomy can be re-cast as a series of binary subcategories: Which features and functions of the mobile Internet are substitutes for PAV use? And which (if any) are complements to PAV use? In this way, we reserve “complementary” for active, positive amplifications of overall utility, not just coexistence in a repertoire.

This trichotomy is offered in the spirit of Chaffee’s (1982) reframing of research on mass versus interpersonal communication as “Competitive, convergent, or complementary?”, and also by a suggestion that there are distinct framings in the public access literature of public access as a *substitute* for private access vs. public access as *different* than private access (Bar & Best, 2008).

Table 1 illustrates the overarching research questions—and potential implications for PAVs—emerging from various levels of substitution or complementarity. Note that this is a simplification, since in practice, the same handset can offer substitutive value for some features while offering complementary value for others. We will use this table as a heuristic to inform the identification of clusters and patterns of behaviors according to goals and purposes, rather than around the technical artifacts themselves.

Table 1: Framing PAV and Mobile Internet Use

	If mobile Internet use and PAV use are....		
	Functional substitutes	Unrelated phenomena	Complementary activities
Overall summary	Current public access users stop coming, rely on mobile; other potential PAV users never elect to walk through the door	Reconfiguration of ICT repertoire, with some tasks to mobile Internet, some to PAV; few linkages or synergies between the platforms	An augmentation of utility and use of public ICT access
Macro implications for PAVs	Shrinking community/utility	Changing role for PAVs, requiring the reconfiguration of the array of services on offer	Positive impacts of private mobile use are not necessarily reflected in “more hours in more PAV seats,” but in successful reconfiguration and facilitation of ecology

Media convergence is partly a cultural phenomenon (Jenkins, 2006), since specific social contexts assist and motivate people to use converged media platforms. For example, these social contexts may include teen friendship networks which move to digital social networks such as MXit or Facebook, or which value the sharing of digital photos and hip-hop music; school assignments which require research and printing for projects; job application letters and CVs; or television and radio advertisements and competitions which encourage consumers to visit company websites. People do not all engage in these contexts, and thus, they do not experience media convergence in the same way. For example, some women experience discomfort in certain kinds of gaming-focused cybercafés, non-English-speaking users may be less comfortable with English PC interfaces, etc.

We conceptualize the “impact” of PAVs as a shift in participation genres (Ito et al., 2010) and sociotechnical networks (Latour, 2005) for teen PAV users, with a resultant potential change in agency. Rather than a neutral intermediary which acts predictably to bridge the digital divide, mobile Internet is an alternative “mediator” (ibid. p. 128) which introduces new dynamics and entails the enrollment of networks of technologies, semiotic resources, and interpersonal learning relationships. Consequently, this study investigated narratives of learning and change among mobile-centric PAV users in relation to their participation practices and Internet use.

We explore the extent to which configurations of mobile Internet and PAV use feature in narratives of change in teens’ genres and trajectories of learning, and how these might entail new discourses and identities for them. We focus on the forms of participation that are of conventional interest to the international development field (e.g., finding information about a university, using computers to produce school assignments), as well as non-instrumental participation (e.g., music, games, gossip with friends) that the Global Impact Study includes in its investigation (see Kolko et al., 2012 forthcoming).

Our discussions focus not only on how young people are making new connections, but also on the extent they are “routing around” obstacles or unwanted enrollments and discarding less-valued connections.

Fundamentally, this detailed study is about the renegotiation of **public** access venue use in light of increasing **private** mobile Internet use, and about the implications of this renegotiation for the continued importance (if any) of PAVs. Our inquiry has four major research questions:

1. What are the ways in which users combine and balance private mobile Internet use and PAV Internet use in a communications repertoire? For which goals/uses/affordances (if any) do PAVs remain essential and unsustainable?
2. How do social networks, affinity groups, and communities of practice mediate mobile Internet and PAV use to potential users? With what consequences?
3. Can we contrast *collocated* use (such as using the phone while at the PAV) and *separate* use (such as using the phone outside of the PAV—which could still be complementary)?
4. Which complementarities (and substitutions) are associated with higher levels of satisfaction with PAVs, or with socioeconomic/developmental impact for young PAV users? Which users are creating complementarities?

In addition, we explore some implications of this ecologies approach for PAV operators. Through our initial interviews with PAV operators, we address how non-profit PAV owners deal with the increasing availability of mobile Internet, asking about both the practices they describe and the policies they apply in their venues.

This study focuses on older teens to identify the roles of PAV and mobile use in educational, cultural, and health-related web use and civic involvement. The consequences of PAV use for this particular demographic are particularly important, because older teens confront a range of information-related challenges associated with this transitional point between school, tertiary studies, and the job market in a country where only one in eight adults under 25 years of age finds formal employment.

This study conceptualizes agency for teens as social involvement and participation. When a school pupil searches Wikipedia for information and pastes a paragraph into a document to be printed, he or she is involved in a primary communication project with a teacher (and possibly peers, group members, and parents). We see Internet users as active participants engaged in recruiting and maintaining individual sociotechnical networks, rather than as audiences “accessing” information. So rather than taking an “informational” approach, we will focus on the nature of the networks recruited, audiences developed, and artifacts created through participation in mobile-centric Internet and PAV use.

This small-scale study cannot address all possible impact-related questions. We do not evaluate whether mobile Internet *or* PAV use makes a greater contribution to addressing these needs. We believe this is a false opposition, one which sets up a comparison between a particular aspect of a technology and a complex social context. Experimental HCI-type designs which compare PC and mobile use would not grasp the social complexity of the PAV. The overall impact of PAV use is also beyond the scope of the study, as there is no control group of non-PAV users. Our approach nonetheless allows us to identify the trade-offs that teen PAV users are making between sociality, urgency, resourcing (cost, bandwidth, and hardware requirements), task complexity, privacy, and convenience.

With those caveats established, these are the claims that we make:

C1A: Public access and private mobiles offer different affordances. Among low-income users, free use (such as that in a library) supports more resource-intensive goals (storage space, time, bandwidth) and stable media production, while paid use (such as a via phone) supports time-sensitive goals and transient, shorter-form messaging.

C1B: Teenage users have developed complex, fine-grained practices which help them to negotiate the respective strengths and weaknesses of public access and private mobiles—including practices that help to minimize costs and maximize convenience—and a keen sense of which affordances or use settings will be more productive to reach given goals.

C2: The PAV provides non-substitutable impact to resource-constrained users, even those with “the Internet in their pocket.”

C3: Public access supports the development of digital literacies associated with hyperlinked media and large-format documents, while mobile access supports everyday social literacies and messaging.

C4: Teens can use a combination of mobile and public access Internet resources to participate in networked media production (though not all do so) and grassroots economic mobilization (only a few do this).

C5: PAV operators can improve venue rules and skills to encourage the complementary use of the mobile Internet.

5. LITERATURE REVIEW

This review of the literature does not address the extensive research on public access worldwide (see instead Sey & Fellows, 2009, 2011), nor even that on public access in South Africa (Gomez, Pather, & Dosono, 2012; James, Finlay, Jensen, Neville, & Pillay, 2011), but instead, it focuses on the studies and frameworks which directly inform our analysis. We situate our work within multiple and sometimes overlapping literature streams, themselves interdisciplinary, concerning 1) the particular context of ICT use and appropriation in South Africa, 2) the evolving dynamic of mobile-centric Internet use, and 3) the particular challenges facing young people in South Africa (and more broadly) in the creation of new models of literacy and digital participation.

Inequities and Gaps in ICT Use in South Africa

South Africa remains a society with extreme differences between rich and poor. In economic parlance, these differences are represented in the country's high GINI coefficient (Higgs, 2006). Similarly, as regards ICTs specifically, it is not the case that no one has access to the Internet, or to broadband, or to set-top boxes and HD-TV; rather, it is the case that some consistently do and some consistently do not. On paper, South Africa is a middle-income country with middling statistics for ICT use; in practice, it is comprised of rich communities and poorer communities sharing both overlapping and adjacent geographies, themselves undergoing dynamic processes of change, both through spatial migration and economic mobility.

These tensions and differences have made South Africa an important forward case in many studies and initiatives around digital policy and inclusion (Oyedemi, 2009). For example, community phone shops—shipping containers filled with fixed-wireless GSM lines for public access—were mandated as part of cellular/mobile operators' universal service agreements (Reck & Wood, 2004).

Beyond the policies, there are survival strategies. Among the best accounts of resource-constrained making-do with public phones and public telecenters are those provided in the papers by Skuse and Cousins (2007, 2008), which outline elements of communication-at-a-distance among rural-to-urban migrants (seeking jobs) in the cities of South Africa.

Hardware is expensive due to import duties and little domestic manufacturing. Cell coverage is good, with more subscriptions than people in 2010 (ITU, 2011a), but the most important factor may be that data, whether delivered by terrestrial DSL or by wireless GPRS edge or 3G connections, remains relatively expensive. The cost per bit is coming down thanks to the landing of new undersea cables, but the structure of only three wireless operators and one parastatal comprehensive player (Telkom) has failed to trigger sufficient differentiation and competition of price. Telkom controls the last mile of connectivity, so ISPs have a price floor below which they cannot afford to charge customers, in order to cover wholesale data rates. Domestic and corporate Internet subscriptions via wireless are frequently capped with strict monthly limits as low as 1gb per month. On the wireless side, data is purchased by bundles (similar to pre-paid airtime minutes), so the effect is also one which encourages careful attention to a "running meter" (Chetty, Banks, Brush, Donner, & Grinter, 2011).

South Africa is one of the most "mobile-centric" (Gitau et al., 2010) environments in the world with 100% mobile penetration (50 million subscriptions), but only 743,000 fixed broadband subscribers in 2010 (ITU, 2011a). As was mentioned in the introduction, a comparably reliable estimate of how many of those 50 million subscriptions are data-ready and data-using is not available; however, MXit, a Java-based GPRS "Internet-lite" chat application, boasts at least 13 million users in South Africa (Bremen, 2011), and market research in urban areas suggests that there may be 9 million unique users of the GPRS data channel (World Wide Worx, 2011).

Public access to the Internet in South Africa comes from a mix of libraries, NGO-run telecenters, schools, and cybercafés. For details, see James et al. (2011) and Pather and Gomez (2010).

Mobile Internet in a Digital and Social Repertoire of Communications

The literature on the roles mobile phones play in ICT4D and emerging markets is too voluminous to cover here. Instead, see Castells, Fernández-Ardèvol, Qiu, and Sey (2007); Donner (2008); and Pettersson (2008). Our specific interest for this study is not the mobile phone as an instrument for voice calls or even text messaging. We are focused exclusively on the emergence of the mobile Internet as a possible alternative to (or complement for) traditional models of shared PC and Internet access. That literature is smaller, although it is now growing rapidly, in particular with studies emerging from South Africa.

Some work from South Africa has identified how resource-constrained urban users are beginning to use mobiles as their primary or exclusive means of Internet access (Brown & Czerniewicz, 2010; Chigona, Beukes, Vally, & Tanner, 2009; Chigona & Licker, 2008; Donner & Gitau, 2009; Donner, Gitau, & Marsden, 2011; Gitau et al., 2010). An earlier study by Kreutzer (2009) found that a majority of 11th-grade teenagers in low-income township schools in Cape Town were using their mobiles to access the Internet (either for web browsing or for chat and instant messaging) on an average day.

It is worth singling out MXit, a low-cost instant messaging platform downloadable to many phones in South Africa, as a driver of mobile-centric Internet use. The per-message costs, just a fraction of the price of an SMS, have encouraged millions of South Africans to configure their phones for mobile data. MXit has bred moral panics, new phrases, political sagas, and so on. Although now perhaps under some stress from Facebook, Twitter, and smartphone applications such as WhatsApp and BBM, it remains a prominent force in the digital lives of young South Africans (Bremen, 2011; A. Chigona & Chigona, 2009; W. Chigona, Chigona, Ngqokelela, & Mpofu, 2009; Schoon, 2012; UNICEF, 2011; Walton, 2010; Walton & Donner, 2011; Walton & Pallitt, 2012).

Between MXit, older .mobi (WAP) sites, apps, the low-bandwidth mobile browser Opera Mini, and full web browsers, there are actually a variety of ways to configure mobile Internet experiences in the South African context (and beyond). Goldstuck (2010) describes this range thusly:

- “Tier 1: The WAP Internet (access to WAP gateways, which includes mobile versions of brand sites, mobile versions of traditional and new media publisher sites, downloads of ringtones, games and other content, which may only involve a single link from the phone; the typical user of the WAP Internet is not always aware of using the Internet).”
- “Tier 2: The Mobile Application Internet (usage of ‘stand-alone’ applications on the phone that rely on data feeds, such as MXit, Gmail, and Maps; the typical user is aware of using data, but not of fully accessing the Internet).”
- “Tier 3: Mobile Web Browsing (usage of a web browser to access the World Wide Web from the phone—understood by most users to represent full Internet access).”

Data-enabled content on mobiles can be used as parts of interventions, bringing multimedia content outside the realm of the four walls of a telecenter for appropriation and use by a broader community. Notable examples here include the mobile voices project in Los Angeles (Bar et al., 2009) and other work on mobile literacy (Walton, 2010), counseling (Nitsckie & Parker, 2009; Parker, Wills, & Wills, 2008), and tutoring (Botha, Batchelor, & Ford, 2009) services offered in South Africa.

Given the recent arrival of the mobile Internet, it is logical to assess its use by South Africans not as a standalone phenomenon, but rather, as part of an evolving communication repertoire (Haddon & Vincent, 2005; Licoppe, 2004; Nardi & O’Day, 1999). This fundamental perspective is one of the core pillars of this inquiry—that South Africans will elect to use the mobile Internet, as understood by and available to them, in ways that complement and maximize the usefulness and appeal of their other communication choices, both digital and analogue. Hence, this work has many analogies with other projects, including studies of the “information have-less” in China (Cartier,

Castells, & Qiu, 2005; Wallis, 2009) and of making do in Kenya (Smyth, Kumar, Medhi, & Toyama, 2010), as well as others in Argentina (Larghi et al., 2010) and throughout Africa (Slater & Kwami, 2005).

Interplay Between PAVs and Mobile Internet

Despite the steady publication of studies offering descriptions of the status of either 1) shared/public Internet access or 2) mobile Internet access and use in South Africa, there are very few which address both elements simultaneously, in ways which would allow an assessment of whether shared access and the mobile Internet are merely co-present, competitive substitutes, or actively symbiotic.

A few pieces in the broader practitioner literature have begun to articulate a stance that the PAV, specifically the not-for-profit telecenter, is rendered obsolete by the mobile phone (Ajao, 2012; Samii, 2009). At this stage, such “either-or” framing is probably overly simplistic and not productive. There are very few rigorous studies which address mobiles and PAV use simultaneously, but consider, instead, a few evidence-driven pieces which have begun to explore trade-offs and complementarities.

In Canada, McEwen and Scheaffer (2012) call for a more welcoming, complementary environment for mobile phones and the mobile Internet in university research libraries. In India, Prasad and Ray (2012) compare telecenter and mobile (not mobile Internet) use by men and women, finding that, while men could access and use both (as complements), women could not, as they had limited access to mobiles. In South Africa, Chigona, Lekwane, Westcott, and Chigona completed a single-site study of a shared access facility in Cape Town, concluding “that there was still a need for shared computing facilities, despite the growth of mobile technology” (2011, p. 12). Our study expands on the approaches established by these initiatives.

Digital Habitus

Public discourse about ICT use often labels educational uses of ICTs “good” or “correct,” while other orientations toward ICT use are branded incorrect, a waste of time, or downright dangerous. Such normative assumptions ignore the social inequalities which give rise to different patterns of consumption, as well as the distinctive identities and institutions shaping differences in disposition, practice, and access. In fact, socioeconomic disadvantage influences both the worldview and resources required for the use of computer technologies (Hsieh, 2011). It is not surprising, then, that socioeconomic status predicts how people use the web in everyday life (Hargittai, 2010), consequently creating relationships between socioeconomic inequality and digital inequality. In an attempt to explain these relationships, researchers have borrowed the term “habitus” (Bourdieu & Wacquant, 1992), positing that a “digital habitus” (Carrington, 2005) or distinctive attitudes or orientations to ICTs are formed particularly during childhood, but also in later life. Australian researchers have found that, in particular, a class inflected habitus, or disposition toward education, contributes to the formation of digital tastes (North, Bulfin, & Snyder, 2008). Studies of habitus in the context of student technology use in South African higher education have identified differences between “mobile-centric” and “computer-centric” orientations to digital practices within the field of higher education (Czerniewicz & Brown, 2010), suggesting that, although phones are used almost universally, computer users enjoy a wider range of choices and greater convenience. Mobile-centric students are relatively disadvantaged, although the transition to academic uses of digital technology may be assisted by their prior digital habitus formed by a history of using mobile phones.

This broad approach shows the continuities between technology use and an overall habitus shaped and reproduced through household, class, and social histories. Our study contributes to these explorations of the connections between class and digital habitus by pointing to the fields of engagement which have shaped young people’s everyday mobile habitus within a broader “kasi habitus” (Schoon, 2012), or the often conflicting

orientations toward street life, shebeens,² sexuality, social relationships, home life, and education experienced by young people growing up in South African townships (Swartz, 2009). We try to validate the importance of this habitus by not equating it with the mobile habitus of the web 2.0 digerati. Normative perspectives fail to ask what value users find in their existing practices, thus potentially missing strategic appropriations (and refusals) of changing consumer technologies. The significance of existing digital practices is lost when researchers emphasize “lack,” “deficit,” or “incorrect” use in what is simply a divergence from middle-class norms, goals, or uses which may involve change, agency, and subversive or transgressive cultural appropriations (Bar, Pisani, & Weber, 2007; de Souza e Silva, Sutko, Salis, & de Souza e Silva, 2011; Wasserman, 2011).

Promises to “bridge the divide” through consumption of information technology normalizes an educationally oriented middle-class digital habitus, along with its uses for computers and phones. Phones can be used for participation which supports young people’s social mobility, academic endeavors, and search for employment, but they are equally used in practices emphasizing non-elite solidarities and identities (Chiumbu, 2012), or which sabotage, shame, and restrict, rather than enhance mobility (Schoon, 2012; Walton, Marsden, Hassreiter, & Allen, 2012).

In this way, as Kvasny and Keil (2006) have argued, the concept of habitus allows for creativity and agency, but it also helps to conceptualize the link between technology change and the perpetuation of inequality, and it can also explain the failure of projects which aimed to “bridge the digital divide.” The provision of access and skills often reach a dead end when the social circumstances for transformative use were not so easily provided:

When people embrace these initiatives, they are full of enthusiasm, and there is no question that some learning occurs and that the programmes are beneficial. However, there is no mechanism for people to go to the next step, whether that is technical certification, going to college, buying a personal computer or escaping the poverty that put them on the losing end of the divide in the first place. (ibid., p. 23)

Young People, Computers, and Literacy in South Africa

This project identifies the role played by PAVs in extending access and opportunities for participation to young people from low-income areas. Beyond documenting the undeniable contributions of these venues, we explore the literacy practices of young people whose digital habitus centers around uses of mobile phones for interpersonal communication, how the genres of participation which they adopt online both differ from and overlap with middle-class informational and computer-based norms, and explain how they might struggle to achieve the successes possible for their better-off and more redundantly networked peers in other contexts.

Although many South African families are extraordinarily committed to education, there is no easy fit between literacy practices in their homes (Stein & Slonimsky, 2006) (Stein & Slonimsky, 2006) and the practices rewarded at school and the workplace. Unequal access to good teaching and educational facilities still testify to the racial policies of the apartheid past, although class distinctions now determine who can access the well-resourced schools. In most South African schools, books, libraries, and computers are also scarce (Bloch, 2009). For example, of the 24,979 state schools in South Africa, only 1,801 had functional libraries, all of which were better-resourced schools funded by relatively high school fees (Equal Education, 2010). From a new literacy studies perspective (Barton, 1994; Street, 1993, 1995, 2001), schooled literacy practices in impoverished state schools are distinct from those valued in the elite schools of the middle classes (Fleisch, 2008).

² In South Africa, the term “shebeen” refers to a bar or pub, usually in a township. Under apartheid, Blacks were forbidden from drinking in bars reserved for Whites, and in townships, unlicensed shebeens were mostly makeshift taverns operating illegally.

This enduring division between a few high-performing schools and the majority of under-resourced institutions is also reflected in students' differential access to and use of PCs and the Internet. Most schools, until as recently as 2005, had no access to digital technologies; despite some recent additions, pencil and paper-based work, chalkboards, and print practices still dominate South African state schools. Thus, many South African children encounter computers and PC-based Internet primarily in the context of under-supplied public libraries, or through the circumscribed classroom practices associated with school literacy drills (Pallitt, 2008; Prinsloo & Walton, 2008; Walton, 2010). Most teachers, particularly those trained in earlier decades, are thus in the very early stages of an adoption curve.

In terms of student access to PCs and the Internet, the Western Cape outpaces much of the rest of the country. All libraries in Cape Town are equipped with computers and Internet access via the City's SmartCape project, which allows all patrons a daily allocation of free Internet access. The participants in this study are also likely to have benefitted from the Khanya project, a rollout of computer labs to all schools in the Western Cape. Nevertheless, there are simply not enough PCs or Internet access points to go around in the average resource-constrained school in the Western Cape. School PC access even under these better-than-national-norm conditions remains so constrained that we found long queues of teens waiting for their turn to use the SmartCape PCs in the library every afternoon and on weekends, while others turned to cybercafés, and other PAVs to augment access at school and at home.

For more work specifically on literacy, ICTS, and South African youth, see Bosch (2008); Butgereit (2007); Chigona and Chigona (2009); Chigona, Chigona, Ngqokelela, and Mpofo (2009); Chigona et al. (2011); Deumert and Masinyana (2008); Kreutzer (2009); and Walton (2010).

Genres of Participation

Understanding forms of participation and learning as young people pursue friendships, academic work, and other interests online in South Africa requires a shift from Northern assumptions. Apart from the pervasiveness of mobile access, online participation in the South African context also needs to be understood against the background of extreme class and geographical mobility, marginal economic activity and high unemployment, poor schooling, dramatic differences in access to resources, and the presence of large ghettos which trap many in a social situation that resembles a local "underclass" (Seekings & Nattrass, 2006). Northern or middle-class experiences of young people's online participation are helpful as a starting point, but they must be expanded and modified to account for specificities of the South African context. In this way, this work may inform not only understandings of online participation by South African youth, but also the body of theory associated with teen online participation in general (Ito et al., 2010).

