"Facebook is a Luxury": An Exploratory Study of Social Media Use in Rural Kenya

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ABSTRACT
Facebook use is pervasive in developed countries where computers, smartphones, high-bandwidth Internet, and electricity are ubiquitous. In this paper, we examine Facebook use in a country where social media participation is growing, but less developed technological infrastructures and uneven access to technology limit use. We conducted observations and 24 interviews at Internet cafés in rural Kenya. Our findings reveal how costs associated with using the Internet, limited access to computers and smartphones and unreliable electricity hinder online participation. We draw on these results to discuss the critical role of constraints in understanding social media use, to raise questions about broadening online participation and to highlight ethical issues researchers must consider when studying Facebook use in developing regions.

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Facebook, social media, social networking sites, Kenya, infrastructure, ICTD

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

You see, when you don't have technology it's like you are in your own world and people are in their other world… It's like traveling. When you travel you need to learn a lot, if you cannot travel it's also another way of learning a lot.

– Kenyan Interviewee, when asked why she wants to use Facebook

This quote captures the optimism implicit in narratives about communication technologies in the so-called developing world. The potential for Information and Communication Technologies (ICT) to support economic prosperity, education, and civic engagement in these countries has been widely discussed, however, despite their global reach and proliferation, research on social network site (SNS) use in such contexts is sparse. Consequently, we know little about how globally adopted sites such as Facebook are used in sub-Saharan Africa, where use is growing. What is the Facebook experience in contexts where the social, economic, and technical contexts affecting use differ from the American college campuses where the site was first popularized? To answer this question we conducted qualitative fieldwork in rural Kenya.

Our findings reveal how limited bandwidth, power outages and persistent poverty shape peoples' experiences with Facebook. These factors are typically taken for granted in sites where Facebook is usually studied (the U.S. and U.K.), but were at the forefront of users' experience on the site in rural Kenya. For example, the costs of creating and maintaining a Facebook account limited use of the site among our participants. Monetary costs associated with using the Internet are rarely discussed in prior Facebook research.

We use our findings to motivate practical suggestions for improving the Facebook experience in rural Kenya, to highlight the critical role of constraints in understanding SNS use, to raise questions about broadening online participation and to offer practical insights for future researchers wanting to study Facebook in the rural Africa. Broader implications of our work include contributing to a nascent body of work aimed at understanding SNS use outside of the U.S. and Europe. Facebook is a global site with 70% of it users living outside of the U.S. and research must account for this increasing diversity [33].

BACKGROUND AND RELATED WORK

Empirical Studies of Facebook Use

Facebook research tends to be conducted in North America and Europe where technology infrastructures are highly developed [33]. These populations were the earliest adopters of the site, the first to reach market penetration levels upwards of 50% and, as such, provided rich opportunities for understanding the roles that SNS play in people's academic, social, and work lives. Notable examples of this research include Ellison, Steinfield, and

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Lampe's studies of how American college students benefit from social connections on Facebook [12, 43] what kinds of connections are most useful [13], how SNS help young people transition to college, and explorations of how students use Facebook to support academic collaborations [26]. Privacy preferences and identity management have also been examined in American academic contexts, where college students negotiate multiple communities and social contexts [19, 29].

This research has contributed to the community's understanding of SNS use in valuable ways; however, these studies take place with college-educated populations living in the U.S. where Internet access is seemingly unlimited, unconstrained, and where users rarely consider the costs associated with accessing it. Growth of SNS use among these populations is plateauing and future growth for services such as Facebook, Twitter and Google+ is predicted in the developing world [22, 42]. Yet, little data exist on use of these services these regions, thus a limited set of use practices shapes scholars' understanding of an increasingly global phenomenon.

More problematic than the lack of cultural diversity in empirical accounts of Facebook use is the potential for assumptions about infrastructure, access, and market constraints to also remain unexamined. Lessig notes that social norms, laws, market forces, and architectural (both technological and physical) constraints all influence online behaviors in complex, interrelated ways [28]. Our research highlights how architecture (e.g., physical access and infrastructure) and market forces (e.g., cost and pricing structures) shape Facebook use in rural Kenya. We argue that these influences are rendered invisible if Facebook use is only studied in contexts where technological infrastructure and economies are robust.

Infrastructures and Internet Access in Kenya

An infrastructure is an underlying framework that enables a group, organization, or society to function in certain ways, such as the series of pipes, drains, and water sources that comprise a water system [27]. Our use of the term is more constrained and reflects other researchers' use of it to draw attention to taken-for-granted factors in infrastructure-rich countries (e.g., [48]).