In the United States, young people engage in various distinctive modes of online social participation (ibid.). New and often youth-defined "genres of participation" or conventions of interaction have emerged in social network sites or are associated with the digital production and sharing of user-generated content. Researchers who are interested in the processes of informal learning through new media distinguish between "friendship-driven" and "interest-driven" genres of participation (ibid.). These two genres of participation are characterized by distinctive social network structures, modes of learning, and associations with youth culture. For Ito et al. (ibid.), "friendship-driven" participation supports and develops everyday interactions and relationships with friends and peers, and as such, it constitutes the key source of connectedness in relation to friendship and romance. By contrast, "interest-driven" participation resembles Gee's (2003, 2005) notion of "affinity spaces," in that this form of interaction supports the development of more specialized, niche, or marginal activities and identities, potentially leading to the development of academic or profession-focused interests and skills.

Family strategies and socioeconomic differences shape children's introduction to the use of new media. Despite widespread access in the United States, Ito et al. find that "new media continue to contribute to the production and reproduction of class and gender inequities in American society" (2010, p. 171). In the United States, within the home, middle- and working-class families regulate children's use of digital media and cell phones in complex

ways, reflecting a range of different (although not exclusively class-inflected) orientations toward media use and education. Parental strategies are also influenced by the availability of resources such as money to redesign homes, space to allocate to children's media use, and parental time for supervision. Access to networked peer production has major significance for some working-class teens in the study by Ito et al. These teens are able to use technical and media expertise to access work and engage in "grassroots economic mobilization" (although the researchers note that finding paid work was rare among their study participants). Networked peer production evinces stronger continuities with the way in which amateur media activities have traditionally allowed primarily middle-class and elite kids to develop creative talents and gain an understanding of themselves as workers in various volunteer and unpaid contexts. Thus these more privileged young people may be more likely to benefit from the new and mostly unpaid and nonmarket opportunities to experiment with work and academic or professional identities via their participation in online interests (ibid.).

We will use the friendship-driven versus interest-driven lens to examine differences in teenage uses of ICTs in a repertoire, and we will argue in detail that the kinds of activities undertaken on different platforms often break strongly across these lines, with private mobile supporting 'lighter' modes of friendship-based participation via messaging and media production, while public venues allow print production and more resource-intensive interest-driven online activities, as well as an additional genre of support-driven interactions with sponsors. To foreshadow our conclusions, this observed cross-platform skew in behaviors and goals undermines hopes that the "mobile Internet"—at least as currently consumed and used in resource-constrained communities in South Africa—can truly substitute for the complex network of resources involved in PAV use.

Born in 1994

Many of the participants in this study were born in 1994, the year of South Africa's first democratic elections. These young people have grown up in an era of dramatic social change, which has allowed increased upward mobility to millions of Black households in the growing middle class, just as massive growth in unemployment has plunged many others into poverty.³

Educational and work opportunities have opened up dramatically in this period, interracial inequalities have declined, and massive state expenditure has attempted to equalize state spending on schooling. In this context, the route to middle-class status seems, suddenly, to be tantalizingly within reach for young people of color (Bray, Gooskens, Kahn, Moses, & Seekings, 2010). Between 1991 and 1996, for example, the number of "middle-class" African households rose by 78% (Seekings & Natrass, 2006).

At the same time, economic disparities established under apartheid have shifted into class divides which have persisted and perhaps even deepened under democracy and economic neoliberalism. The brunt of both growing unemployment and HIV/AIDS has been borne by impoverished Black communities (ibid.).

Increased state expenditure on schooling has benefitted middle-class teachers more than it has improved the quality of education for poor citizens, and many "failing" schools simply reproduce disadvantage. Access to opportunities for employment form an increasingly scarce resource (ibid.), one which is informally distributed via social networks. Unemployment clusters in households, and consequently, many of those who are unemployed have no social or other forms of capital with which to get a job. Unemployment is particularly serious for young people, who leave school facing national unemployment rates of 25% (Statistics South Africa, 2011). Of these

³ We use the racial terminology associated with the apartheid era not to endorse such categorization, but because it indexes the continued ethnic, class, and linguistic inequalities in contemporary South African society. The term "African" is used to refer to the distinctions created by the apartheid regime between Black Africans and other disadvantaged groups in South Africa.

unemployed South Africans, 72.3% are 34 years old or younger, 60% have not completed their schooling, and those who do not find a job by the age of 24 are unlikely to ever find one (Patel, 2011).

In this context, then, friendship-driven online interaction has the potential to be a key source of support for young people on their treacherous passage through the education system. If they are not successful at school, where the playing field is still stacked against them, given declining rates of formal employment, their skills in making the most of contacts in their social networks are likely to be their major sources of access to opportunities for employment or income. At the same time, within the township context, unplanned pregnancy, alcohol and drug abuse, and crime can all too easily derail the most determined young people. Interactions with peers and adoption of *ikasi* (township) style and the youth mores of peer culture are key to peer acceptance, yet they also pose distinct threats to ordinary young people's dreams of educational or financial success (Swartz, 2009). Under these circumstances, it can be argued that formal education, rather than being an assumed norm accessible to all, involves a kind of special interest-driven participation. Success requires young people to resist going along with peers who are disaffected from schooling, and to stay connected to those who share their academic interests. Ideally, they need to find a way to develop interests or networks that connect them with the worlds of work and higher education—worlds to which their peers are unlikely to be connected, and from which their own families are often excluded. Unfortunately, South African social networks currently do not connect most young people with the bounty of opportunities and educational resources in their society.

Given this context, the particular group of young people we recruited from libraries and Internet cafés in Cape Town are positioned in a very specific way within township society. Most are making choices to stay on track, focus on their studies, and use whatever resources they can muster to achieve their dreams of academic success and employment. As such, many of the library and cybercafé users we interviewed might be considered *ulungileyo*, good influences or “right ones” in the township peer ecosystem described by Swartz (*ibid.*), or even sheltered “mommy’s babies” out of touch with *ikasi* style and mores (*ibid.*).

Their stories, choices, and strategies are particularly important ones. Many are skilled users of the ICT repertoires at their disposal; their narratives illustrate the important continuing role of PAVs as a resource for academic literacy and its possible expansion to support interest-based communities and content production. They also highlight the corresponding persistent shortcomings of the mobile Internet as currently experienced. While some stories show mobile communication opening up opportunities for young people, many stories conflict with the rhetoric of a closing digital divide and the demise of the PAV.

6. METHODOLOGY

The study consisted of three activities:

1. Semi-structured interviews with **operators of 36 PAVs** in the Western Cape Province, designed as an initial scan for themes and trends.
2. Detailed interviews, activity/drawing probes, and task analyses with **53 teenage PAV users in 6 sites**.
3. A closed-end questionnaire with **280 PAV users** in Cape Town, focused on (a) behaviors at the PAV, (b) the importance of and the users' satisfaction with the PAV experience, and (c) the role of mobile Internet for users, *via-a-vis* the PAV.

The theoretical target population is urban teens from low-resource, historically disadvantaged populations in South Africa. In practice, 1) and 3) covered all users, while 2) (the open-ended interviews) focused specifically on teenagers.

The operator questionnaire and qualitative user interviews were designed to dive deep, in largely exploratory ways, into the leading edge of an unequally-distributed phenomenon. For the sake of cost and relevance, we went to where we would be able to recruit more mobile Internet users, and to the venues which are still serving them. Consequently, our sample is an urban sample, although we also interviewed three telecenter operators in rural towns in the Western Cape. While rural access is a major concern of the overall Global Impact Study, we have not explored rural uses of mobile Internet for this study.

All questionnaires and sampling/recruiting procedures were prepared in accordance with University of Cape Town regulations for research with human subjects.

Operator Interviews

We conducted semi-structured qualitative phone or in-person interviews with 36 PAV operators in the Western Cape (11 cybercafés, five telecenter/NGO facilities, and 21 libraries). The list of libraries with PAVs was provided by the SmartCape administrators, and permission was granted by SmartCape to speak with the librarians. We selected sites at random from within the subset of sites located in low-resource neighborhoods, plus the two central libraries at Central and Bellville. Telecenters and cybercafés were recruited using a convenience and snowball sampling method, focused on low-resource neighborhoods in Cape Town.

The interviews were the same in the phone and face-to-face conditions, with the exception that photos were taken in the face-to-face site visits. Questions focused on how PAV operators were taking mobiles and mobile Internet into account in their procedures and services. We asked about notable trends and user behaviors, as well as any mobile use in or around PAVs that is intentionally encouraged by PAV operators. Interviews were conducted in languages comfortable to respondents (English, isiXhosa, or Afrikaans). These brief 15–20 minute interviews were recorded, transcribed, and translated, and then entered into Excel for analysis. Face-to-face interview participants were provided an honorarium in the form of airtime, at ZAR40 (US\$6).

Detailed Teenage User Interviews

In phase 2, we recruited 53 teenage participants from a range of PAVs around Cape Town, primarily the public libraries in Delft (14%) and Langa (14%), Cape Town's Central Library (13%; situated near Cape Town Station, a major bus, taxi, and train transport hub in the Central Business District [CBD]), and the African Axess Internet Cafe in Langa (11%). While choosing venues for the study, two additional pilot interviews were conducted at Silulo Internet Cafe in Khayelitsha, and at the public library in Rylands.

Venues were selected partly in order to provide insight into a mix of governmental and commercial operators, the different contexts associated with paid and free access, and a range of social circumstances across diverse contexts in Cape Town, as well as to allow us to interview both Afrikaans- and isiXhosa-speaking participants (who were mostly multilinguals). Final decisions about the choice of venue were also based on such factors as whether the venue offered an adequate space for the interviews. Participants were thus recruited from both free venues (54.7%) and venues that required them to pay to either use the PCs or get there by public transport (43.4%).

Internet cafés provided a range of services, and they charged a relatively low hourly fee for use of the facilities. Local libraries allowed free usage, although a membership fee was required to join. The central library was also free to use, but visiting it entailed transport costs, and so it is not considered a free venue for the purposes of this study. Although relatively small, none of these costs were considered trivial or negligible by the participants.

The exact arc of the interview and interaction with the teenagers varied between venues and cases, depending on the availability of PCs, the safety of bringing a mobile to the venue, time, and the evolving needs of the project. Any given interview consisted of some or all of the following:

- Semi-structured interview on PAV and mobile Internet behaviors, with an emphasis on the task or activity which had led the participant to come to the venue.
- Assisted drawing of a “mind map” or project network diagram detailing the sociotechnical resources recruited for the participant’s most recent school project, including how tasks were accomplished on the PC and the mobile (Mavers, 2002; Pearson & Somekh, 2003).
- Hypothetical or actual task analysis, videotaped, with the interviewer and translator (if required) video recording a facilitated task analysis using the “think aloud” method (Benbunan-Fich, 2001; Olmsted-Hawala, Murphy, Hawala, & Ashenfelter, 2010) involving tasks on the PAV site computer or the mobile handset.

These observations were combined to elicit learning narratives, which allowed users to explain how and when they learned the practices we observed, and also to explain their importance.

Participants were provided an honorarium in the form of airtime, at ZAR15 (US\$2).



Figure 1: Fieldworkers Minah Radebe and Silke Hassreiter conduct task analysis and interviews.

The group included 24 young women (45.3%) and 29 young men (54.7%) who ranged in age from 13–19 years old, with an overall mean age of 17.0 years (SD 1.0).

A substantial number of participants relied on the income of a parent employed as a domestic worker or farm worker, or working in the informal sector selling clothing or food. An additional group depended on some other member of the extended family for their support. Six participants reported that the parent with whom they lived was unemployed and did not mention any other source of support. Although we did not probe their sources of support, these households probably relied on government child support grants or old-age pensions. Just over a quarter of the sample reported that their parents were employed in (lower) middle-class occupations, as teachers, nurses, company supervisors, librarians, market researchers, policemen, or civil servants. The remainder of those supported by a parent's formal employment mentioned working-class occupations, such as cleaners in large corporations, supermarkets, or educational institutions. Only one mentioned that a parent worked in a factory.

Interviewees attended a wide range of different schools in Cape Town (29), mostly secondary schools, but also a few primary schools and post-school colleges or training institutions. Just over half of the participants (58.5%) attended schools situated outside their local township area. The families of these participants were allocating additional resources to pay for transport and higher school fees, sometimes for semi-private ("Model C") or private schools. In a couple of cases, schooling was subsidized by an individual or corporate sponsor. In the absence of more detailed information about participants' household income and household size, attendance at the local township high school (primarily in Langa or Delft) was used as a rough indicator of the family's lower socioeconomic status.

Our sample, small and non-representative, is also likely skewed toward the lower middle classes who seemed more likely to be using the venues. The sample nonetheless reflects some of the important social dynamics in Cape Town townships at this point. The relatively high number of parents with lower middle-class occupations suggests growing access to middle-class occupations. At the other end of the spectrum, it also testifies to declining rates of traditional working-class employment, high levels of activity in the informal sector, and growing unemployment. Our sample also reaffirms the key role of extended families in sustaining those affected by unemployment.

PAV User Questionnaire

In phase 3, we conducted a survey using a questionnaire with users at each site, with a focus on 1) validating and quantifying trends/issues/patterns found in qualitative exploratory interviews, and 2) statistical clustering/association of various mobile and PAV behaviors and attitudes, as well as the role of one's mobile as driver to PAV. By this point, we were able to ask simple questions which came closer to the thumbnail theme of our questionnaire probe: In some ways, the impact of the PAV is revealed in the answers to questions like this: "If you have Internet on your pocket, why are you (still) here?"

Note that, in this case, we had to make some difficult trade-offs of cost versus representativeness. Short of a full national representative sample of teens (out of our budget), almost any method was going to have a skewed sample, reducing the generalizability of the results of this phase. Thus, the aggregate frequencies are not directly representative of the broader population of Cape Town or South Africa more generally. Instead, the results of the questionnaire should be interpreted as explorations, and in the spirit of hypothesis testing, pattern location, and comparison within groups. In particular, we will focus first on the observed differences between teenage respondents and adults. Where appropriate, we drill down further, contrasting the responses of teens found in cybercafés from those in libraries.

We used leave-behind or self-administered questionnaires, with a ZAR10 (US\$1.50) airtime incentive for completing the 15-minute questionnaire. The questionnaire was made available in English-only, Afrikaans and English, and isiXhosa and English versions.

In June and July 2011, we distributed questionnaires at seven PAVs. We received responses from 294 users, including 171 users at four libraries and 141 users at three cybercafés (missing value on venue=3). Of the respondents, 67% were male, while 33% were female. The average age of respondents was 23, ranging from 12 to

55. In a sample including teenagers, measuring the subjects' highest completed education can be misleading, but in general, the highest completed education among adults range from high school and "matric" (passed final high school exams), up through some university training.

In terms of other demographics, the questionnaire captured a diverse set of Cape Town residents, not strictly the poorest of the urban poor. Of the respondents, 56% spoke isiXhosa as a first language, followed by English (27%), Afrikaans (24%), and Zulu (1%). English was listed as a second language by 52% of respondents. The share of respondents who said they were unemployed was 62%, while 17% were employed, 10% worked part-time, and 8% were self-employed. Most said they had electricity in the home (92%). The most common type of dwelling was a freestanding house (70%), while 14% of respondents said they lived in informal housing. The most common travel distance to get to the venue was 5–20 minutes, with 81% of respondents saying they could get to their venue in 20 minutes or less.

7. DISCUSSIONS AND FINDINGS

In lieu of an exhaustive item-by-item summary of the data gathered in the three rounds (which would be too lengthy and disjointed for this report), we instead will transition into the results and discussion sections with the stories of four young people: Sbu, Sandisiwe, Jayden, and Ayanda⁴. Their narratives are presented to illustrate and represent a range of individual trajectories and practices in the use of PAVs in Cape Town, and in particular, to suggest the different extents to which online, digital, and mobile resources are available to and recruited by this group.

Sbu: I have everything in the tip of my fingers.

Sbu (19, m, African Axess, Internet Cafe) was an exceptional example of someone who used mobile technologies to both make the most of his opportunities and overcome difficult family circumstances by pursuing his interests and developing strategies to access training for his chosen career. Online participation allowed him to develop interests first established at school, to maintain a relationship with a sponsor whom he'd never met, and to find opportunities for further study. He had grown up in a foster home in Boksburg, a lower middle-class suburb in Johannesburg, where he was raised with six siblings by a foster mother. He had attended state schools in Boksburg, where he developed an interest in art, drawing, and animation. His primary school had introduced him to computers, and a librarian at the public library had taught him to use Gmail. Unlike most of the other participants we interviewed, online interactions and digital technologies had been an everyday part of Sbu's environment ever since he could remember:

[Laughs] It happens, I don't know. You grow up and you just see everyone doing it [using technology] and then you do it too. (Sbu, 19, m, 3 May 2011, African Axess Internet Café)

At the time of the interview, Sbu's living expenses and educational fees were sponsored by Unilever, a local company with whom he only ever communicated online. He relied heavily on mobile Internet, and because his interest in art and animation involved heavy bandwidth use, he was making the most of the somewhat unreliable network but very cheap data rates on 8ta, South Africa's newest mobile network. He used his Motorola Razr2 V8 smartphone as a modem.

Sbu greatly disliked the lack of privacy and security risks associated with using a PAV, but he relied on it when the 8ta network was unavailable. He particularly liked the availability of such devices as scanners and faxes in the venue. He thus used the Internet café for certain tasks which he could not perform using only his laptop and phone, or for which he needed faster Internet or Google Maps. Online interaction was central to maintaining his friendships with friends he had left behind in Johannesburg, and it also played a key role in extending his interest-based participation in online fan communities centered around drawing, digital animation, and art. He used MXit to stay in touch cheaply with his six closest friends, and he had a wider interest-based circle on Facebook and Twitter, focused on shared interest in animation:

Okay, um, as I'm here in Cape Town, my heart is in Joburg. Everything else is in Joburg. So I speak to my friends in Joburg via MXit, Facebook and Twitter. I um, I able to contact guys in Japan and everything. Okay, I have a few, I have five friends Facebook who are from Japan. (Sbu, 19, m, 3 May 2011, African Axess Internet Café)

⁴ Names changed to preserve anonymity.

On the day of the interview, Sbu was investigating copyright at the Internet café, and he had used his phone to research animation courses in London and Cape Town. He had successfully scanned and emailed his art portfolio and his application to an animation program in London and had been accepted. Unfortunately, the available funding from his sponsor had not stretched to cover international fees. At that stage, social workers had advised him to move to Cape Town and register to study animation at a college in Woodstock in Cape Town. While waiting to register for his animation course, Sbu occupied himself with a project called “Edu-Rhythm,” which involved collaborating with three others to rewrite school textbooks in musical form to be recorded and released on CD.

Sandisiwe: The week goes by without airtime.

In contrast to Sbu’s urban, middle-class background, Sandisiwe (19, f, African Axess Internet Cafe) had spent most of her childhood in the rural Eastern Cape, and had only moved to Cape Town at the age of 15. Also unlike Sbu, she was a newcomer to the world of computers and was largely excluded from the world of online interaction, apart from social uses of MXit, which she had installed on her phone and used since the age of 16. She fell into the category of low airtime users in our sample, and she struggled to estimate how much airtime she loaded on her phone per week:

Yho! The week goes by without airtime. (Sandisiwe, 19, f, 3 May 2011, African Axess Internet Café)

Sandisiwe had never learned to use computers while at school. At the local high school she had attended in Langa, computers had been reserved for the use of the teachers. Having just completed school, she had just registered for an introductory course entitled “Introduction to MS Office” run by the same Internet café used by Sbu. She hoped to learn enough there to become a receptionist. On the day we interviewed her, she had come to the Internet café to complete a typing lesson and check her newly acquired email account on Yahoo!. She talked about having overcome a fear of computers, specifically a fear of damaging the machine by touching it and infecting it with a (biological) virus.

Sandisiwe enjoyed free use of the venue’s facilities for the duration of the course. Though she had recently learned to use Facebook on her Samsung E250 phone, she could now explore the web free from the considerable constraints of expensive mobile airtime. She was enthusiastic about using the free bandwidth at the Internet café to reconnect with people she knew from the Eastern Cape, but she now had two distinct Facebook accounts—one for her phone and one for her computer, each with a separate list of friends.

She shared a MXit account with her brother, and together they had collected a small group of 10 MXit contacts. She associated MXit with “rude” chatrooms, “nude pictures,” “gangster names,” and swearing, rather than serious applications or the maintenance of existing friendships. MXit did not allow users to search for contacts, and so she had not been able to use the application as she used Facebook to reconnect with friends from rural areas.

Sandisiwe’s story shows the importance of PAVs in supplementing a school system which fails the majority of young people. Such venues also remove some of the constraints on mobile participation imposed by limited finances. As a determined but late adopter of computers, Sandisiwe’s story also revealed the difficulties mobile-centric Internet users experience when learning PC skills.

Jayden: As dit nou na jou phone toe kan stuur [If it could just be sent to your phone].

Jayden (17, m, Delft Public Library) was a singer who belonged to an a cappella group who used their cell phones to record beats and mixes, and a friend’s computer in Belhar to record their voices. They performed at birthdays, school, and other community functions. They had recorded a CD of their tracks and used Bluetooth to share their recordings with friends. This group of friends used the local library in Delft to meet up and hang out, as well as for schoolwork. The constraints on accessing the web in this space and regulations prohibiting media use in the library meant that Jayden had not used the library to develop his passionate interest in Afrikaans music, games, or cars, or

to promote and share the music which he and his group had recorded. Although Jayden knew many Afrikaans musicians (the genre of music which interested him), he didn't know how to source Afrikaans music online.

Jayden spoke Afrikaans both at home and at school, and he attended a local school in Delft which had a computer lab but no library. He had a computer at home but no Internet. Two years earlier, at the age of 15, he had started using the Internet on his cell phone, a Samsung J700, mainly in order to download games. Now his group of peers socialized on MXit, and mobile games were their cultural capital, the key to attaining social status and popularity.

The group of friends were somewhat discontented with the library because there was nowhere where they could practice their music, and they had experienced some unpleasant conflict associated with the enforcement of the library's rules for quiet. His group's peer norms clashed with the adult-enforced rules for using the space.

Unlike Sandisiwe, Jayden was relatively comfortable with computers, but this comfort centered around copying and producing digital media; it did not extend to online interaction. Unlike Sbu, who used Facebook and email to connect with other artists and fans, Jayden and his group of would-be musicians did not use the Internet to connect to affinity groups, distribute their music, or engage in interest-driven participation via social media or user-generated content.

Ayanda: I can be myself and do what I want to do.

Ayanda (18, f, Langa Public Library) had completed her schooling, and at the time of the interview, she was still researching options for further study. Her mother was employed as a domestic worker, and she lived in Langa with her aunt and uncle. When at high school, she had travelled about 8km every day to the southern suburbs of Rondebosch in order to attend school. Although she was unemployed, she occasionally earned a small commission by recruiting clients for a "legal company." The library was useful as a place to conduct her research and print posters advertising the company's legal services to the community in Langa.

Ayanda was also an adept MXit user; she had earned several of her commissions by successfully advertising for clients in MXit's classified section, MXChange. She was particularly proud that she had also been able to help her aunt source sewing material on credit by using MXChange. Apart from her use of MXit for economic participation, she was heavily involved in social interactions on MXit, and if she could not log in for some reason, she knew that she would be missing out on the vibrant social interactions taking place among her friends and contacts: "There is a lot of action . . . it's happening."

Apart from printing her marketing materials in the library, Ayanda had also relied on the library to access Facebook and research school projects, or (now that she had left school) to explore options to study further. These activities required "opening a lot of pages" on the web or extensive use of graphic-heavy, bandwidth intensive pages, which was not really affordable on her mobile phone. From experience, she knew that looking at two pages for about four minutes would "eat" ZAR2 of her airtime, or a tenth of her weekly quota of ZAR20. While Facebook required a relatively large airtime investment, on MXit, she could IM freely even with airtime balances as low as 10c left on her phone.

Now that she was no longer studying, Ayanda particularly disliked the fact that she had to adopt a more sedate, silent persona ("not myself") in the enforced quiet of the library, especially when waiting quietly for 45 minutes to access a computer. So when she could afford to, she went to an Internet café and spent ZAR10, which allowed her to be herself: "[Y]ou pay and that gives you the right" (Ayanda, 18, f, 14 March 2011, Langa Public Library).

Summary

A great deal of research documents how informal online learning networks are leveraged effectively by young people in the global North. In similar ways, Sbu, who grew up in a foster home, utilized mobile Internet and public

access facilities to develop an extensive network of interest-based participation, eventually applying successfully to animation schools both in London and Cape Town. Sbu's story testifies to extraordinary individual resourcefulness, and it is also an example of how a more privileged middle class and elite in South Africa are able to use online resources. The contrast between Sbu, Sandisiwe, and Jayden illustrates the gap between young people with some financial resources and access to middle-class schooling, and the majority of their peers. Sbu was sponsored by Unilever, which took care of his daily living costs, lifting many of the financial constraints on participation which were serious obstacles for his peers. His access to middle-class schooling and command of the social networking practices associated with Facebook, email, and computers underpinned his exceptional successes with mobile technologies. The limited uses of expensive mobile access and the restrictions on participation in free PAVs were only some of the reasons that excluded most of the young people we interviewed from online participation. A recent migrant from a rural province, Sandisiwe used paid public access training and facilities to make up for her school's failure to introduce her to computers and the Internet at all. She struggled to integrate her existing mobile digital habitus with the new computer-centered practices she was encountering. Meanwhile, despite Jayden's extensive involvement in interest-based activities and digital media production, he found himself cut off from mobile or online participation, both as a fan and a musician, by the cost of mobile communication and the regulation of library spaces, which had also become a problem for Ayanda.

At the same time, Ayanda's shoestring successes are notable. She used the affordability of MXit to source social information from her social networks, and to recruit clients and earn commission. She also made the most of PAVs for more demanding and expensive activities, and to support her part-time, commission-based work.

We now contextualize the narratives and trajectories of these four very different young people in relation to the usage patterns observed among the larger group of their peers who were interviewed.

The experiences of Sbu, Sandisiwe, Jayden, and Ayanda are illustrative of the ongoing interplay we observed between the constraints and affordances offered by the ecology of communication options, the choices and strategies employed by young people in relation to overall habitus, available resources, roles, and preferred genres of participation in specific social fields. In this sense, we discuss our results in the spirit of discussion of a structural process whereby users, institutions, and technologies interact and co-evolve (Yates & Orlikowski, 1992). With the process lens, there are two salient caveats:

First, the observed uses we captured in 2011 are a "snapshot" of an ongoing process. Conditions are changing as more mobiles become more Internet-enabled, for more users; as smartphones and even tablets become more affordable; and as the costs of mobile and broadband Internet come down. The relative patterns of technology use may be more stable than the absolute levels of technology access we observed. We acknowledge that the general path seems to be toward lower-cost, more powerful, and "converged" devices, and that, over time, the current stark practical and conceptual splits between (public) PCs and (private) mobiles will begin to erode. Thus, we are reluctant to make specific forecasts of how the access/affordance/costs/skills interplays we observed in 2011 will look in 2021 or beyond, or to predict how long it might be before teens like Sbu, Jayden, Ayanda, or Sandisiwe will be able to accomplish their life goals without PAVs. Instead, we hew closer to the current snapshots than to the speculative trends, and suggest some immediate steps that policy makers and venue operators can take to help this generation of teens, rather than the next one.

The second salient point is that there is not a single form of "access," nor even a single institution providing "access." There is, rather, a communications ecosystem, allowing the formation of user repertoires (Dimmick et al., 2011; Haddon & Vincent, 2005; Licoppe, 2004; Nardi & O'Day, 1999). These repertoires are not freely picked from some kind of menu or assembled effortlessly like lego blocks, but rather, they reflect the overall influence in individual biographies of a primarily mobile habitus shaped strongly by friendship-driven interactions with peers via cell phone or Facebook IM; a print/computer habitus mostly associated with experiences of school and sometimes work; and a digital media habitus generated through cultural and fan activities, and relying on phones, Bluetooth, and (less frequently) computers and the Internet.

This section offers evidence and discussion organized around the five key claims first presented in the introduction section.

C1A: Public access and Private mobiles offer different affordances. Among low-income users, free use (such as that in a library) supports more resource-intensive goals (storage space, time, bandwidth) and stable media production, while paid use (such as via a phone) supports time-sensitive goals and transient shorter-form messaging.

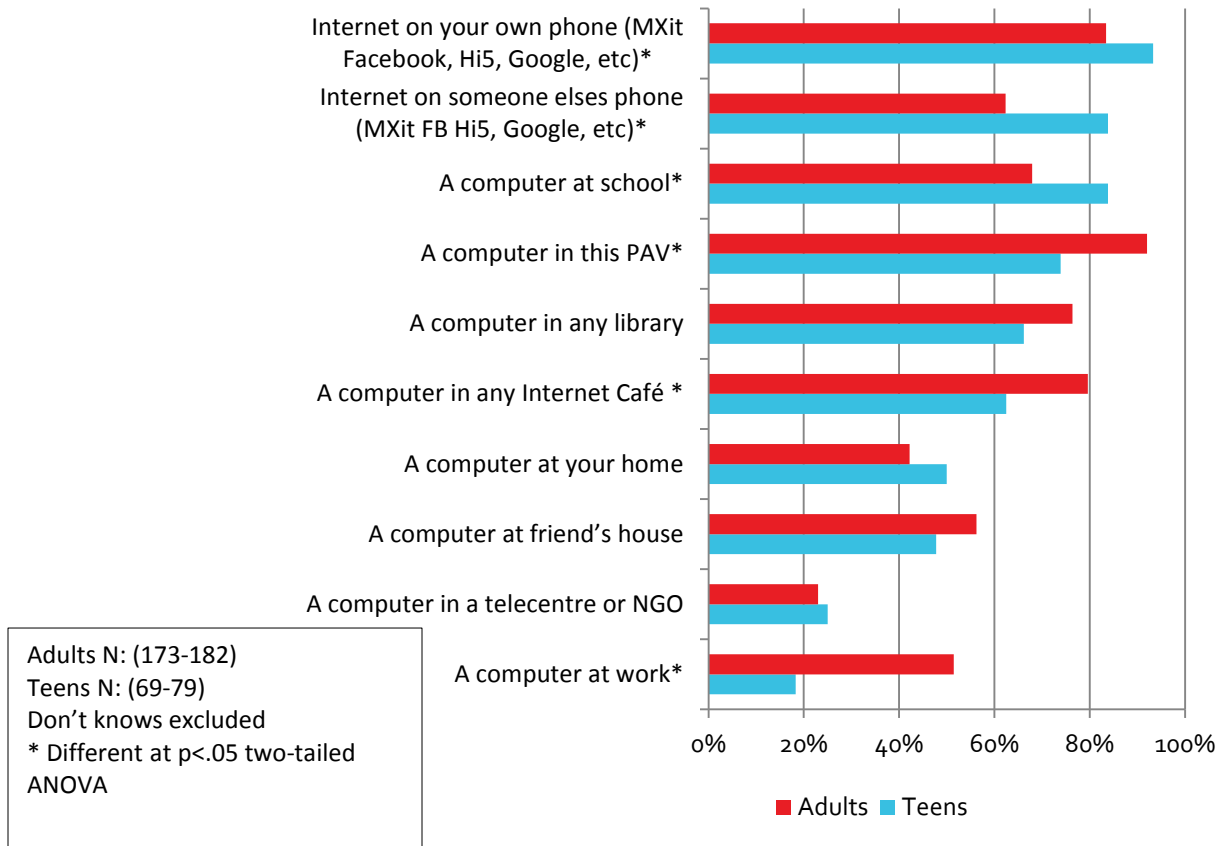


Figure 2: Access is multi-platform, multi-location.

In phase 3 (the user surveys in libraries and cybercafés), we asked the respondents where else, beyond the shared access venue, they had access. Figure 2 details how nearly half of all respondents reported accessing a computer from home. Perhaps more remarkable, 86% reported accessing the Internet via phone, including simple functions like apps, at least once. As expected, teens were more likely to report accessing the Internet via school PCs, and less likely to report accessing it via work PCs. More adults than teens reported visiting cybercafés.

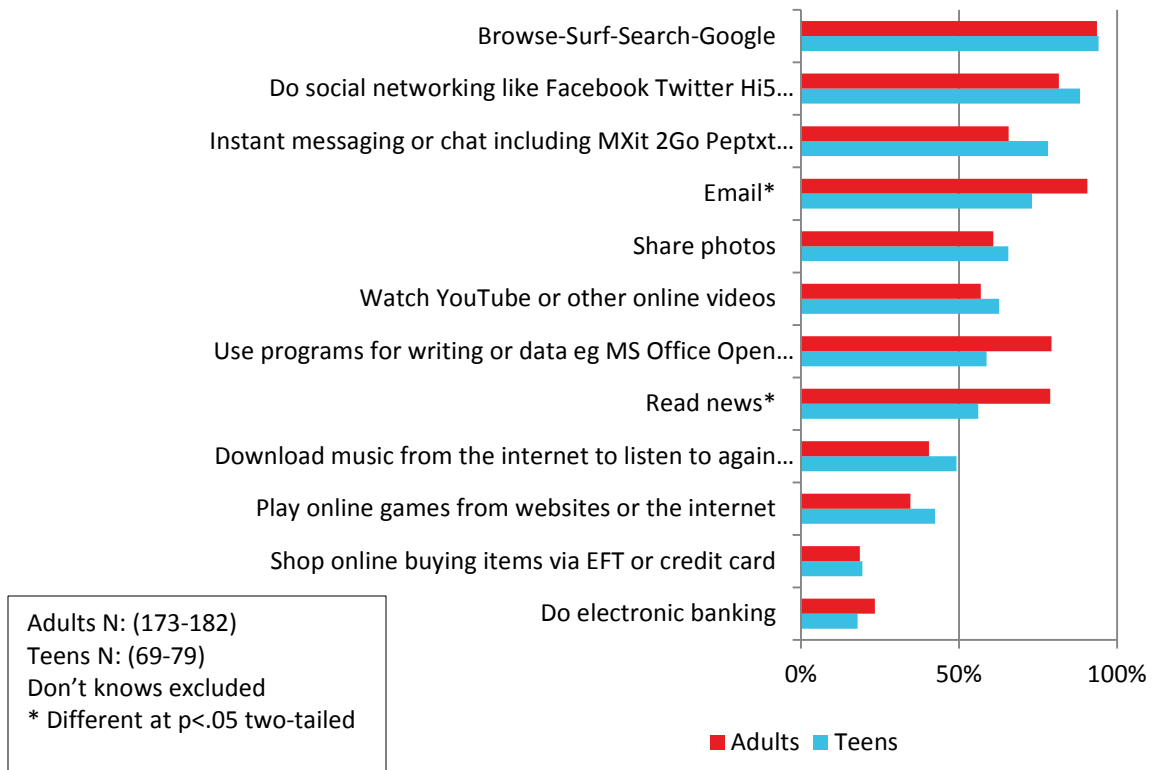


Figure 3: PAV users access the “The Internet” for many different reasons and tasks.

Beyond locale, an examination of the discrete uses of the Internet allows a more detailed glimpse of online practices. Using a list modified from the general Global Impact Study survey, we asked survey respondents in phase 3 what they had done online, previous to this one visit to the PAV. Figure 3 details how adults were significantly more likely to have used e-mail ($F(1,237) = 1.5, p < .05$, two-tailed⁵) read news online ($F(1,226) = 2.4, p < .05$), or used programs for writing or data processing ($F(1,226) = 1.9, p < .05$).

⁵ All p values are two-tailed tests unless otherwise specified.

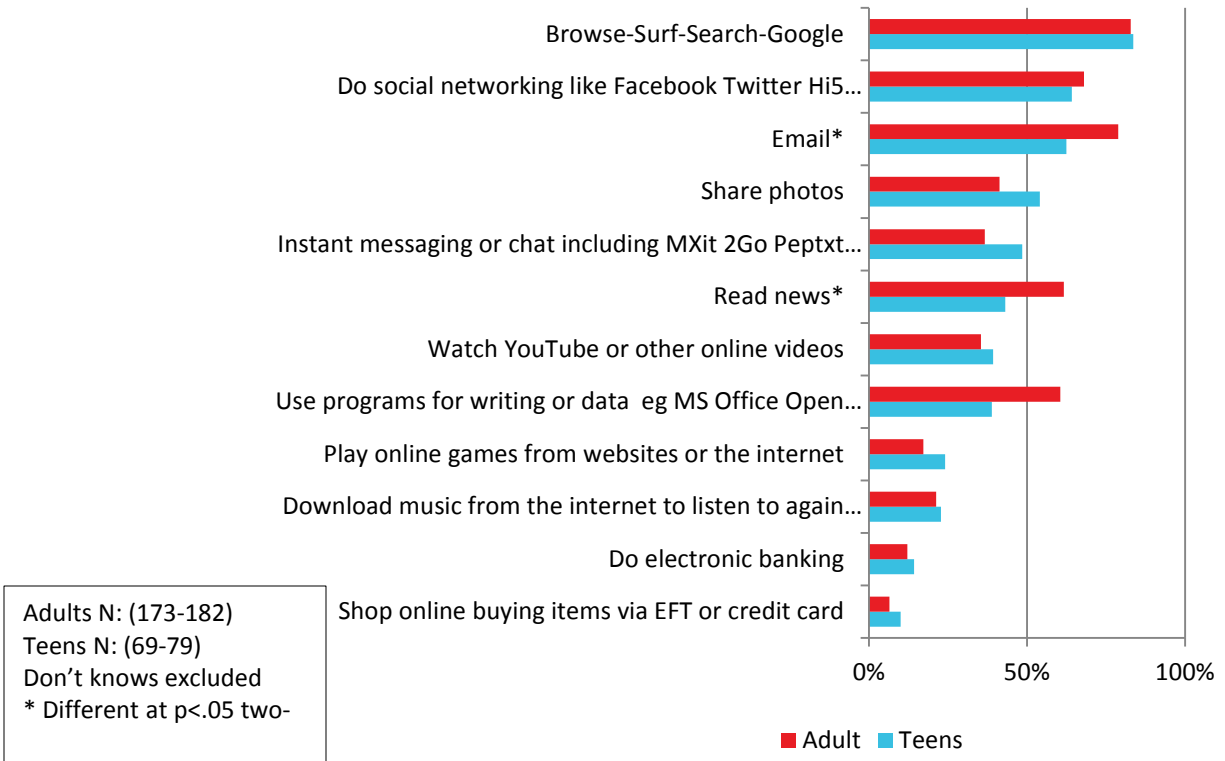


Figure 4 PAV users pursue different goals at the venue.

Figure 4 illustrates how browsing/searching/surfing was the number one activity, with over 80% of both teens and adults planning to do so on that particular visit to the venue. Adults were more likely to plan to use e-mail, read news, and do data processing or word processing. Teens were more likely to report social activities, such as instant messaging and chat, and sharing photos. About 40% of teens and adults planned to seek help while at the PAV that day. The difference between them was statistically non-significant.

In our phase 3 user survey, 90% of teens and 95% of adults reported owning a cell phone. These numbers are not significantly different. More interesting is that, while 82% of adults reported bringing their phone to the PAV, only 56% of teens did so. The difference, statistically significant ($\chi^2 p < .001$) is probably due to a combination of school regulations which prohibit the possession of cell phones during the day, and the very real concern about safety and theft. Figure 5 details how 89% of teens with access to a cell phone, and 82% of adults with access to a cell phone, said that the phone they use most often supports data and allows Internet access (“like for websites, WAP, or MXit”). Thus, there is a remarkably high degree of penetration of mobile Internet into the population of respondents. Again, we can't extrapolate up to the age brackets in Cape Town in general, but for the sake of the rest of this section, we will be describing users who indeed have a trade-off that they can make, between the PAV and data access on either their own phone or the phone of a friend or family member.

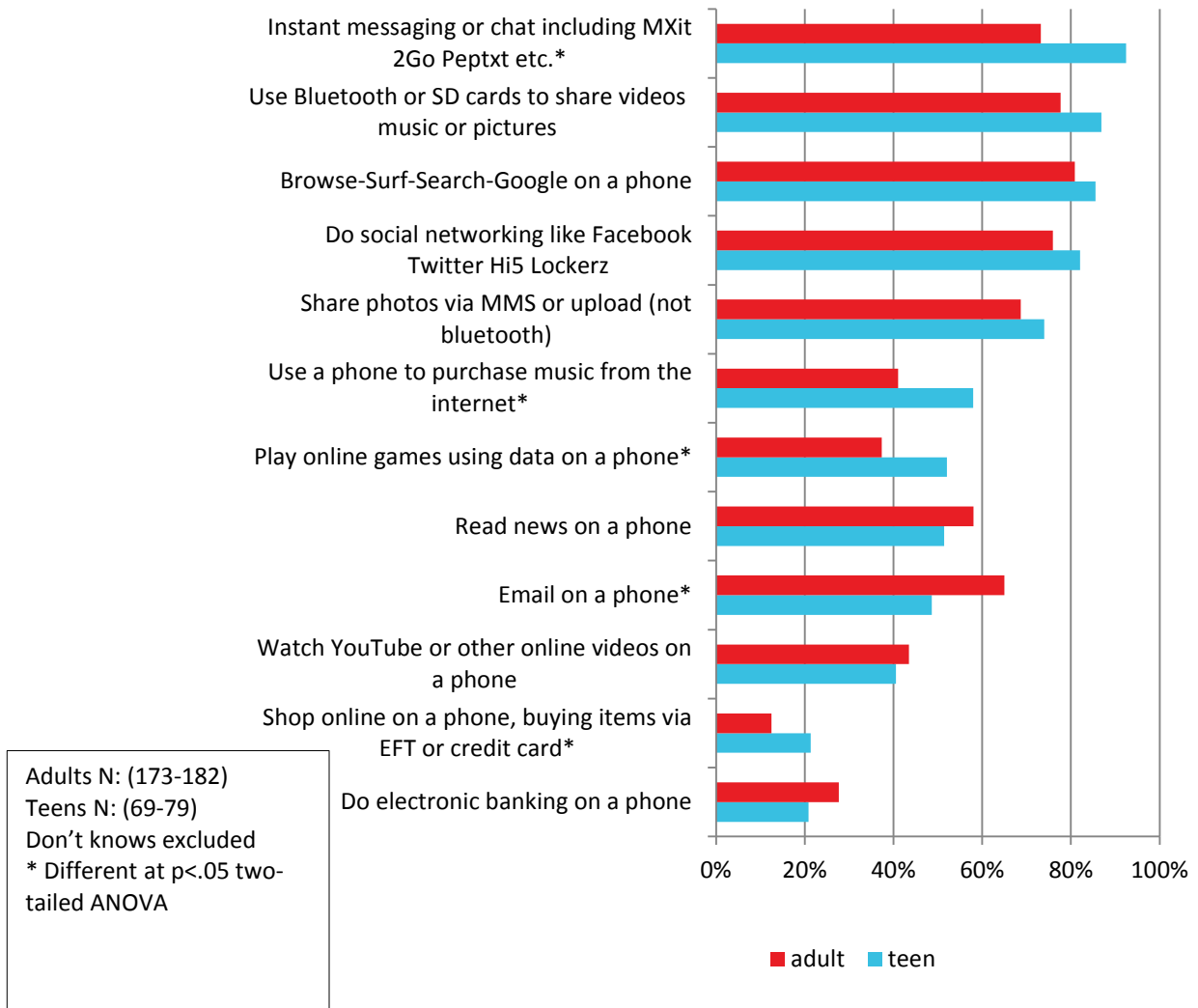


Figure 5: PAV phone owners use advanced phone features.

Phone-based email was more common among older users, and games among younger users, but for the most part, this relatively savvy set of respondents reported similar patterns of mobile Internet use. The mobile Internet is used for search, instant messaging, and social networking. In addition, there is lots of file sharing, in terms of photos and side-loading. There is less video watching, and fewer respondents report engaging in commerce (banking, shopping) via the handset.

It is important to stress that having an Internet-enabled handset does not mean that any individual user will use that feature, nor that he or she will use it effectively. For example, we asked respondents if they had purchased a data bundle recently. For prepaid users, data bundles are a way to designate an investment in bits, rather than minutes. By buying in blocks as small as 100mb, users can secure significantly lower per-bit rates. Unfortunately, only 37% of teens and 32% of adults surveyed said they had purchased a data bundle. Perhaps many of the rest are paying more for a bit than they should be. Some may be confused by the complexities of maintaining both a data balance and an airtime balance (Donovan & Donner, 2010), but many may simply not want to allocate a relatively large portion of their limited airtime resources exclusively to data.