Access to the Internet and latest ICT varies between rural and urban parts of the Kenya. In the country's capital, Nairobi, billboards advertise the latest smartphones, Apple products are available for purchase at Western style malls and Internet access is becoming increasingly ubiquitous, though slower than what many Western users are accustomed to. These and other benefits of the latest ICT are less visible in rural Kenya, where people live off electricity grids and often lack the steady income necessary to take full advantage of available technologies. In Kenya an estimated 67% of the population live outside of the country's major urban areas of Nairobi, Mombasa, and Kisumu—places where hard-wired internet first reached in 2009 [2].

Kenyans living far from theses areas tend to be older, less educated and less informed about the latest ICT compared to their urban counterparts [16]. The majority subsist on the equivalent of $1.50 to $2.00 a day and do without consistent access to water and electricity [21,39]. Despite these challenges, Facebook use is growing in Kenya and at the time of our study it was estimated that there were slightly more than 1 million Facebook users in the country. By 2012 that number was approaching 2 million (in a country of more than 40 million people) [42]. Media reports and findings from our fieldwork suggest this growth is taking place in urban, or infrastructure rich parts of Kenya and in rural, or infrastructure poor settings [22].

Social Networking Sites in the Developing World

Though examples of research examining SNS in the African continent are scarce, we are not the first to study this topic. Mäkinen and Kuira's findings demonstrate how social media acted as an alternative medium for citizen communication during the crisis following the 2007 Kenyan presidential election [30]. Their research speaks to the growing presence of Web 2.0 communication tools and services in the country. More recently, Bosch conducted qualitative studies of Facebook use among South African college students [6,7]. Her findings highlight the benefits of using Facebook in teaching and learning, particularly for the development of "educational micro-communities" at the University of Cape Town. We build on this work, but rather than focusing on crisis situations or college students, we studied Facebook use among people living in rural Kenya.

SETTING AND METHODS

This was a qualitative study and our decision to study Facebook in Internet cafés builds on both Burrell's [8] and Fair et al.'s fieldwork in urban Ghana [15]. For people who lack an Internet connection at their home or office, and are unable to afford an Internet-enabled mobile phone, cyber cafés provide an important service for getting online. This understanding, paired with popular reports in Kenyan newspapers touting the rising popularity of the site, suggested that cafés would be fruitful field sites [34].

Our findings draw from fieldwork that took place during June-August 2011. We conducted observations, read local newspapers (e.g., *Daily Nation* and *The Standard*), and interviewed 24 individuals (15 actively used Facebook and nine were not yet members). We moved between offline spaces—the most prominent being 14 cyber cafés located in rural and peri-urban sites in central and western Kenya—and online spaces. Online fieldwork included observations of participants' Facebook profiles.

When entering cafés we usually logged onto our Facebook accounts, engaged patrons in short conversations about their Internet use and conducted semi-structured interviews with customers using the computers and individuals who owned

or were employed at the sites. These key informants had completed high school and were more knowledgeable about ICT compared to their customers.

Common livelihood activities among participants who did not work at cyber cafés included farming, selling homemade products, and receiving remittances from family members living in Nairobi, Mombasa, and the U.S. Personal contacts developed within the Kenyan migrant community in the U.S. led us to the following field sites: Bungoma, Eldoret, Homa Bay, Oyugis, Tala and Machakos. Eldoret was the largest site visited and had a population of 193,839, while Tala was the smallest with a population of 4,734 [1]. We complemented these formal interviews with several in situ conversations with café patrons to gain additional insights into how Facebook was used in rural Kenya.

Interviews were conducted in English, digitally recorded, and began with general questions about participants' experiences with mobile phones, computers, and the Internet. Asking about Facebook was a standard part of our protocol and these questions focused on participants' familiarity with the site, reasons for joining (or not joining) and whether or not they accessed the site on a mobile phone or at a cyber café. Our protocol was flexible enough to allow participants freedom to discuss related topics they deemed important. Finally, because gender, age, and class affect how researchers are seen in the field, we briefly describe the background of the first author, who collected the data used in our analysis [9]. The first author is a 36-year old, American-born, English-speaking, middle-class, white woman, with prior research experience in Kenya.

Data Analysis

Our fieldwork resulted in 24 transcribed interviews, 174 pages of field notes and 1,375 digital photographs. The qualitative method used to analyze data was thematic analysis, wherein patterns emerged via repeated analytic passes through the transcripts and field notes [17]. After patterns were identified, the first author catalogued them into categories that addressed the following question, "What factors affect using Facebook in rural Kenya?" After she analyzed the transcripts and drew tentative conclusions, they were discussed with the co-authors who are experts in SNS and uses of sites like Facebook. Their feedback was incorporated into the analysis. Once this was completed, the authors reread the related literature and formulated themes presented as findings in this paper.