C1B: Teenage users have developed complex, fine-grained practices which help them to negotiate the respective strengths and weaknesses of public access and private mobiles—including practices that help to minimize costs and maximize convenience—and also a keen sense of which affordances or use-settings will be more productive to reach given goals.

Our first claim is split into part A, concerning broad behaviors, and part B, concerning fine-grained practices. They are related, but for part B, we switch from the broad phase 3 survey data to the details available in the in-depth (phase 2) interviews with teens.

In the in-depth phase 2 interviews, teens reported that computers were largely shared devices. Only 30% of participants had individual ownership of a computer (lower than the average in our phase 3 survey), with the majority relying on various forms of shared access, which they experienced more often as convenient (77%) than inconvenient (25%). Even so, only 58% reported that they could use their own or a relatively convenient shared computer to access the Internet. In other words, the PCs available to participants were not always reliably online.

Access to school libraries increased from primary school (45.3% had a library) to secondary school (66%), possibly because parents or family members moved children to regions or schools with better facilities. Levels of access to computer labs were somewhat higher than of access to school libraries in both primary (66.0%) and secondary school (79.2%). Libraries were often not actively used, with many participants reporting a gap between access and use.

Amongst the teens in phase 2, 75.5% had individual ownership of a phone. As a result of phone sharing, 92% were able to access the Internet using someone's phone. The most popular handset manufacturers were Nokia, particularly the Xpress Music feature phone (13.2%) and Samsung, particularly the ubiquitous E250 feature phone (11.3%).

On average, the young people interviewed reported spending ZAR21.90 on airtime per week (n=32). Just under a fifth reported that they spent less than ZAR10 on airtime per week. In comparison to their peers, they can be considered low airtime users.

As individuals, they had spent an average of 4.5 years using cell phones (n=30), 2.4 years using the mobile Internet (n=31), and 5.5 years using computers (n=33). They had been using the public library for 5.3 years (n=33). Those who were asked to estimate had connected with an average of 85.6 contacts on MXit (n=14) and 303.8 friends on Facebook (n=10).

The Emergence of a Dual-Habitus: Interplay of Applications, Platforms, and Venues

A small number of key software applications were used by most of the teens in phase 2. Google search was used almost universally (98%), as were a range of word processors (mostly MS Word, Open Office, or WordPad; 92%). Local mobile instant messaging and chat application MXit remained popular (88%). The more recently adopted social network site Facebook was also strongly established in this group (69%). Figure 5 illustrates an interesting and important split in teens' respective digital habitus. Of these big-four apps, teachers were responsible for teaching word processing and search, while peers were the primary mode of diffusion and adoption for chat and social networking.

Word processors and MXit or mobile instant messaging were strongly typed by platform. Participants were asked about which platform they usually chose when using the software applications they used most regularly. No one

primarily used word processors on their phones. Similarly, no one preferred to use MXit on a computer. Only one person had used the available MS Word mobile application, and one other person had downloaded the desktop version of MXit and installed it on his computer.

Learning to use software applications (n=53)

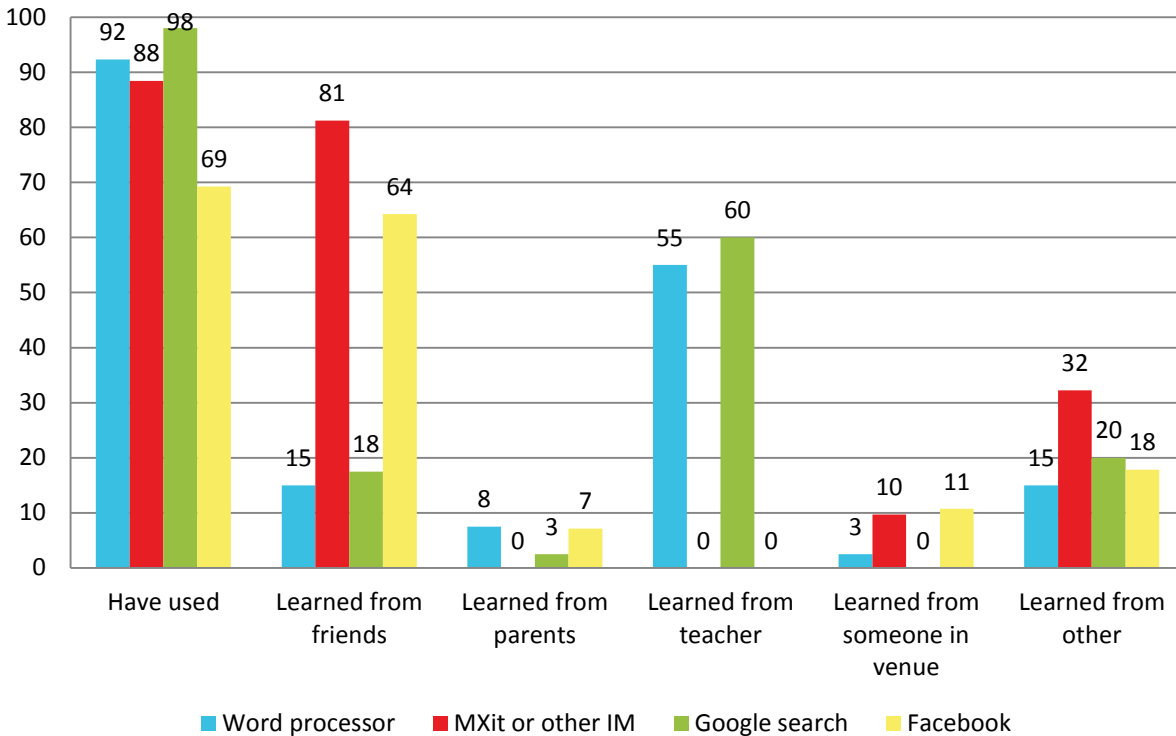


Figure 6: Learning apps: Networking from friends, production from teachers.

More strongly hybrid or cross-platform practices characterized the use of Google search and Facebook, and young people expressed preferences for all three modes of using the application. Computers were the preferred platform for Google searching, with users able to transfer their skills to mobile in a pinch. Cross-platform use seemed to be the preferred way of using Facebook, with participants electing to use the accessibility and privacy of mobile phones together with the convenience and economy of computers. This combination allowed them a less expensive mode of access, better ergonomics, and an expanded set of features, particularly instant messaging, which is not available in the mobile application.

To summarize, then, MXit and other forms of mobile instant messaging (2Go, Peptxt) were almost exclusively used on phones and were only learned in the context of peer networks, primarily to support friendship-based interactions. Facebook and Google search, though, were best adapted for cross-platform use on both phones and on computers.

“Ugoogla yonke into” [You Google everything]. Sixteen young people commented on the convenience of search. They mentioned a wide range of circumstances affecting ease of use, including Google’s comprehensiveness, less dependence on others for information, the availability of “summarized” information online, the accessibility and granularity of mobile searching, and the convenience of free public access which didn’t require airtime. The search engine was not only used to obtain information, but also as a general way of developing understanding of academic language, and English in particular.

Only one participant (Z, 16, f, 7 April 2011, Langa Public Library) noticed any shortcomings or gaps in the provenance or academic quality of online information and pointed out the gaps associated with online information about South African history and local cultures.

On the one hand, quick-turnaround “match and grab” search-copy-paste-print routines had adapted to the pressurized library environment, where some libraries allowed each user only 15 minutes of computer time. In other cases, the luxury of longer periods at the computer (as at the Internet cafés) or the discipline of regular visits to the library, well before project deadlines, allowed more sustained involvement in processes of editing online information; the development of visual designs, both in and outside the word processor; and integration with handwritten and photocopied material.

Perceived Strengths and Weaknesses of the Mobile Internet

The majority of the interviewees (55%) reported that they used the Internet mostly on either just their phone or both phone and computer, and can thus be considered “mobile-centric” Internet users (Donner et al., 2011). Non-parametric statistical tests suggest that this group of mobile-centric users were more recent computer adopters than their peers, who, overall, had been using computers for longer (independent samples Kruskal-Wallis test, $p < 0.5$).

Teens rated mobile phones as highly convenient for certain kinds of information access. At times when access to cash and airtime was intermittent, the public library was more convenient than mobile access, as one teenager at the Langa public library explained, “Sometimes I don’t have money to go to the Internet cafe and don’t have money to use my sister’s phone, so I do come here” (L, 16, f, 4 April 2011, Langa Public Library).

Mobile Internet was well established in the informational ecosystem, but both project network diagrams in phase 2 interviews and the phase 3 survey indicated that it was not often utilized for schoolwork. Interviews suggested that, as a highly commoditized form of access to information, the utility of mobile Internet was limited. Thirteen participants in phase 2 commented on the cost of airtime as a limiting factor. Phase 3 surveys suggest that this may be intensified by, or at least related to, the limited use of data bundles.

Thus, the costs of mobile access made it a convenient but unreliable resource. For example, Ayanda explained that she alternated between computer and mobile Internet, depending on whether she had airtime: “I use a computer when I do not have airtime and I use cell phone when I have airtime.” She also commented on her awareness of the cost of waiting for pages to download: “You wait for the next page to reload and that costs a lot of money” (Ayanda, 18, f, 14 March 2011, Langa Public Library).

Phones were also considered a way of accessing the more expensive mobile web “*ka ncinci*,” or just a tiny bit, without incurring the hourly expenditure required to use an Internet café.

Pages, often designed for computers and cheaper and faster broadband users, downloaded painfully slowly on her phone. Some networks billed for data by time, rather than by megabyte, and our observations of mobile Internet use showed that young people avoided certain actions, as they used the mobile web in order to avoid costly downloads. “I can also change the size on here but it will take my airtime” (M, 18, m, 19 May 2011, Langa Public Library).

Apart from cost, the inability to multitask on, print from, download, or display large images with a mobile phone were seen as disadvantages, and writing down information from a mobile phone screen was viewed as a highly inconvenient way of transferring information.

The Friendship-Driven Habitus: MXit and Peer Networking

The ubiquitous MXit was primarily associated with instant messaging, rather than information access, as it allowed a cheap, immersive form of communication with peers. Overall, the freedom from financial considerations and commodified forms of mobile communication on MXit added considerably to the user experience. These factors also help to explain its enduring appeal to this group despite the availability of alternatives with better multimedia and networking functionality, such as Facebook:

[MXit] has actually been fun. Because it saved a lot of money. ... Because one SMS costs like 1 Rand. Whereas on MXit if you have 1 Rand you feel like a billionaire, because you can talk for the whole week on one Rand. (L, 16, f, 4 April 2011, Langa Public Library)

Although intermittently having cash for airtime limited uptake of mobile Internet, those like N (15, f, African Axess Internet Café) who had slightly more resources, took great delight in the convenience and luxury of “perpetual contact” created through mobile contact with their peers via Facebook, while MXit allowed for a slightly different and far more economical, less interrupted mode of interaction:

I can chat with my friends all the time! Yo! I enjoy that! Go on Facebook. Update my status. Write how I feel. What has been happening in my life. People commenting. If I don't have airtime, I have like one Rand, I go on MXit, chat with my friend the whole night. It has made a big difference. (15, f, 19 May 2011, African Axess Internet Café)

This freedom and abundance of communication allows for a playfulness and even excess of interaction via MXit. Since communication costs little, interactions can proliferate, shifting freely into games of attention and popularity. MXit's use of minute quantities of airtime meant that MXit use also shifted out of the domain of parental surveillance and regulation, increasing its role in youth culture as a space for self-expression largely invisible to parents.

MXit and mobile chatroom 2Go were also used to extend social networks through online relationships or “meeting new people” (15, f, 19 May 2011, African Axess Internet Café). As in the case of Jamaican practices of “link-up” (Horst & Miller, 2005), MXit provided an affordable way to maintain existing connections that might attenuate without regular face to face contact: “[MXit is] very cheap and you can talk to friends all across the province...that I haven't seen in ages, then I ask, instead of phoning them, I'd MXit them” (L, 18, f, 9 May 2011, Delft Public Library). Some interviewees were adamant that their use of MXit, games, or other mobile applications was entirely for pleasure, bearing absolutely no relation to schoolwork or other instrumental uses.

C2: The PAV provides non-substitutable impact to resource-constrained users, even those with “the Internet in their pocket.”

Unlike the other research projects in the Global Impact Study, the primary goal of this module was *not* to assess the impact of investments in public access on individual lives. It was, rather, to assess how the introduction of mobile Internet might change the nature of those possible impacts. The core behavior in question in our detailed study (mobile Internet use) is not enabled by a traditional “ICT4D” intervention or project. Almost all teenagers that we spoke to, by definition, has “access” to the Internet and a microprocessor—and this access is *in their pockets*, or at least on a close relative’s handset. Thus, our contribution to the question of the impact of public access is more about re-conceptualizing what a PAV’s impact might be in a “post-access” world, than for actually assessing the impact of any funds spent on providing access.

Thus, one approach in the analysis is to identify and isolate what users consider to be the non-substitutable services or affordances offered by the PAVs. Clearly, elements like social networking, micro-coordination (Ling & Yttri, 2002), media sharing (SD cards, photo sharing, and music playback) (Walton et al., 2012), and chat are supported by phones and through teens’ friendship-based digital habitus. What remains for the PAVs?

We agree with the framing offered by Bar and Best (2008), that it is more fruitful to assess public access as different than private access (whether mobile or fixed), rather than as a substitute for private access. Indeed, the results below are framed as the ways in which public access offers, at this moment, to this population, non-substitutable and critical value to teen users. The mobile Internet is making great strides, but it is not yet a substitute for the public access scenario in total, considering hardware, network, cost, space, and guidance.

Job Search and Free Access: Impact, Self-Stated by Venue Operators

We asked PAV owners point-blank: “In your community, has it made a big difference to have public access to the Internet in your venue?” The reply was resounding, as 33 of 36 answered yes. So we had to drill deeper. The most common theme, with six mentions at the pay venues and nine mentions among free venues, was the way the PAV helped people with employability and their job search. Other responses, less common, included increased confidence (three and eight mentions), and the provision of a safe space (three and four mentions). The open-ended codes for why the Internet had made a difference skewed by venue type. The biggest difference was in the issue of cost: Of the free venues, 10 of 25 mentioned their primary impact in terms of the subsidy of free access.

For example, contrast these two responses from cybercafés with the three from libraries:

We have very good parking facilities and are located in a mall, so people feel very safe to come here, or to drop their children off here. (Manager, 2 March 2011, Cybercafé)

Skype has made a very big difference—we’re one of the only Internet cafés around here that has it, and because of all the foreigners we do such good business. It is so cheap now to call far with the Skype, and people can keep in touch and hear each other’s voices, without spending all of their money. They love it. (Manager, 3 March 2011, Cybercafé)

It’s free of charge. And it’s a central safe place. Sometimes if we’re offline, people will go look for other libraries. It’s helped so much for development. People can keep an eye on tenders, or look for jobs online, create CVs—at no cost. We have enriched the community to an astounding degree. (Senior Librarian, 2 March 2011, Public library)

For school children it helps to get the most recent information we cannot provide with books. That makes their life more easy. And also from our side, information is not on books yet. So we go onto the internet. Also staff goes onto the internet. Every morning staff checks newspapers in the morning—and print for the public—they can make copies. Was idea of library. Did that already before SmartCape. If they don't have library cards, they can do that as well. And if people don't get time on the computers, because the computers are occupied. (Senior Librarian, 28 February 2011, Public library)

Enormous impact. A free facility like ours, free internet, free certificated classes. The level of literacy in our community is relatively high compared to other low-income areas. Over 400 students have been trained over the last six years. Some people have found work, that have been through the classes. Office jobs, where they can use the computer skills. They can say to employers that they can work with Microsoft word—even with certificate. (Senior Librarian, 8 March 2011, Public library)

PAV operators were asked if there were other options for getting Internet in their communities. Generally, the libraries mentioned the cybercafés, and vice-versa. In urban areas, these options are expected. Only one library in Khayelitsha claimed to be the only, exclusive option for Internet access in the area. But the differentiator is price. Consider these responses:

The library is around the corner, where people have free internet for 45 minutes. We often get the people who do not have patience to wait at the library. Even though they have to pay, the rates are good (R10/30 min) and they would rather pay than have to wait for hours in a queue. (Manager, 2 March 2011, Cybercafe) Most people are not working. So they cannot afford to pay for Internet access. There is one Internet café in Lwandle. But it is for most of the people to expensive. So when the Internet is down in the Public library, the people have to travel to other public libraries. (Senior Librarian, 18 February 2011, Public library)

Free is your operative word. (Senior Librarian, 24 January 2011, Public library)

In summary, these framings of impact are reminiscent of those in other markets. Cybercafés, on the whole, framed their impact as transactional, based on convenience and access. Libraries stressed transformational elements of confidence and training, but also stressed the subsidy (addressing a market failure in community).

Teens Describe PAV Impact: “All the work at school requires you to get information here at the library.”⁶

As in phase 3, we asked teens in phase 2 why they were in the PAV that day.⁷ The majority (69%) of this group had come to the venue for reasons which they presented as primarily serious, such as working on a school project (33%) or studying (6%). Of those who were not working on their own schoolwork, two (5%) had come to assist a younger brother or sister with schoolwork, and another three had come for other reasons (sending faxes for a parent's business, attending a training course, or creating publicity posters for a concert to raise funds for a nonprofit). Many had come to the venue with more than one purpose: one related to schoolwork and another related to socializing, either online via Facebook or email (17.9%), or at the venue (5.1%). Some were pursuing an interest or hobby, such as playing games, finding information about the lifestyles of soccer players, or reading about celebrities.

All Phase 2 participants were asked to tell the stories of how they had used PAVs and mobile Internet, and to explain what kind of difference these resources had made to them. The narratives were coded and analyzed qualitatively with NVivo9.

Several participants attributed success at school to the accessibility of a PAV. As the Phase 3 survey confirmed, the most important use of the venue was for browsing/searching and surfing, and similarly, the most important impact mentioned in the participant narratives (16/53) was the use of search, and of Google in particular.

There is a severe mismatch between the South African school curriculum, which requires project-based learning, and the limited availability of learning resources in state schools, such as computers, books, and libraries. As a result, both schools and young people rely on public libraries. As A explained, he would be “prevented from learning” if he did not have access to the public library: “All the work at school requires you to get information here at the library”(A, 19, m, 19 April 2011, Delft Public Library). PAVs also supplemented resources available in the young people’s homes, which often did not have computers, printers, or Internet, or provide conducive spaces where they could concentrate on completing their homework.

Several participants claimed that their efforts in the libraries and Internet cafés had helped them to achieve higher marks at school. For example, M attributed success in passing the year to web searches: “Uhm . . . one can say [Google] helped me pass!” (M, 17, m, 9 May 2011, Delft Public Library).

⁶ Several participants responded to queries about the impact of public libraries, MXit, Facebook, MS Word, and Google by looking somewhat confused and worried that they might be disappointing the interviewer. Nine of the young people (17%) stated in no uncertain terms that there had been no impact on their lives. These comments can be read to suggest the gap between the institutional domains of school, medicine, and commerce our questions were exploring and the spaces for youth culture and informal social networking practices. Local ideologies of schooling and literacy meant that, while the impact of libraries and Internet cafés were almost always conceptualized in positive terms, the compelling forms of engagement young people developed when using mobile resources and MXit in particular were likely to be framed negatively, as an “addictive” force which competed for attention with schoolwork (T, 19, m, 6 June 2011, Cape Town Central Library), as a source of “limited” (B, 16, f, 17 May 2011, Langa Public Library) or less “valuable” information (T, 19, m, 6 June 2011, Cape Town Central Library). Extreme examples of this ideology saw the application as pathogenic or physically harmful to a phone: “I don’t want MXit. They say it even ruins the phone” (N, 16, f, 26 May 2011, African Access Internet Café).

⁷ About a quarter of the participants (14) could not be interviewed on the day they were recruited, and so their purpose in being at the library or Internet café was to attend the interview. The following percentage breakdown refers to the purposes of those interviewees attending the venue for non-interview purposes (n=39).

The interviewees had a number of theories about what had helped to increase their grades, including whether the venue had helped them to find the correct information, whether they had edited the information to show that they understood it, whether they had improved its visual presentation and neatness, or whether they had completed the work on time (or at all). They mentioned both the convenience of digital writing and the dividends paid when a “neat” and “professional” appearance for their projects translated into higher grades (marks).

The quiet atmosphere in libraries was seen as particularly conducive to studies, and several students worked in the library as a way of managing other demands on their time from family and peers. For those without any access to digital resources at home, two or three believed that, without access to the library, they would be failing at school.

The better facilities, convenience of access, and luxury of time in the Internet café were seen as giving additional advantages which were important for success in school projects.

Evaluation of PAVs in User Surveys

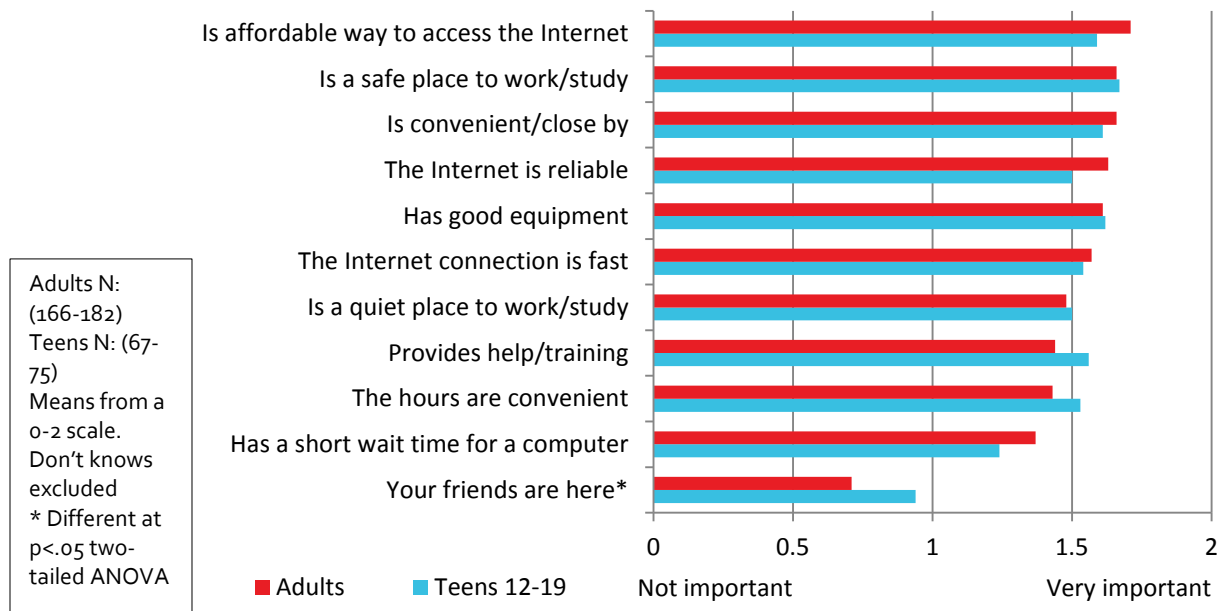


Figure 7: Importance of venue attributes.

There were almost no significant differences between how teens and adults described the important attributes of the PAV.⁸ Instead, in terms of self-stated importance, both stressed affordability, proximity, safety, the quality of equipment, and the reliability of the connection.

⁸ Teens were somewhat more likely to stress that the venue was a place where their friends were, but this was still the lowest-ranked item for both teens and adults.

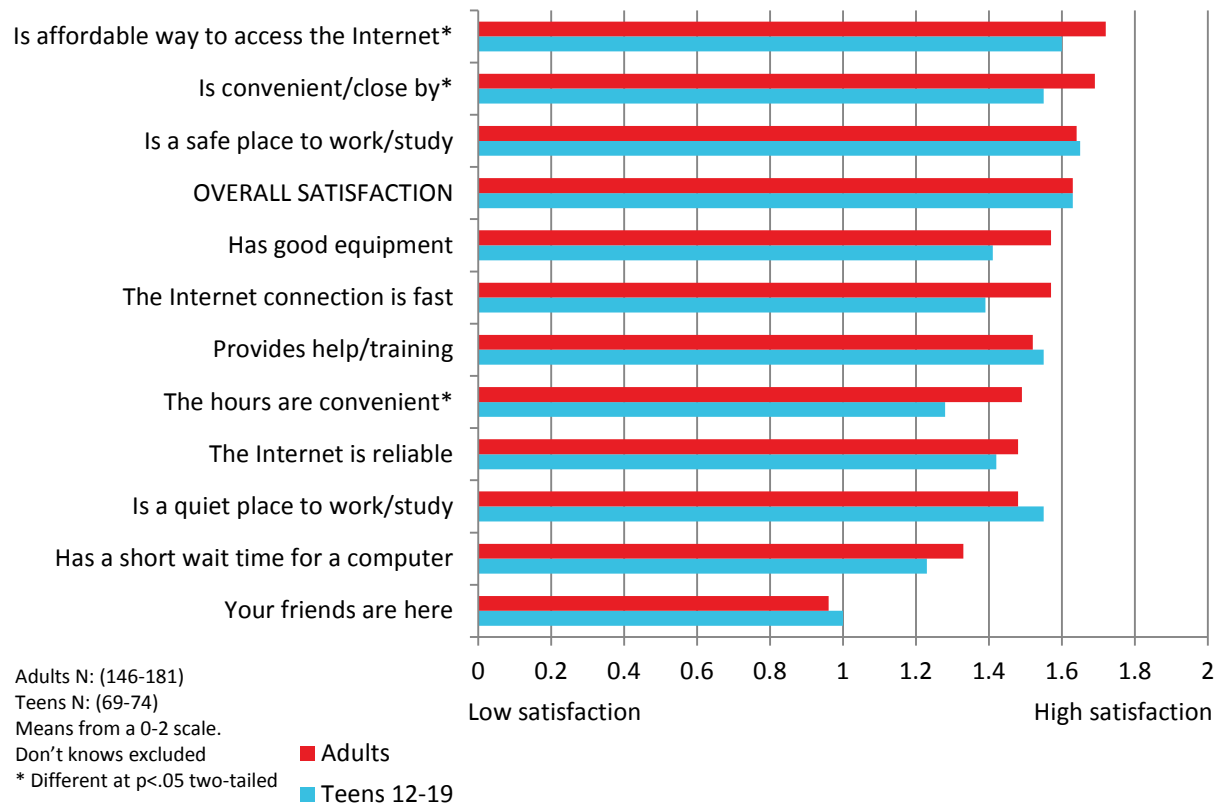


Figure 8: Satisfaction with venue attributes

Satisfaction scores mostly track importance scores for the venues. Respondents were most satisfied with the affordability, safety, and proximity of the venues. Teenagers were slightly less satisfied with affordability ($F(1,250) = 1.6, p < .05$), proximity ($F(1,252) = 1.1, p < .1$), and the hours of operation ($F(1,252) = 2.3, p < .05$) of the PAVs.

Forcing the Choice, For Argument’s Sake

We asked phase 3 respondents if they would prefer to do a series of tasks on just the PC in the PAV, on just their mobile, or using a mix of the PC and their mobile (for parsimony, we were unable to separate out mobile Internet from the mobile in general). There were no significant differences between the preferences of teen and adults, but plenty of variance amongst the tasks. There are two key patterns here. First, instrumental items (research, health, job search, learning new things) were much more likely to be preferred on PC only than on mobile-only, whereas social networking and entertainment skewed toward the phone. Second, the most common answers were often “a mix” of PC and phone—respondents did not want to choose between the devices. Given the choice, they would prefer to use both, in concert. This is evidence for an emerging symbiotic role of the shared PC and the phone in the communications ecosystem.

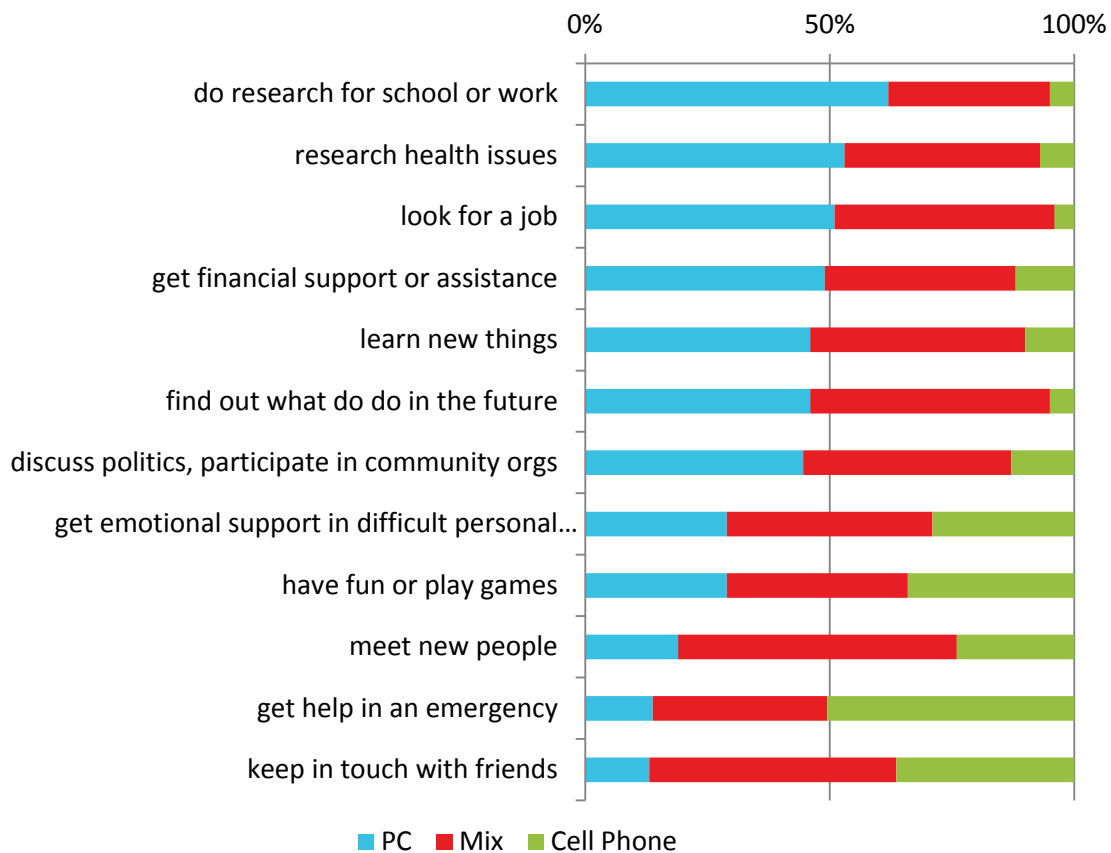


Figure 9: Stated preferences: PC versus mobile versus mix.

Taking away the “mix” option, we asked respondents: “If you had to choose between using only your phone for a month or only the computer in the center, which would you pick?” Teens were slightly more likely than adults to say the phone (61% versus 52%), although the difference was not statistically significant. We also asked this: “If Internet access was free on your cell phone network, would you still use the PAV?” The portion of teens who said they still would was 54% (63% of adults), although again, the difference was not significant.

Participants were reluctant to choose between PC and phone, which suggests that phone and PAV are not competitive substitutes, but rather, co-present or complementary. Co-present use is suggested by the fact that, despite the availability of mobiles (which were more strongly associated with social networking and entertainment), PCs continued to support many instrumental activities, such as conducting research, seeking health information, job searching, and learning new things. Venues provided more than just access to the Internet, offering safety and a space which supported learning. While cybercafés offered convenience, reliability, and quality of service, libraries highlighted their role in providing training and subsidizing the costs of communication. A certain level of complementary symbiotic use is also suggested in some of the data. Mobile Internet provides greater convenience of use, which makes it easier to integrate the online activities supported by PAVs into everyday life.

C3: Public access supports the development of digital literacies associated with hyperlinked media and large-format documents, while mobile access supports everyday social literacies and messaging.

By making this claim, we want to focus on the differences between the practices identified so far. First, we identify an academic and school-focused set of digital literacy practices, along with an associated digital habitus which values the permanence and visual design of large-format printed documents. Speedy search (rather than leisurely browsing) and cutting-and-pasting for output as printed documents were the primary interactions we observed as teens used hyperlinked media. Search was also used to learn correct meanings of standard written English words. Second, a contrasting disposition governs communication with peers. This digital habitus prioritizes the accessibility, responsiveness, and secrecy provided by both the friendship-driven genres of (primarily mobile) instant messaging and the expressively countercultural “heterographies” of texting and picture-messaging. We believe this distinction is important for considerations of non-substitutable impact. We argue that public access currently supports the development of digital literacies associated with tasks that require hyperlinked media or printed visual designs. The socially focused literacies of interacting with images and networking on Facebook also require associative reading, viewing, and linking. These currently entail significant expenditure for prepaid users, and as such, free or cheaper forms of access are preferred here, too.

Mobile access generally supports everyday social literacies and messaging (which require synchronous, frequent participation and easy accessibility). An exception here was Facebook’s instant messaging feature, which at that time was not accessible via the mobile interface. Small-scale visual design also takes place via mobile interactions through message design, in-camera image editing, and orthographies that mimic local vernaculars and speech. The cost of mobile data leads to “delinked” or offline media use, where media is shared via Bluetooth or in collocated interaction (Walton et al., 2012). The results in this respect come primarily from the phase 2 interviews.

Word Processing as Index of “Professionalism”

Word processing allowed participants to transform digital information into the (“neat,” “clean,” or “professional”) printed documents required by the classroom ecology or workplace. We observed several local practices where cut-and-paste practices predominated, and where informal assistants efficiently Googled, downloaded, and formatted information on behalf of less-skilled patrons, sometimes for a small fee, and often without looking too carefully at the guidelines or specifications on the (often densely worded) photocopied sheets of instructions from teachers. The time limits on use in libraries put users under some pressure, and the practices we observed effectively adapted research “writing” and word processing into a “match and grab” process, performed in many cases by a more skilled assistant, and truncated by the constraints of resources, skills, and language, and also by the limited time available in the library. This is a significant adaptation of educational curriculum designers’ ideas of enquiry-based learning, and also of software designers’ notions of their users’ working circumstances.

Other, more sophisticated users had been introduced to search and word processing by their teachers at school, and after doing a quick search, they were able to save the work, access it later, and then edit the copied website according to the requirements of the project. Only a few participants mentioned the importance of rewriting the material and ensuring that they understood everything that appeared in the final product. A few individuals mentioned the importance of the linguistic knowledge they could develop by using the spell and grammar checkers.

Printed communication in large format multimodal documents helps young people access upward mobility via success at school or access to institutions of higher education. Accessing and reproducing visual information for school projects drove use of public libraries, since they provided relatively reliable printing facilities at a cost of 50¢ per page. Difficulties displaying such visually-intensive pages and interfacing with these printing requirements were a distinct shortcoming of phones used as access devices for mobile Internet.

Trajectories of Participation

The usual “digital habitus” of young people and their regular genres of participation included primary participation in peer social networks centered around MXit (or Facebook) messaging. Ayanda’s anxiety about missing out on the “action” happening on MXit is illustrative of the intense involvement many teens reported. Teens told us that friendship-driven messaging played a role in supporting such interests as music, politics, religion, games, and sport. It also played a central role as a kind of academic “backchannel” where they discussed school and academic work via MXit. The heterodox orthographies and multilingual resources of mobile messaging in South Africa are documented elsewhere (Deumert & Masinyana, 2008), as is the responsiveness and creativity required to converse well on MXit (Schoon, 2012; Walton, 2010).

These messaging interactions were not directly linked to the production of textual genres of the workplace or school, focused on participation in the peer group rather than linking with web-based affinity groups.

While these networked interactions were valued sources of play, self-expression, and solidarity, the games of networked peer culture also included some more damaging variants, such as malicious gossip. As Schoon (2012) points out, the appeal of anonymous gossip sites in South Africa (e.g., outilet.com) relates to local dispositions of shame around race, class, sexuality, and gender.

Ayanda talked about how she needed to quell a piece of gossip making the rounds among her friends (via another MXit chatroom) about her having stolen another girl's boyfriend. She had also quelled the rumor by setting up a custom chatroom to confront all her friends and resolve the matter.

In Paternoster, at one of the rural Cape Access sites, the telecenter was deserted by young people because the Internet connection was broken. The operator told us that the village had their own “local web,” a minimal “guestbook” buzzing with anonymous posts of short tabloid-style updates about village activities on mobile portal www.tagtag.com, known as locally as “Tag.” Tag allowed and was mostly used for gossip (often malicious and obscene) and slander. Posts also included admonitory Bible verses, community notices about dances and soccer, discussions of available jobs, and an occasional foray into local politics: “The place is being bought out from under you by the boere [whites] but you don’t see it” (post to www.tagtag.com by user “www.vramanet.com” 18 February 2011, 12:06 p.m.). Users associated Tag with destructiveness, substance abuse, unemployment, and “barbarity,” while Facebook carried an aura of middle-class distinction or “civilization.” One commenter wrote, “Only civilized people are on Facebook, we don’t like barbarians” (post to www.tagtag.com by user “www.com” 18 February 2011, 12:06 p.m.). Schoon (2012) argues that these kinds of local online interactions can be devastating to young people living in close proximity to one another, and that such mobile discourse can, in fact, limit mobility, rather than enhance it.

Certain kinds of PAV use supported different types of online peer interactions for young people whose enforced spatial mobility meant that they had to adapt relatively frequently to new environments. In Langa, one interviewee, L, called herself a “mover,” because she had lived in six different places in her life (L, 16, f, 4 April 2011, Langa Public Library). She had attended a large number of schools, had lived in the suburbs, and had been moved in and out of foster care. Her mother had previously worked as a secretary, but was currently unemployed. Although she now lived in Langa, she travelled to school in Athlone, and she had signed up for library membership primarily in order to stay in touch with her friends. She had a large circle of over 600 Facebook friends and felt that the site was essential to acceptance in the peer group. “In our age if you are not on Facebook or MXit you are boring. Noone wants to be friends with you.” Making friends was important to her. She had met her best friend on Facebook, and she also used the site to stay in touch with old friends. She told us that she wanted to use the site to get in touch with and support other young people who were struggling with the tricky transition from suburb to township. The site also helped her cope with enforced mobility by previewing the new schools that her mother selected for her, primarily in order to identify the young people who would make up her peer group when she moved there.

L used heterodox orthographies and responsive IM-style chats on Facebook, with the addition of symbols which were borrowed from URLs and Twitter hashtags “to trigger interest,” as in the following example:

...’//... saw you izolo ... and you dint even come in my crid ... hateyou## (Wall post to www.facebook.com, recorded in interview with L, 16, f, 4 April 2011, Langa Public Library)

Secondary routes of participation involved more complicated trajectories (often requiring websites and computers) which linked such friendship maintenance and networking with mainstream interest-driven online participation, something we only found in the case of Sbu’s connection with an online community of animators.

Google search existed in the strongest area of overlap between school and peer practices. Nonetheless, online applications characteristically required extensive high-bandwidth web use and email, things which were not often available on mobile phones.

In summary, we are suggesting that, even holding aside access, there are a combination of attributes and affordances (free or low-cost bandwidth, faster bandwidth, bigger screen sizes, keyboards, printing, help, safety, and social cues) associated with PAVs which combine to support the kinds of school-focused or interest-based activities associated with middle-class participation in global informational networks, as well as with genres of interaction which may be more linked to formal employment. Thus, our data suggest an even stronger argument for the continuities between networked peer production and the traditionally middle-class amateur media production activities whereby young people have learned to imagine themselves as students, workers, and professionals via unpaid and voluntary activity (Ito et al., 2010).

As long as PCs and reliable home Internet access remain scarce—and perhaps even after that time if PAVs continue to provide safe and quiet workspaces—the PAV will provide value to resource-constrained teenagers which cannot be replaced by the mobile alone. If PAVs help teens to link to networks of interest, this may help to shape dispositions toward learning and information that go beyond the goals of local schools and are more strongly linked to academic success.

With our two remaining claims, we switch from snapshots of what *is* to discussions of what *might be*. First, we present a discussion of the role of complementary mobile and public access Internet use in the cultivation of interest-driven social networks, and second, we speculate about how PAV operators could make more of the shifts in the ecosystem which confronts them.

C4: Teens can use a combination of mobile and public access Internet resources to participate in networked media production (though not all do so) and grassroots economic mobilization (only a few).

Mobile phones are powerful enablers of photography and both audio and video recording, but publishing and downloading audio-visual media via mobile networks is expensive and can be slow. Thus, phones were used for media production and (to a lesser extent) editing media, while computers and PAVs were used to produce CDs and DVDs or browse visually intensive sites.

Most of the networked media production we encountered involved simple photo editing on feature phones. L (16, Langa Public Library) explained that she had edited her Facebook profile image using software on her feature phone, and had annotated it with the following message, using a green typeface [*ee....*]* *Hahahaah prettyy ... ** (Profile picture posted to www.facebook.com, recorded in interview with L, 16, f, 4 April 2011, Langa Public Library). The distinctive orthography, imitation of speech, and use of symbols suggest that such images were an extension of her mobile messaging practices, discussed above.

She explained that annotated and tinted shots held a certain distinction: “A picture is just a boring picture. Everything must be edited, it looks so stylish.” and that such edited shots were required if young people wanted to make new friends: “Whos wanna be your friend, whos wanna talk to you if you have a boring picture?” (ibid.).

Continuities between image editing and gossip-messaging, such as on Tag, was also apparent. An anonymous Facebook account was used by one of L’s acquaintances to post pictures of friends from their group annotated with cruel comments (in the style of American teen drama series *Gossip Girl*). Snap Shot’s acerbic annotations primarily insulted female friends’ weight, cheap shoes, unrelaxed hair, out of fashion clothing, or “expired” braids, or accused them of sleeping around.

Jayden’s a capella group used a computer to produce a CD of their songs, while another participant used the library to administer her amateur drama group and sell a DVD of their productions from a Facebook page. These examples of networked media production reveal the extent to which bandwidth and airtime constraints limited the use of the Internet and online distribution of rich media, such as audio and video.

Researching and Applying to Schools and College

In the context of a failing school system and contemporary township life, academic uses of new media can be considered a specialized form of interest-driven participation for some participants in this study. In a few cases, most notably Sbu’s, the students’ commitment to their studies extended beyond the print-based ecology of the schools to connect via new media with online networks of interest-based participation. In a couple of other cases, this interest extended to support-driven participation, or communication about financial support for their studies with sponsors outside their household or family.

Like Sbu, who applied successfully to the animation college in London, several other young people were involved in similar, if less dramatic, attempts to use online resources to change their life circumstances in some way. Four young people mentioned, much as Ayanda had, that they were using PAVs to research schools, universities, scholarships, and colleges.

Grassroots Economic Mobilization

Several of the participants in the phase 2 study reported using online communication to communicate with sponsors. This is not a central part of the repertoire of young people in middle-class contexts, who rely on parents for their economic support, but it indicates the key role that online networks can play in allowing impoverished young people to connect online with sources of support.

Three of the participants relied on email and Facebook to communicate with the person or organization sponsoring them. A used Facebook and Gmail to stay in touch with his sponsor in Canada (A, 18, m, 5 April 2011, Silulo Internet Café, Khayelitsha). Sbu had never met anyone from the company that sponsored him or his studies; he communicated with them exclusively through email. J also used email to contact her mother’s former employer to pass on the message that her mother needed money (J, 15, f, 28 April 2011, Langa Public Library). There were a few examples of mobile Internet (in particular, MXit) being used to support small business activities and informal employment. For example, S had started working part-time as a model and used Google to find his modeling agent (S, 18, m, 4 May 2011, Delft Public Library). The scarcity of editing features on low-end phones meant that the high demand for Instagram-style shots (such as on L’s profile) could be monetized. In one of the few examples of grassroots economic mobilization that we came across, one participant used a website to edit profile pictures for friends for a small fee. A similar business concept of providing cloud-based picture editing for a small fee was taken to scale soon afterwards by mobile startup Motribe with the MxPix app on the MXit platform (Maher, 2012), suggesting the ways in which, if the costs of connectivity are reduced, cloud-based services may be able to replace certain kinds of desktop or smartphone functionality for low-end mobile users.

Recruiting Networks for School

Other forms of economic participation were not related to commerce or support, but involved young people attempting to improve their circumstances by finding and gaining access to better schools or tertiary education. As argued above, this interest in further education or educational achievement can be seen as an interest-based form of participation which is not directly supported by young people's closest social networks, or even by many township schools.

Mobile Internet as an Academic Backchannel

Digital and mobile technology and the broadly social uses of public access spaces by teen peer groups were recruited as a backchannel to the regulatory and educational activities associated primarily with schools, but also with libraries.

MXit was commonly used by almost all of the interviewees to update one another about schoolwork or to assist one another with homework and projects. For example, Ayanda was able to use MXit to catch up on missed homework ("I would ask my friend through MXit") or, in the case of an accounting project, to co-ordinate contributions to a joint project ("my friends sent me figures through MXit"; Ayanda, 18, f, 14 March 2011, Langa Public Library).

MXit is thus a backchannel, but V (16, f, 17 May 2011, Langa Public Library) and S (15, m, 19 May 2011, African Access Langa) explained that it is also used as a supplement to make up for missed days at school.

To achieve their goals, young people created complementarities between their involvement in school-related affinity spaces, PAVs, and mobile Internet. Using a social networks/actor-network theory lens, we contrast the networks of those who mix the formal and the informal with those who rely more exclusively on mobiles, and the networks that accompany them.

Using NodeXL, we created network diagrams reflecting the resources (whether physical or social) used by each phase 2 participant to complete their most recent school project. These diagrams took the form of ego-centered network diagrams which mapped all the sociotechnical resources mentioned by the participant. The diagrams document only direct ties between focal individuals and the resources and people in their environment as employed for the purposes of the school project. Physical resources were labeled by category (e.g., cell phone or printer), while people were also categorized according to the person's role in relation to the participant (e.g., friend, teacher, mother, Internet café assistant). For the sake of simplicity,⁹ all ties were regarded as direct ties. Thus, they are not organized to represent the way in which access to resources was mediated by particular institutions, kinship, or other relationships.

The individual diagrams were merged to create a composite network graph (Figure 10) which shows the categories of object and the roles which the participants commonly relied upon to complete their projects. The composite graph consists of 271 separate relationships (ties or edges) and 44 distinct role and object categories (in addition to the 26 participants).

⁹ A more detailed analysis of the complex network of inter-relationships and mediation within each ego network may be attempted at a later stage.

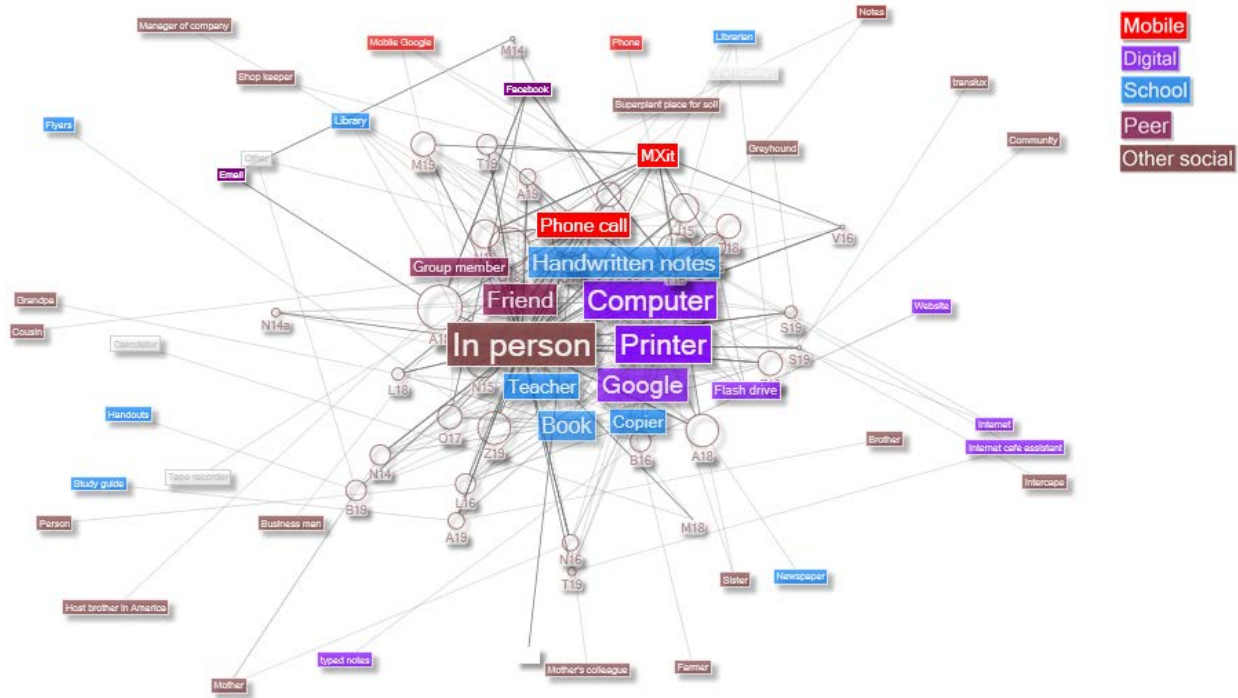


Figure 10: Relationships between participants and sociotechnical resources (school project).

Role and object categories were grouped according to their positioning in distinctive configurations of practices and resources—mostly involving literacy, but situated in distinct institutional contexts. Handwritten notes, teachers, books, libraries, and copiers were categorized as “school resources,” or associated with traditional schooled literacy practices.

New digital literacy practices and resources which involved the use of computers in some way were grouped as “digital resources.” These included assistance provided by Internet café staff, or the use of computers, printers, flash drives, websites, and search engines. Although both teachers and librarians played a role in facilitating the use of digital resources, the extent to which these two categories of people are identified with the values and practices of schooling persuaded us to group these sources of assistance with school resources.

In the South African context, digital resources and practices have only recently been introduced as a part of mass schooling. Access to digital information or media does not necessarily take place in an institutional or disciplinary context, and it is often characterized by a looser approach to copying, attribution, and citation, or is associated with the distinctive values of the digital subcultures associated with hacking, gaming, and fandom. Digital literacies can also be a mark of distinction associated with experience of certain kinds of workplaces, elite schools, or tertiary education. For all these reasons, “digital resources” were grouped separately from “school resources.” “Mobile resources” included uses of cell phones to make phone calls, for messaging (exclusively via MXit), and as a way to browse the mobile web.

It was not always clear how various social relationships and in-person communication were situated in relation to peer culture; kinship; or such institutions as schools, tertiary education, or the workplace. Thus, except in the case of institutionally defined roles such as teachers, librarians, or Internet café assistants, social relationships with peers were grouped separately as “peer resources,” relationships with other members of the participant’s social network were labeled “social resources.”

The number of ties between a given participant and the broad categories of resources in the individual ego-centered networks was used to calculate the degree of that participant’s relationship to that resource. On average,

the participants (n=51) had recruited 7.65 sociotechnical resources for their most recent school project, of which 2.51 were digital (computer-based); 3.91 were school-related literacy resources such as printed books, photocopies, or newspapers; 1.72 involved uses of their mobile phones; 1.19 were peer resources; and 1.33 were resources which did not belong to any of these categories.

Impact of Non-Local Schools

Analysis of the project network diagrams suggests that the length of time spent using public libraries or cybercafés, or a longer period of access to school libraries, was not associated with the ability to recruit a wider set of sociotechnical resources to help with school projects.

In this regard, access to better-quality schooling appeared to play a more influential role. In townships such as Langa or Delft, inadequate teaching and school facilities reflect historical and continuing inequities (formerly based on apartheid racial politics, and now based on class). Families with access to some income or resources within the extended family are likely to invest it in paying for a slightly better education than is on offer in the local neighborhood schools (in this case, in Delft, Langa, and Khayelitsha). The smaller group of participants who attended these local schools, in most cases, belonged to a household where their parent(s) were unemployed. Only two of the participants who had at least one parent in formal employment attended a local school.

Thus, attendance at non-local schools outside the townships (primarily Langa and Delft) may have indexed slightly greater household resources, access to some form of sponsorship, or lower-middle-class status. Attendance at schools outside the immediate township environment was associated with an increase in the number of resources young people were able (or expected) to recruit toward their school projects. Differences in levels of access to resources in local schools in comparison to the non-local schools became apparent in both the timelines and the project networks created by participants. On average, those attending local schools had only been using computers for 2.6 years, a significantly shorter period ($p < 0.01$) than for those attending non-local schools, who had been using computers for 6.2 years.

The number of resources recruited for the most recent school projects as summarized in the project networks was significantly lower ($p < 0.046$) for those who attended a local school (mean degree = 4.8) than for those who had been given the opportunity to attend a school outside their local area (mean degree=8.0). While there was no major difference in the extent to which they recruited peer resources (such as the assistance of friends or group members) or social resources (such as their mother's assistance) in completing the project, there were differences (albeit not statistically significant using non-parametric tests) across categories of school-based resources, digital resources, and mobile resources. Overall, there was a statistically significant association between local schooling and the extent to which participants attending local schools were able to recruit the available resources in their environments, as measured by the vertex attribute of degree for their project network diagrams.

To return to the narratives with which we opened the results, Jayden and Sandisiwe both attended local schools and recruited relatively few resources in their project networks. The network diagram Sandisiwe created did not include any school or digital resources. She had needed to research bus transport, and in order to do so, she had gone to the Cape Town bus terminal and had spoken to bus conductors from three different companies. She had worked in a group of friends, and when necessary, they had coordinated their group work by making cell phone calls.

Jayden's project network reflected his limited use of computers and the Internet. He relied on a photocopy of a picture from a library book "with its notes next to it" and worked on the project with his usual group of friends, with whom he communicated via MXit.

Sbu, by contrast, had recruited a wider range of resources, and he relied far more heavily on online communication. While waiting to register for his animation course, he occupied himself in a project called "Edu-

Rhythm,” which involved rewriting school textbooks in musical form, and recording them for release on CD. He, a friend, and a school principal used Facebook, MXit, phone calls, and email to collaborate on the project, and his specific role was to write the lyric content. The last school project Ayanda remembered completing had involved web research and books from the library. She had saved information from the web on a flash drive, and had also collaborated with friends. She received information via MXit and recorded interviews using her mobile phone’s audio recording functionality. Both Sbu and Ayanda had attended the kind of better-off non-local schools where such uses of resources were supported and, indeed, expected.

Use of Mobile Resources in Project Networks

Mobile resources such as mobile Google, MXit, and phone calls appear in just under half of the participants’ network diagrams. Mobile resources are recruited primarily in the form of phone calls for communication between peers working on the same project. MXit functioned as a low-cost supplement to this form of communication. In contrast to MXit, the mobile web is not very prominent in the project network diagrams. The mobile version of Google featured in only three diagrams.

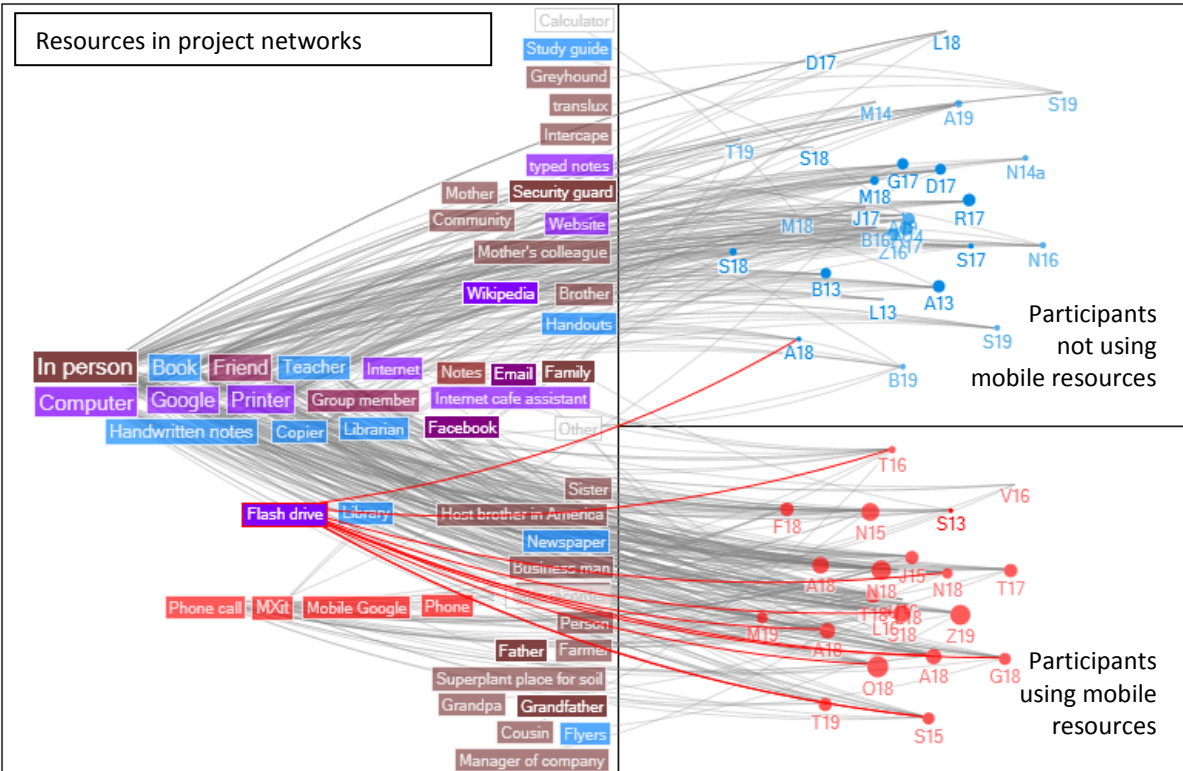
The use of mobile resources is associated with participants who attended a non-local school (Fisher’s exact test, $p < 0.05$; contingency coefficient 0.305), as summarized by Table 2.

Table 2: Use of Mobile Resources by Type of Schooling

		Mobile Resources in Project		Total
		No	Yes	
School	Local	13	4	17
	Non-local	13	17	30
Total		26	21	47

The association between non-local schools and the use of mobile resources may relate to the fact that the school friends of young people who travel out of their local area to attend school are unlikely to live in the same neighborhood. In addition, this group is relatively more affluent, so spending airtime or using data may have been more within their means.

Those who used mobile resources in their projects also seem to have been a group who were more well-equipped or sophisticated in relation to the transfer of digital data. The use of flash drives was (with one exception) also associated with this group of young people using mobile resources for their school projects.



Created with NodeXL (<http://nodexl.codeplex.com>)

Figure 11: Flash drives in project network diagrams—mobile and non-mobile users.

Mobile resources they were associated with ego-centered network diagrams of a higher connectivity (independent samples Mann-Whitney U test, $p < 0.01$), as measured using the vertex attribute degree, and this suggests that they were used in addition to other forms of media, rather than to substitute for them.

The use of mobile resources also did not appear to be substituting for print resources, but was, in fact, associated with a heavier reliance on the print resources associated with traditional schooled literacy ($p < 0.05$).

Thus, there were many examples of how networked media production was thriving on mobile platforms, and Sbu's story epitomizes the possibilities for those whose schooling and home life shapes a habitus which suggests that the online world is their oyster. For young people like Sbu, phones and PAVs offer complementary ways to recruit mobile resources. For most of the other young people we encountered, it was considerably more difficult to connect with global networks of interest, media distribution, or economic mobilization through mobile-centric participation. Nonetheless, phones enabled photography, and in-phone editing contributed to a thriving subculture of visual messaging. Bandwidth and airtime constraints limited other forms of networked media sharing, and processors limited editing capabilities. The subsidy of these costs remained a key contribution of PAVs. The book-centered habitus in libraries (rather than one centered around embodied performance or audiovisual media use), along with their rules and regulations, actively discouraged exploration of these forms of participation. Greater use of online and mobile resources in support of school work seemed to be more accessible to young people who already had some additional resources (notably non-local schooling), and perhaps also a stronger interest in academic participation.

C5: PAV operators can improve venue rules and skills to encourage the complementary use of the mobile Internet.

McEwen and Scheaffer (2012) detail how the rules of a university research library in the global North could be adjusted to be more in tune with the era of the smartphone. We see similar opportunities for the community library in the global South in the era of the data-enabled feature phone.

In our initial phase 1 discussions with PAV operators, we probed around the mobile behaviors that PAV operations could observe in their venues. For analysis purposes, we built on the differences Gomez et al. (2012) found between cybercafés and telecenters. Among the 11 cybercafés, eight said that users printed files carried in on their cell phones, and eight had seen other examples of “simultaneous use” of mobiles and PCs. Among the free venues, these observations were not entirely absent, but they were less frequent. Of the 25 we interviewed, 10 saw phones used in connection with printing, while 12 had seen instances of simultaneous use.

Some of the greater incidence of use in cybercafés was due to different services and rules enforced in the venues. Five cybercafé operators reporting having helped users register for phone-based services or configure their phone; four specifically allowed users to upload photos. But among the free venues, four blocked USB ports of upload/download from phones. Only three helped to configure phones. Another three said that their users knew more than they did about phones, anyway.

Contrast these responses from cybercafés with those below from libraries:

When they are in the internet café they are mainly working on the computers, not the phones. (Staff member, 1 March 2011, Cybercafé)

We help with everything. Whatever question. We don't mind. If it has anything to do with internet. On the phone or on the computer. We help. That is our service. (Manager, 18 February 2011, Cybercafé)

Sometimes people ask how to set up email on the phone. We help them, but charge for it. 15 min help = 10 Rand. (Staff member, 2 March, 2011, Cybercafé)

The system always gives us problems with USB connection, when they use the phone on the computers. No one was allowed to log in. We had to shut down the server and then switch on again. Almost every second day. More busy repairing the computers than using. (Senior Librarian, 28 February 2011, Public library)

Not many bring their phones. Because they come directly from school and there phones are not allowed to they leave their phones back home. (Senior Librarian, 18 February, Public library)

When we see them on MXit or Facebook we are lenient. But we tell them that it is very dangerous to have the phone with them. (Senior Librarian, 24 February 2011, Public library)

They are so smart. They don't need our assistance. We only help when they try to find work or when it is school related. Not for leisure and entertainment. And they also don't ask us for help. (Staff member, 28 February, 2011, Public library)

It is not all bad for libraries—some librarians saw the mobile Internet being used as a substitute for the fixed Internet when their own Internet was down:

For kids it's absolutely wonderful. Before, the teachers and the authority figures were the keepers of information. Now the children, within 2 minutes, will tell you that "you're wrong, I Googled it." (Senior Librarian, 11 March 2011, Public library)

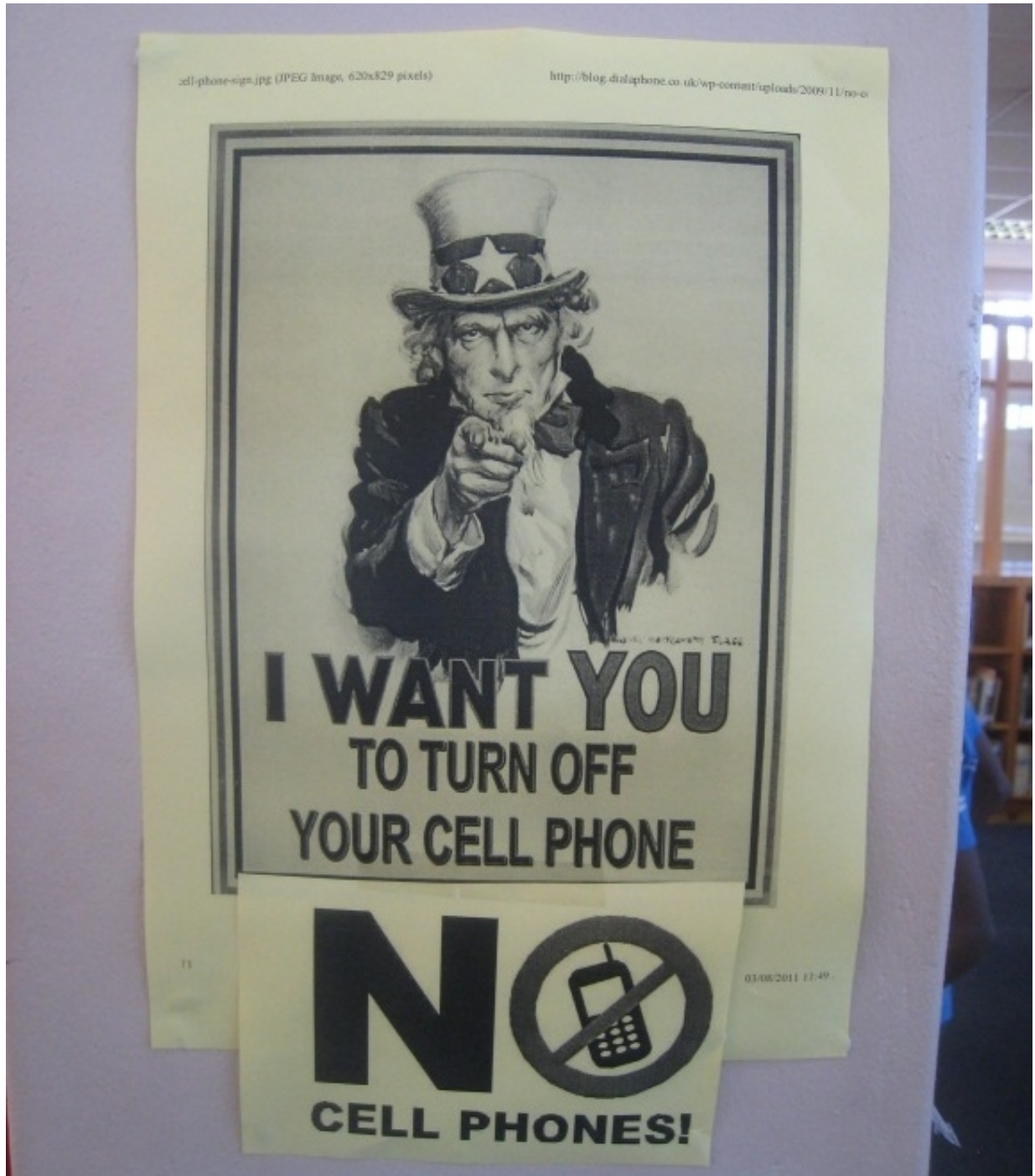
And, to come full circle, the Internet in the library is still free:

People come to the library cause the internet is free, even phones are too expensive. We've even had clients saying that they do have internet at home, but they prefer to work at the library cause they don't have to pay for the data. Phone internet is very costly, people don't have the money. (Senior Librarian, 2 March 2011, Public library)

Table 3: Illustrative Quotes on Different Approaches to the Mobile Internet

Unrelated phenomena	Functional substitutes	Complementary activities
<p>"I think one can get away with the small screen for certain things and then use the big screen for more 'work-ey' things or to look at photographs and things. The cell phone screen is too small for the important stuff." (Senior Librarian, 11 March 2011, Public library)</p>	<p>"Since the computers were stolen, there is a huge increase on mobile phone usage for accessing the mobile Internet in the library." (Senior Librarian, 1 March 2011, Public library)</p>	<p>"They upload pictures from the phone to the computer. They use Facebook, some come to the cybercafé to activate Facebook or to sign up for Gmail so that they can use it on their phones. For a fee of R10 they can activate email on the computer and also on the phone." (Manager, 23 February 2011, Cybercafé)</p> <p>"To upload photos to Facebook, download music. Most of the people have CV's or assignments saved on their phones. Some are editing their CV's on the computer and then save it again on the phone. Some go from IPod to flash drive and back and to mobile phone to Facebook and to email. They swap media a lot. But to do that they need a computer." (Staff member, 1 March 2011, Cybercafé)</p>

Figure 12: One reason there is little complementary use.



In summary, we heard more reports of complementary mobile Internet use among cybercafés than among free venues. A virtuous cycle of wealthier users (with more access to data-enabled handsets, fewer rules, and younger,

perhaps more tech-savvy staff) meant that cybercafés were adapting their business to benefit from the arrival of the mobile Internet. The free venues were less helpful.

The number one thing preventing more complementary use of mobile Internet and shared access PCs is the set of rules in place in each the venue. Nine of the 11 cybercafés had no rules in place about cell phone use. By contrast, six of the libraries had total bans, eight said that phones must be silent, and another four specified that phones were not to be connected to the PCs. In addition to fears about viruses, and the (understandable) concern that voice calls would disrupt quiet library spaces, phones, with their association to MXit, probably got lumped together with Facebook, which had also been banned from many of the libraries we spoke to.

Threat or Opportunity? It Depends on the Framing

We concluded our initial phase 1 interviews with a question about how the operators perceived the arrival of the mobile Internet, as a threat or an opportunity for the venue. Opinions here were quite mixed. Perhaps about half of cybercafé operators perceived the mobile Internet as a threat (the other half were enthusiastic), while only three of 25 free venues expressed an assessment that mobile Internet would pull people away from their venues (and in two cases, from books in general). Indeed, 13 of the 25 operators of free venues suggested that *as long as their locations were free and the mobile Internet was not, there was no threat of substitution.*

Table 4: Threat or Opportunity? PAV Owner Assessments of Mobile Internet

	Cybercafés	Free venues (library, NGO)
<i>"Not a threat"</i>	<p>"I think it is good that people are more independent. But there will be still need big screens and assistance and printing. So far we are still safe." (Staff member, 1 March 2011)</p> <p>"So it's maybe positive, cause more people are joining sites like Facebook or learning to Google, and after getting a small taste on their phone they want to come in here for the 'real deal.' PCs are just easier man." (Manager, 3 March 2011)</p>	<p>"Mobile internet will help to relieve pressure on the library computers. They only have 5 computers—that is not enough! Librarians are often involved in conflict resolution because users get upset, jump queues, sneak in ahead of others who were there first, complain that kids are using the computers to do unimportant things when they are doing something more important such as looking for a job." (Senior Librarian, 10 February 2011, Public library)</p> <p>"Possibly positive—The Wi-Fi attracts more people into the library space. The more comfortable people get with the mobile internet and knowledgeable about it—the more people we would possibly attract here, and once they are here we expose them to this massive media hub—books, DVDs, audiobooks, etc.)" (Librarian, 8 April 2011, Public library)</p>
<i>"A threat"</i>	<p>"Mobile internet is not good for internet Cafes. Why would the people come still here? Only thing they want to do is print out and copy. Libraries are different, there it is for free." (Manager, 23 February 2011)</p>	

Only two of the cybercafés and none of the free venues offered repair services for phones. Eight of the 11 cybercafés had, in the last two weeks, given out advice to users about how to use their phones. Only two of the 25

free venues had offered similar advice. What kind of enthusiasm is reflected in this statement from one of the libraries?

One of our volunteers has communication problems and learning difficulties, but he is great with the computers. He wants to do good and help others, but we think he is taken advantage of to download music from and then pass it on via Bluetooth. (Senior Librarian, 8 March 2011, Public library)

User Feedback on What PAVs Could Do with Mobiles

There was little difference between teens and adults in terms of their suggestions for what the PAV could do differently to make better use of mobiles. Highest-rated answers included allowing Wi-Fi connections, printing directly from phones, and booking places at PCs by SMS or phone.

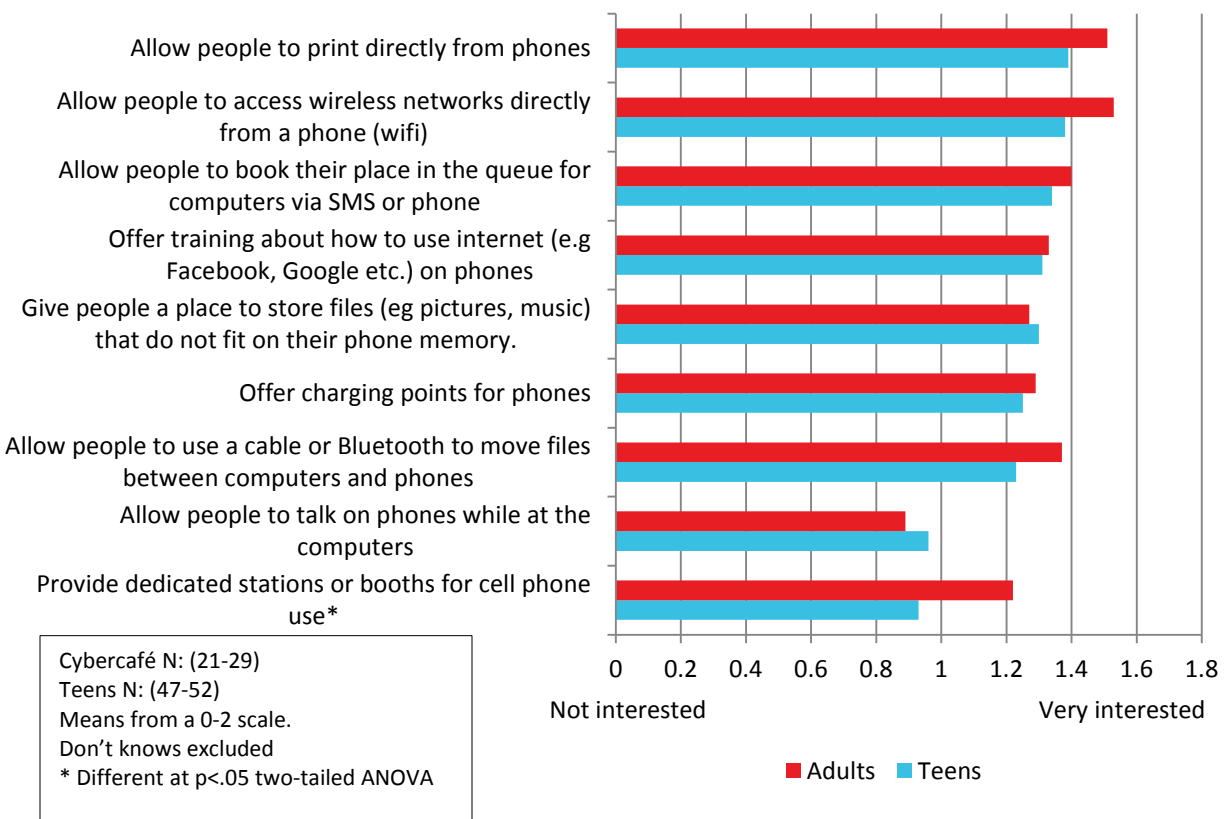


Figure 13: Things a PAV could do with mobiles.

In summary, there is an opportunity for PAVs to not simply follow the lead of cybercafés, but rather, to go further. Through a combination of staff training, updated rules (silence remains golden, but keep the wireless data flowing), some better antivirus software, a Wi-Fi connection (cost permitting), and perhaps some cabling and charging stations, PAVs could provide valuable mobile-related services to users. Even relatively low-resourced PAVs could orient to the mobile Internet in a new way. With a relatively modest investment in materials, time, and training, PAV owners and frontline staff could begin to treat the mobile Internet less as an affliction (social networking) or threat (substitution), and more like the complement which the network analysis and interviews suggest it can be.

8. CONCLUSION

This report has covered a large amount of ground, presenting findings from three interconnected data gathering exercises in a variety of ways. We started with four illustrative stories from Sbu, Sandisiwe, Jayden, and Ayanda, and then we contextualized and generalized from these stories via five overarching claims. Three claims addressed how things are:

C1A: Public access and private mobiles offer different affordances. Among low-income users, free use (such as that in a library) supports more resource-intensive goals (storage space, time, bandwidth) and stable media production, while paid use (such as via a phone) supports time-sensitive goals and transient media production.

C1B: Teenage users have developed complex, fine-grained practices which help them to negotiate the respective strengths and weaknesses of public access and private mobiles—including practices that help to minimize costs and maximize convenience—and a keen sense of which affordances or use settings will be more productive to reach given goals.

C2: The PAV provides non-substitutable impact to resource-constrained users, even those with “the Internet in their pocket.”

C3: Public access supports the development of generative digital literacies associated with hyperlinked media, while mobile access supports everyday social literacies.

Two claims addressed how things could be:

C4: Teens can use a combination of mobile and public access Internet resources to participate in generative social networks (though not all do so).

C5: PAV operators can improve venue rules and skills to encourage the complementary use of the mobile Internet.

To return to the theoretical model from the introduction, we can add a row linking these conditions to the current and future states assessed in the claims. A view of mobile phones as an equalizing force which will move South Africa away from “digital apartheid” toward “digital democracy” in education (Brown & Czerniewicz, 2010) is thus unfortunately not (yet?) entirely supported by our findings. Instead, we found that mobile phones are appropriated to support social dispositions associated with various, often-conflicting orientations. While we encountered many young people using mobile internet to support their education, their motivations also suggested a wide range of other goals (not all of which were necessarily compatible) notably status among peers, street life, sexuality, participation in popular culture, gossip, and surviving enforced mobility or immobility.

Our interactions with teenage PAV users did not offer much evidence to support a claim that the free PAV and paid mobile Internet access are functional substitutes. Instead, to a certain extent, they are largely unrelated phenomena, at least in terms of the ways they are learned and (more important) the habitus they support.

Table 5: Framing PAV and Mobile Internet Use

	If mobile Internet use and PAV use are....		
	Functional substitutes	Unrelated phenomena	Complementary activities
Overall summary	Current public access users stop coming, rely on mobile; other potential PAV users never elect to walk through the door	Reconfiguration of ICT repertoire; some tasks to mobile Internet, some to PAV; few linkages or synergies between the platforms	An augmentation of utility and use of public ICT access
Macro implications for PAVs	Shrinking community/utility	Changing role for PAVs, requiring the reconfiguration of the array of services on offer	Positive impacts of private mobile use are not necessarily reflected in “more hours in more PAV seats,” but in successful reconfiguration and facilitation of ecosystem
Links to Claims		“How things are” C1A, C1B, C2, C3	“How things could be” C4, C5

Looking beyond our sample, this study provides considerable evidence of the importance of PAVs in the lives of a wide range of young people. In the South African context, PAVs provide a safe space where young people can focus on schoolwork, learn from peers, enjoy some level of access to online resources, and engage in genres of online participation which could potentially allow them to improve their chances of success at school or connect with more powerful networks in society.

This study compares the “genres of participation” identified by Ito et al. (2010) with new and specific forms of networked public participation emerging as mobile phones extend online interaction to young people around the world. We argue that affinity-based, interest-driven, or employment-linked connections of the kind associated with academic or professional networking are currently not strongly supported by teens’ uses of the mobile Internet (particularly when this focuses on instant messaging via MXit). We identify a distinctively mobile digital habitus where the spaces for friendship-driven participation are somewhat disconnected from other online spaces centered around interest-driven participation, particularly those where young people can make contact with “weak ties” (Granovetter, 1982). Given the structure and history of South African society, it seems possible that weak ties are more likely to be able to assist young people struggling to progress in conventional education. This broader lens nonetheless complicates clean distinctions between instrumentality and the rest of life (Hargittai & Hinnant, 2008; Ito et al., 2010; Kolko & Putnam, 2009).

Recruiting Sociotechnical Resources

We found a dual influence on the digital habitus. On the one hand, friendship played a key role in young people’s adoption of digitally supported practices while on the other institutions such as school and work were also influential. The gaps between the online networks, practices, and genres of participation associated with these different social contexts in South Africa means that young people here may be less likely to connect with opportunities for further study, sponsorship, or employment via their everyday online activities. Our fifty three interviews identified only one young person who was using PAVs and mobile Internet to connect extensively with others in online affinity spaces, honing his interest in animation into a successful application to a course of higher education. Other young people with more constrained access to cash, computers, and middle-class schooling had far more limited opportunities to connect with interest-driven genres of online participation. Facebook certainly

allows young people to connect with those beyond their immediate social networks and make contact with others who have greater access to resources, or who can assist them in sharing their specialized interests, but these interactions are supported (and spurred on by) their existing circumstances. The more affordable MXit had a less open architecture and did not appear to support the same kind of interest-driven connections to online groups, communities and information.

Thus, while it was possible to use online resources to facilitate transitions between friendship-driven and interest-driven participation as happens in the United States, this trajectory was not characteristic of the group we interviewed. Our data suggests that public access resources were most useful to those young people whose sociotechnical networks were already extended beyond their local environment through attendance at non-local schools. These schools took them into a somewhat different habitus, and out of the immediate township environment. Thus, it is not surprising that they were also the group taking advantage of the widest range of informational resources, and of mobile communication in particular—their needs, as well as their opportunities, were likely to have been greater. Nonetheless, the costs of bandwidth and the time limitations of free PAVs mean that extensive participation in sites centered around the production and exchange of user-generated content are currently out of reach of most young people in this environment.

Project network diagrams produced by participants suggest that attendance at non-local schools is associated with certain advantages which allow young people to recruit more of the sociotechnical resources in their environment. Better schools and a diversity of resources probably correlate with marginally better economic and class status, something which allows or motivates attendance of schools outside the local environment. Providing PAVs may be beneficial, but it does not compensate for the kinds of opportunities lost by those young people deprived of the advantages of middle-class schooling.

The use of mobile communication in school research projects appears to supplement, rather than substitute for, computer-based and school-based resources, such as books and other printed materials. Young people who already enjoy certain advantages appear to be more likely to adopt various forms of communication via the mobile web, Facebook apps, or MXit texting, and also to recruit them as supplemental forms of interpersonal communication, rather than as a replacement for web use or other informational literacy practices.

Mobile Resources in a Divided Habitus

We argue that the specific characteristics of participation in this context are shaped by the particular digital “habitus” in which young people learn to use digital and mobile resources. Currently, in this context, knowledge of computer-based resources is developed at school in the first place—and to a somewhat lesser extent, via the peer group. By contrast, the peer group is the primary way of learning to use the mobile Internet. Until recently, this has been dominated by MXit, with Facebook playing an increasingly important role. There is currently a substantial gap between everyday skills in mobile Internet use and practices valued at school. Only a few individuals were extending their peer-focused participation on MXit to interest-driven participation in online affinity spaces. Such participation appeared to be curtailed in the first place by the political economy of mobile communication, which commodifies all participation, thus restricting participation by young people with a shortage of cash, and advantaging those who have access to additional resources. In the second place, we also draw attention to the particular social characteristics of MXit, which accommodates young people’s severely restricted budgets and their need for a private space for self-expression and transgression of adult mores, but which is relatively disconnected from adults—and as such, from opportunities for work or education. Third, while MXit functioned as a supplement to (and informal backchannel for) formal schooling, the application’s architecture at that time also curtailed certain types of interest-driven participation, notably those associated with other social networks such as Facebook or MySpace, and thus limited the development of interest-driven social networks and young people’s involvement in publishing user-generated content.

The connections between Sbu’s *ikasi* context, his friendships with Japanese animation fans, and his almost successful attempt to undertake studies at a London animation school suggests “what could be”—the power and

promise of mobile communication for this group of young people born in South Africa's year of freedom. The actual freedoms afforded by mobile communications depend on who can afford to participate by accessing the requisite cash and other sociotechnical resources, many of which are intricately connected to middle-class biographical trajectories. For most of the young people we interviewed, these freedoms were dramatically curtailed—both the freedoms of mobile communication and the extent to which they could utilize the spaces set aside to ensure that they could enjoy free public access to online participation.

Welcoming Mobiles to the Library

One thing which struck us in the in-depth interviews was how, to the extent that teens have developed sophisticated strategies for optimizing their options in the communicative ecosystem, they have done so on their own, or with the help of peers, but not with the help of intermediaries or institutions. By talking to the cybercafés, we saw inklings of what a physical digital space with reliable and inexpensive connections to the Internet could look like. Though cybercafés will charge the equivalent of a dollar or two to help a user set up a phone, they are generally more than happy to allow that user to connect the phone to the café infrastructure for uploads and downloads. In a sense, the phones, serving as both storage devices and auxiliary Internet access devices, can engage in advance with the cybercafé to make optimal use of bandwidth, place, screen size, etc.

Contrast that with the story in most libraries, at least in Cape Town. At a basic level, the “rules” prohibiting cell phone use in libraries are simply about noise management, but when we unpacked those rules in discussions with operators, we saw that the rules are reflective of a group that either doesn't think very much about mobile Internet, or allows negative associations about time wasting, dangerous social networks, viruses, and the like to obscure the remarkable power of a personal digital device that is linked to a shared access resource. Phones could be storage devices for files, cutting down on expensive printing and increasing the coherency of people's time-limited experiences in the PAV. Phones could allow users to schedule their time at the PAV in advance. Phones could allow groups of users to send content back and forth for projects or resource sharing. Indeed, phones could minimize the pressure on libraries to give enough time for everyone; two of the central libraries had instituted Wi-Fi options, something which could be extended system-wide for the cost of a wireless router in each facility.

Part of the appeal of the library PAVs remains free (subsidized) bits, in a country where retail data through any channel remains expensive. The choice to institute free or subsidized Wi-Fi cannot be made lightly, and provisions need to be in place to fund PAVs for the cost of their bandwidth. As an aside, the PAVs offering free Wi-Fi were struggling to meet the demand, and they had seen considerable increases in their monthly bills, as more and more library users had begun to avail themselves of the Wi-Fi, either through laptops or cell phones.

This seems like a minor set of changes to regulations on the ground, but those changes, if implemented system-wide, might have signal affects about the utility of the mobile Internet for agency, personal networking, and personal productivity. Mindsets are shifting quickly on the ground, as more data-enabled phones reach further into traditionally resource-constrained communities, but our sense is that, as of 2011, the users were out ahead of the PAVs in terms of digital competencies and digital demands.

Librarians and other PAV operators outside of those in for-profit cybercafés may need specific training and encouragement to reorient toward the opportunities presented by the mobile Internet. They will also need USB cables and up-to-date antivirus programs, but these are relatively minor fixes.

As we mentioned in the beginning of the discussion section, this research project was designed neither as an assessment of the current impact of mobile Internet use on socioeconomic development, nor as a means to project or predict technology use in the long term. Lower-cost, more powerful, and “converged” devices are coming, and we are confident that some teens—the next generation of Sbus, Jaydens, Ayandas and Sandisiwes—will be able to craft different strategies to take advantage of them, and perhaps to extend more of their computing habitus outside of the PAV. But in the meantime—until those choices are within practical reach—the snapshot we

offer is one of a continuing practical and conceptual split between (public) PCs and (private) mobiles. We see little or no evidence that the demand for PAVs among resource-constrained, mobileInternet-using teenagers will decline in the near term. Big screens; faster and cheaper bandwidth; and the desire for a quiet, safe place to study, work, and play will all remain. The steps we suggest for policy makers and venue providers can be undertaken immediately, in time to still help this generation of teens, rather than the next one.

9. REFERENCES

- Ajao, O. (2012). Are mobile phones pushing cyber cafes out of business? *ICTworks*. Retrieved September 29, 2012, from <http://www.ictworks.org/news/2010/05/10/are-mobile-phones-pushing-cyber-cafes-out-business>
- Bar, F., & Best, M. L. (2008). Assessing the impact of public access to ICTs. *Information Technologies & International Development*, 4(3). Retrieved from <http://itidjournal.org/itid/article/view/296/128>
- Bar, F., Brough, M., Costanza-Chock, S., Gonzalez, C., Wallis, C. J., & Garces, A. (2009). Mobile voices: A mobile, open source, popular communication platform for first-generation immigrants in Los Angeles. (Paper presented at “*Mobile 2.0: Beyond Voice?*” Pre-conference Workshop at ICA2009, Chicago, IL). Retrieved from http://lirneasia.net/wp-content/uploads/2009/05/final-paper_bar_et_al.pdf
- Bar, F., Pisani, F., & Weber, M. (2007). Mobile technology appropriation in a distant mirror: Baroque infiltration, creolization and cannibalism. (Paper presented at *Seminario Sobre Desarrollo Economico, Desarrollo Social y Comunicaciones Moviles in America Latina*, pp. 1–40, Buenos Aires). Retrieved from http://www.imaginar.org/mbanking/mobile_technology_appropriation.pdf
- Barton, D. (1994). *Literacy: An introduction to the ecology of written language*. Oxford, UK: Blackwell.
- Benbunan-Fich, R. (2001). Using protocol analysis to evaluate the usability of a commercial web site. *Information & Management*, 39(2), 151–163. doi:10.1016/S0378-7206(01)00085-4
- Bloch, G. (2009). *The toxic mix: What’s wrong with South Africa’s schools and how to fix it*. Cape Town: Tafelberg.
- Bosch, T. (2008). Wots ur ASLR? Adolescent girls’ use of cellphones in Cape Town. *Commonwealth Youth and Development*, 6(2). Retrieved from http://www.sabinet.co.za/abstracts/cydev/cydev_v6_n2_a5.html
- Botha, A., Batchelor, J., & Ford, M. (2009). Once upon a time in a mobile world. In *Proc. mLife 2009* (Vol. 2). London: Mobile Government Consortium International. Retrieved from <http://www.m4life.org/proceedings/2009/mLife2009.pdf>
- Bourdieu, P., & Wacquant, L. (1992). *An invitation to reflexive sociology*. Chicago: University of Chicago Press.
- Bray, R., Gooskens, I., Kahn, L., Moses, S., & Seekings, J. (2010). *Growing up in the new South Africa: Childhood and adolescence in post-apartheid Cape Town*. Cape Town: HSRC Press.
- Bremen, N. (2011). Why MXit is Africa’s largest social network. *Memeburn*. Retrieved from <http://memeburn.com/2010/10/why-mxit-is-south-africas-largest-social-network/>
- Brown, C., & Czerniewicz, L. (2010). Debunking the “digital native”: Beyond digital apartheid, towards digital democracy. *Journal of Computer Assisted Learning*, 26(5), 357–369. doi:10.1111/j.1365-2729.2010.00369.x
- Butgereit, L. (2007, April 18–20). Math on MXit: Using MXit as a medium for mathematics education. (Paper presented at *Meraka INNOVATE Conference for Educators, CSIR*, Pretoria). Retrieved from <http://hdl.handle.net/10204/1614>
- Carrington, V. (2005). The uncanny, digital texts and literacy. *Language & Education: An International Journal*, 19(6), 467–482. doi:10.1080/09500780508668698

- Cartier, C., Castells, M., & Qiu, J. L. (2005). The information have-less: Inequality, mobility, and translocal networks in Chinese cities. *Studies in Comparative International Development*, 40(2), 9–34. doi:10.1007/BF02686292
- Castells, M., Fernández-Ardèvol, M., Qiu, J. L., & Sey, A. (2007). *Mobile communication and society: A global perspective*. Cambridge, MA: MIT Press.
- Chaffee, S. H. (1982). Mass media and interpersonal channels: Competitive, convergent, or complementary? In G. Gumpert & R. Cathcart (Eds.), *Inter/media* (2nd ed., pp. 57–77). New York: Oxford University Press.
- Chetty, M., Banks, R., Brush, A. J. B., Donner, J., & Grinter, R. E. (2011). While the meter is running: Computing in a capped world. *Interactions*, 18(2), 72–75. Retrieved from <http://mags.acm.org/interactions/20110304?pg=74#pg74>
- Chigona, A., & Chigona, W. (2009). MXit up in the media: Media discourse analysis on a mobile instant messaging system. *The Southern African Journal of Information and Communication*, 9(2), 42–57. Retrieved from <http://www.sajic.org.za/index.php/SAJIC/article/view/193/0>
- Chigona, W., Beukes, D., Vally, J., & Tanner, M. (2009). Can mobile internet help alleviate social exclusion in developing countries? *The Electronic Journal of Information Systems in Developing Countries*, 36, 1–16. Retrieved from <http://www.ejisd.org/ojs2.../index.php/ejisd/article/view/535>
- Chigona, W., Chigona, A., Ngqokelela, B., & Mpofu, S. (2009). MXIT: Uses, perceptions and self-justifications. *Journal of Information, Information Technology, and Organizations*, 4, 1–16. Retrieved from <http://www.jiito.org/articles/JIITov4p001-016Chigona369.pdf>
- Chigona, W., Lekwane, O., Westcott, K., & Chigona, A. (2011). Uses, benefits and challenges of public access points in the face of growth of mobile technology. *The Electronic Journal of Information Systems in Developing Countries*, 49, 1–14. Retrieved from <http://www.ejisd.org/ojs2/index.php/ejisd/article/view/866>
- Chigona, W., & Licker, P. (2008). Using diffusion of innovations framework to explain communal computing facilities adoption among the urban poor. *Information Technologies & International Development*, 4(3), 57–73. Retrieved from <http://itidjournal.org/itid/article/view/302>
- Chiumbu, S. (2012). Exploring mobile phone practices in social movements in South Africa – The Western Cape Anti-Eviction Campaign. *African Identities*, 10(2), 193–206. doi:10.1080/14725843.2012.657863
- Czerniewicz, L., & Brown, C. (2010). Born into the digital age in the south of Africa: The reconfiguration of the “digital citizen.” In *Proc. Networked Learning 2010* (pp. 859–865). Lancaster, UK: Lancaster University. Retrieved from <http://www.lancs.ac.uk/fss/organisations/netlc/past/nlc2010/abstracts/PDFs/Czerniewicz.pdf>
- de Souza e Silva, A., Sutko, D. M., Salis, F. A., & de Souza e Silva, C. (2011). Mobile phone appropriation in the favelas of Rio de Janeiro, Brazil. *New Media & Society*, 13(3), 411–426. doi:10.1177/1461444810393901
- Deumert, A., Oscar Masinyana, S., & Masinyana, S. O. (2008). Mobile language choices — The use of English and isiXhosa in text messages (SMS): Evidence from a bilingual South African sample. *English World-Wide*, 29(2), 117–147. doi:10.1075/eww.29.2.02deu
- Dimmick, J. W., Feaster, J. C., & Ramirez, A. (2011). The niches of interpersonal media: Relationships in time and space. *New Media & Society*, 13(8), 1265–1282. doi:10.1177/1461444811403445

- Donner, J. (2008). Research approaches to mobile use in the developing world: A review of the literature. *The Information Society*, 24(3), 140–159. doi:10.1080/01972240802019970
- Donner, J., & Gitau, S. (2009). New paths: Exploring mobile-centric internet use in South Africa. In “*Mobile 2.0: Beyond Voice?*” Pre-conference Workshop at the International Communication Association (ICA) Conference, Chicago, Illinois. Retrieved from http://irneasia.net/wp-content/uploads/2009/05/final-paper_donner_et_al.pdf
- Donner, J., Gitau, S., & Marsden, G. (2011). Exploring mobile-only Internet use: Results of a training study in urban South Africa. *International Journal of Communication*, 5, 574–597. Retrieved from <http://ijoc.org/ojs/index.php/ijoc/article/view/750/543>
- Donovan, K., & Donner, J. (2010). A Note on the availability (and importance) of pre-paid mobile data in Africa. In J. Svensson & G. Wicander (Eds.), *Proceedings of the 2nd International Conference on M4D: Mobile Communication Technology for Development* (pp. 263–267). Karlstad, Sweden: Karlstad University.
- Equal Education. (2010). *We can't afford not to: Costing the provision of functional school libraries in South African Schools*. Education. Khayelitsha, South Africa. Retrieved from <http://www.equaleducation.org.za/sites/default/files/>
- Fleisch, B. (2008). *Primary education in crisis: Why South African schoolchildren underachieve in reading and mathematics*. Landsdowne, South Africa: Juta and Company.
- Gee, J. P. (2003). What video games have to teach us about learning and literacy. *Computers in Entertainment*, 1(1), 20. doi:10.1145/950566.950595
- Gee, J. P. (2005). Semiotic social spaces and affinity spaces: From the age of mythology to today's schools. In D. Barton & K. Tusting (Eds.), *Communities* (pp. 214–232). Cambridge, UK: Cambridge University Press.
- Gitau, S., Marsden, G., & Donner, J. (2010). After access: Challenges facing mobile-only internet users in the developing world. In *Proc. CHI 2010* (pp. 2603–2606). New York: ACM. doi:10.1145/1753326.1753720
- Goldstuck, A. (2010). The mobile internet pinned down. Retrieved from <http://www.worldwideworx.com/archives/247>
- Gomez, R., Pather, S., & Dosono, B. (2012). Public access computing in South Africa: Old lessons and new challenges. *Electronic Journal of Information Systems in Developing Countries*, 52. Retrieved from <http://www.ejisdc.org/ojs2/index.php/ejisdc/article/view/915>
- Granovetter, M. (1982). The strength of weak ties: A network theory revisited. In P. V. Marsden & N. Lin (Eds.), *Sociological Theory* (pp. 105–130). Newbury Park, CA: SAGE Publications.
- Haddon, L., & Vincent, J. (2005). Making the most of the communications repertoire: Choosing between the mobile and fixed-line. In K. Nyíri (Ed.), *The Global and the Local in Mobile Communication* (pp. 231–240). Vienna: Passagen Verlag.
- Hargittai, E. (2010). Digital Na(t)ives? Variation in internet skills and uses among members of the “net generation.” *Sociological Inquiry*, 80(1), 92–113. doi:10.1111/j.1475-682X.2009.00317.x
- Hargittai, E., & Hinnant, A. (2008). Digital inequality: Differences in young adults' use of the Internet. *Communication Research*, 35(5), 602–621. doi:10.1177/0093650208321782

- Higgs, N. T. (2006). Measuring and understanding the well-being of South Africans: Everyday quality of life in South Africa. *Social Indicators Research*, 81(2), 331–356. doi:10.1007/s11205-006-9012-3
- Horst, H. A., & Miller, D. (2005). From kinship to Link-up: Cell phones and social networking in Jamaica. *Current Anthropology*, 46(5), 755–778. doi:10.1086/432650
- Hsieh, J. J. (2011). Addressing digital inequality for the socioeconomically disadvantaged through government initiatives: Forms of capital that affect ICT utilization. *Information Systems Research*, 22(2), 233. doi:10.1287/isre.1090.0256
- Ito, M., Baumer, S., Bittanti, M., Pascoe, C. J., Antin, J., Finn, M., Law, A., et al. (2010). *Hanging out, messing around, and geeking out: Digital media*. Cambridge, MA: MIT Press. Retrieved from <http://mitpress.mit.edu/catalog/item/default.asp?tttype=2&tid=11889>
- ITU. (2011a). Mobile-cellular subscriptions per 100 inhabitants, 2001–2011. *ITU Free Statistics*. Retrieved from http://www.itu.int/ITU-D/ict/statistics/material/excel/2011/Mobile_cellular_01-11.xls
- ITU. (2011b). Online statistics, ICTeye. Geneva: International Telecommunication Union. Retrieved from <http://www.itu.int/ITU-D/icteye/Default.aspx>
- James, T., Finlay, A., Jensen, M., Neville, M., & Pillay, R. (2011). Public access ICT in South Africa. In R. Gomez (Ed.), *Libraries, telecentres, cybercafes and public access to ICT* (pp. 429–451). Hershey, PA: IGI Global. Retrieved from <http://www.igi-global.com/chapter/public-access-ict-south-africa/55852>
- Jenkins, H. (2006). *Convergence culture: Where old and new media collide*. New York: NYU Press.
- Kolko, B., Racadio, R., Deibel, K., Krause, K., & Prempeh, J. (2012). The value of non-instrumental computer use: Skills acquisition, self-confidence, and community-based technology teaching. *Global Impact Study Research Report Series*. Seattle: Technology & Social Change Group, University of Washington Information School.
- Kolko, B. E., & Putnam, C. (2009). Computer games in the developing world: The value of non-instrumental engagement with ICTs, or taking play seriously. *2009 International Conference on Information and Communication Technologies and Development* (pp. 46–55). IEEE. doi:10.1109/ICTD.2009.5426705
- Kolko, B. E., Rose, E. J., & Johnson, E. J. (2007). Communication as information-seeking: The case for mobile social software for developing regions. *WWW '07 Proceedings of the 16th international conference on World Wide Web* (pp. 863–872). New York: ACM Press. doi:10.1145/1242572.1242689
- Kreutzer, T. (2009). *Generation mobile: Online and digital media usage on mobile phones among low-income urban youth in South Africa*. Cape Town: University of Cape Town. Retrieved from <http://www.tinokreutzer.org/mobile/MobileOnlineMedia-SurveyResults-2009.pdf>
- Kvasny, L., & Keil, M. (2006). The challenges of redressing the digital divide: A tale of two US cities. *Information Systems Journal*, 16(1), 23–53. doi:10.1111/j.1365-2575.2006.00207.x
- Larghi, S. B., Mogueillansky, M., Aguerre, C., Fontecoba, A., Orchuella, J., Calamari, M., de León, J. P., et al. (2010). Conceptual and methodological problems in the study of ICT appropriation process by low-income urban youth in Argentina. *Proceedings of IPID Postgraduate Strand at ICTD 2010* (p. 30). Retrieved from <http://kau.diva-portal.org/smash/get/diva2:425814/FULLTEXT01#page=33>

- Latour, B. (2005). Reassembling the social: An introduction to actor-network-theory. *Pol y Sociedad*, 43, 301. Retrieved from <http://books.google.com/books?id=DlgNiBaYo-YC&pgis=1>
- Licoppe, C. (2004). "Connected" presence: The emergence of a new repertoire for managing social relationships in a changing communication technoscape. *Environment and Planning D: Society and Space*, 22(1), 135–156. Retrieved from <http://www.envplan.com/epd/abstracts/d22/d323t.html>
- Ling, R., & Yttri, B. (2002). Hyper-coordination via mobile phones in Norway. In J. E. Katz & M. A. Aakhus (Eds.), *Perpetual contact: Mobile communication, private talk, and public performance* (pp. 139–169). Cambridge, UK: Cambridge University Press.
- Maher, V. (2012, July 19). Motribe launches MxPix, photo filtering in Mxit. Retrieved from <http://blog.motribe.com/2012/06/08/motribe-launches-mxpix-photo-filtering-in-mxit/>
- Mavers, D. (2002). Interpreting the externalised images of pupils' conceptions of ICT: Methods for the analysis of concept maps. *Computers & Education*, 38(1-3), 187–207. doi:10.1016/S0360-1315(01)00074-4
- McEwen, R., & Scheaffer, K. (2012). Orality in the library: How mobile phones challenge our understandings of collaboration in hybridized information centers. *Library & Information Science Research*, 34(2), 92–98. doi:10.1016/j.lisr.2011.08.001
- Morgan Stanley Research. (2009). *The mobile internet report: Ramping faster than desktop internet, the mobile internet will be bigger than most think*. New York: Morgan Stanley & Co.
- Nardi, B., & O'Day, V. (1999). *Information ecologies: Using technology with heart*. Cambridge, MA: MIT Press.
- Nitsckie, W. B., & Parker, M. B. (2009). Mobile instant messaging: "Help at the fingertips of addicts." *Informatics & Design Papers and Reports, Cape Peninsula University of Technology*. Cape Town. Retrieved from http://dk.cput.ac.za/inf_papers/24/
- North, S., Bulfin, S., & Snyder, S. (2008). Digital tastes: Social class and young people's technology use. *Information, Communication & Society*, 11(7), 895. doi:10.1080/13691180802109006
- Olmsted-Hawala, E. L., Murphy, E. D., Hawala, S., & Ashenfelter, K. T. (2010). Think-aloud protocols. In *Proceedings of the 28th International Conference on Human Factors in Computing Systems - CHI '10* (p. 2381). New York: ACM Press. doi:10.1145/1753326.1753685
- Oyedemi, T. D. (2009). Social inequalities and the South African ICT access policy agendas. *International Journal of Communication*, 3, 151–168. Retrieved from <http://ijoc.org/ojs/index.php/ijoc/article/view/347/304>
- Pallitt, N. (2008). *Children's discourse patterns and literacy software: A case study of software in use*. Cape Town: University of Cape Town.
- Parker, M. B., Wills, G., & Wills, J. (2008). *Community in Tension (CIT)*. Southampton, UK: University of Southampton. Retrieved from <http://eprints.ecs.soton.ac.uk/16678/>
- Patel, K. (2011, September 11). Analysis: Zuma's speech to Fedusa—Jobs, jobs, and again, jobs. *Daily Maverick*. Retrieved from <http://dailymaverick.co.za/article/2011-11-09-analysis-zumas-speech-to-fedusa-jobs-jobs-and-again-jobs>

- Pather, S., & Gomez, R. (2010). Public access ICT: A South-South comparative analysis of libraries, telecentres and cybercafés in South Africa and Brazil. *AMCIS 2010* (pp. 1–11). Lima.
- Pearson, M., & Somekh, B. (2003). Concept-mapping as a research tool: A study of primary children's representations of information and communication technologies (ICT). *Education and Information Technologies, 8*, 5–22. doi:10.1023/A:1023970123406
- Pettersson, J. S. (2008). Proceedings of the 1st International Conference on M4D Mobile Communication Technology for Development (M4D 2008, General Tracks), 11–12 December, 2008, Karlstad University, Sweden. *M4D 2008 Proceedings*. Karlstad, Sweden: Centre for HumanIT, Karlstads universitet. Retrieved from <http://kau.diva-portal.org/smash/record.jsf?pid=diva2:133042>
- Prasad, R., & Ray, R. S. (2012). Telecentres go where mobile phones fear to tread: Evidence from India. In *Regional International Telecommunications Society India Conference* (pp. 1–26). New Delhi.
- Prinsloo, M., & Walton, M. (2000). Situated responses to the digital literacies of electronic communication in marginal school settings. In N. Pecora, E. Osei-Hwere, & U. Carlson (Eds.), *Yearbook 2008: African media, African children* (pp. 99–116). Göteborg, Sweden: Nordicom, Göteborgs Universitet.
- Reck, J., & Wood, B. (2004). Vodacom's community services phone shops. *Small Enterprise Development, 15*(4), 31–37. doi:10.3362/0957-1329.2004.046
- Samii, R. (2009). Mobile phones: The silver bullet to bridge the digital divide? *Participatory Learning and Action, 59*(1), 44–50. Retrieved from <http://www.ingentaconnect.com/content/iiedpla/pla/2009/00000059/00000001/art00007>
- Schoon, A. (2012). *Raw phones: The domestication of mobile phones amongst young adults in Hooggenoeg*. Masters Thesis, Rhodes University, Grahamstown, South Africa. Retrieved from <http://eprints.ru.ac.za/2894/>
- Seekings, J., & Natrass, N. (2006). *Class, race, and inequality in South Africa*. New Haven, CT: Yale University Press.
- Sey, A., & Fellows, M. (2009). Literature review on the impact of public access to information and communication technologies. Seattle, WA: University of Washington Center for Information & Society. Retrieved from <http://library.globalimpactstudy.org/sites/default/files/docs/CIS-WorkingPaperNo6.pdf>
- Sey, A., & Fellows, M. (2011). Loose strands: Searching for evidence of public access ICT impact on development. In *Proc. iConference 2011* (pp. 189–194). New York: ACM. Retrieved from <http://portal.acm.org/citation.cfm?id=1940787>
- Skuse, A., & Cousins, T. (2007). Managing distance: Rural poverty and the promise of communication in post-apartheid South Africa. *Journal of Asian and African Studies, 42*(2), 185–207. doi:10.1177/0021909607074867
- Skuse, A., & Cousins, T. (2008). Getting connected: The social dynamics of urban telecommunications access and use in Khayelitsha, Cape Town. *New Media & Society, 10*(1), 9–26. doi:10.1177/1461444807085319
- Slater, D., & Kwami, J. (2005). *Embeddedness and escape: Internet and mobile use as poverty reduction strategies in Ghana*. London: Information Society Research Group. Retrieved from <http://zunia.org/uploads/media/knowledge/internet.pdf>

- Smyth, T. N., Kumar, S., Medhi, I., & Toyama, K. (2010). Where there's a will there's a way. In *Proceedings of the 28th International Conference on Human Factors in Computing Systems - CHI '10* (p. 753). New York: ACM Press. doi:10.1145/1753326.1753436
- Statistics South Africa. (2011). *Quarterly labour force survey: Quarter 3 (July to September) 2011. Quarterly Labour Force Survey* (Vol. 70). Pretoria. Retrieved from <http://www.statssa.gov.za/publications/P0211/P02113rdQuarter2011.pdf>
- Stein, P., & Slonimsky, L. (2006). An eye on the text and an eye on the future: Multimodal literacy in three Johannesburg families. In K. Pahl & J. Roswell (Eds.), *Travel notes from the new literacy studies: Instances of practice* (pp. 118–146). Clevedon, UK: Multilingual Matters.
- Street, B. V. (1995). *Social literacies: Critical approaches to literacy in development, ethnography, and education*. New York: Longman.
- Street, B. V. (2001). Literacy “events” and literacy “practices”: Theory and practice in the “New Literacy Studies.” In K. Jones & M. Martin-Jones (Eds.), *Multilingual literacies: Comparative perspectives on research and practice*. Amsterdam: John Benjamins.
- Street, B. V. (Ed.). (1993). *Cross-cultural approaches to literacy*. Cambridge, UK: Cambridge University Press. doi:10.2307/330148
- Swartz, S. (2009). *Ikasi : The moral ecology of South Africa's township youth*. Johannesburg: Wits University Press.
- UNICEF. (2011). *From “Whats your ASLR” to “Do you wanna go private?”* (pp. 1–32). New York: UNICEF. Retrieved from http://www.unicef.org/southafrica/resources_9714.html
- Wallis, C. J. (2009). Marginal youth in virtual spaces: Rural-to-urban migrants and new communication technologies in Beijing. (Conference presentation at *AoIR 2009*, Milwaukee, WI). Retrieved from <http://ocs.sfu.ca/aoir/index.php/ir/10/paper/view/116>
- Walton, M. (2010). *Mobile literacies and South African Teens: Leisure reading, writing, and MXit chatting for teens in Langa and Gugulethu*. Cape Town: University of Cape Town. Retrieved from http://m4lit.files.wordpress.com/2010/03/m4lit_mobile_literacies_mwalton_20101.pdf
- Walton, M., & Donner, J. (2011). Read-write-erase: Mobile-mediated publics in South Africa's 2009 elections. In J. E. Katz (Ed.), *Mobile communication: Dimensions of social policy* (pp. 117–132). New Brunswick, NJ: Transaction Publishers.
- Walton, M., Marsden, G., Hassreiter, S., & Allen, S. (2012). Degrees of sharing: Proximate media sharing and messaging by young people in Khayelitsha. In *Proc. MobileHCI 2012*. New York: ACM Press.
- Walton, M., & Pallitt, N. (2012). “Grand Theft South Africa”: Games, literacy and inequality in consumer childhoods. *Language and Education*, 26(4), 347–361. doi:10.1080/09500782.2012.691516
- Wasserman, H. (2011). Mobile phones, popular media, and everyday African democracy: Transmissions and transgressions. *Popular Communication*, 9(2), 146–158. doi:10.1080/15405702.2011.562097
- World Wide Worx. (2011). *Mobility 2011: The mobile Internet in South Africa 2011 (executive summary)*. Johannesburg. Retrieved from <http://www.worldwideworx.com/wp-content/uploads/2011/02/Exec-Summary-The-Mobile-Internet-in-SA-2011.doc>

World Wide Worx. (2012). Mobile pushes Internet to the masses. Retrieved from <http://www.worldwideworx.com/mobile-pushes-internet-to-the-masses>

Yates, J., & Orlikowski, W. J. (1992). Genres of organizational communication: A structurational approach to studying communication and media. *Academy of Management Review*, 17(2), 299–326.