FINDINGS: ALTERNATIVE UNDERSTANDING OF USE

Everyone interviewed was familiar with Facebook, more than half of our participants actively used the site, and those who were not yet members wanted to be. Yet the costs associated with creating and maintaining an online profile prevented them from joining the site. For low-income rural Kenyans accessing the Internet at a cyber café or on an Internet enabled mobile phone represented a significant expenditure [39].

Buying a mobile phone is an expense and so is using it to access the Internet. Most Kenyans and all of our participants use pre-paid "airtime" or "credit" plans. Credit typically comes in the form of scratch-cards that are sold in units ranging from (Kenyan Shilling) KSh 10 ($0.10) to KSh 1000, or approximately $10.00. Even those with the financial resources to use the Internet encountered challenges when using Facebook, including: frequent power outages, limited Internet access and low-bandwidth. Poverty also shaped these participants use of the site; specifically, some wanted to make online friends abroad in hopes they could use them to gain financial resources.

A Desire to use Facebook

In North America and Europe, people regularly use Facebook to reconnect with friends, update their status, and send private messages. Some rural Kenyans described similar patterns of use; for example, a young man who owned a café emphasized that Facebook was the "most popular" site in Kenya and that many patrons came to his café to "chat" with friends. He added that he accessed the site four to five times a day and valued being able to share information with his online friends.

And you can use it blog, you can also tell some…something about yourself or what you are doing, then many people access it, yeah. And the chain of friendship so the information goes to many people, because your friend is a friend to some other people.

Alex, like the other eight cyber café employees interviewed, used Facebook in ways that resembled documented practices in countries with developed technological infrastructures. Our interviews and conversations with individuals living outside of the towns where the cyber cafés were located revealed alternative practices.

Participants not using Facebook

Everyone interviewed was familiar with Facebook; however, the 10 participants living in rural communities outside of the towns where the cyber cafés were located were unclear about the purpose of the site. These areas were located off electricity grids, lacked access to water, and the roads linking them to cities were poorly maintained [4, 21]. People we talked to in Kamuu, Kakichuma, Ziwa, and Sawich villages learned about Facebook from friends living in urban Kenya, in North American and in European countries, or by watching people access the site on their mobile phones. Knowledge about Facebook also came from unexpected places, such as Kenya's transportation industry. There were references to the SNS on *matatus*, a public service mini-van used by a low and middle-income Kenyans (Figure 1). This sighting also suggests that Facebook is on par with other symbolic objects depicted on matatus such as Brazilian World Cup players and U.S. pop and rap stars. Despite an awareness of Facebook, these participants had never used the site and told us they "didn't know much about it," "did not know how to use it effectively" or lacked technological "know-how."

Hard-wired Internet reached rural parts of Kenya in 2009 [16,41], so it is unsurprising that some participants had not yet accessed Facebook and referred to it as a "new thing." Yet their familiarity with and desire to learn more about Facebook reveals how the idea of online social networks has reached those most affected by the digital divide, even if the infrastructures to support it has not kept pace. After explaining, and sometimes using our personal modem and laptop to show these individuals the Facebook site, we asked them to consider whether or not they would want to join the site. Their replies were revealing:

Yes, you could be updated and understand what is going on in the world. . .you get on Facebook, you feel advanced, you have friends, you can send them snaps and they can exchange.

Mobile phones make it cheaper and faster for people to communicate with people in regions where infrastructures to support fixed-lines phones are underdeveloped; researchers suggest this is a primary reason the device has been overwhelmingly successful in the African continent [14,44]. Facebook offers people additional ways to sustain relationships by sharing "snaps," or photos. This participants' use of the term "advanced" reveals, like others interviewed, the status that is tied to using the Internet and having a Facebook account. Indeed, this is another reason the site has become a symbol emblazoned on public transportation. Like having a mobile phone, it appeared that having a Facebook account was perceived as a status symbol and this may explain our participants' strong desire to be a part of this online community [25]. Other reasons include wanting to "understand what is going on in the world" and for this particular participant, to see photos of her nephew living in the U.S.

Facebook Costs in Rural Kenya

Participants living in the rural communities we visited consistently told us costs associated with creating and maintaining a Facebook account prevented them from joining. These remarks were surprising to a Western observer who regarded the site as free of charge, with a business model that relies on advertising rather than subscription [38]. Further questioning revealed how establishing an account could become an expense for individuals earning the equivalent of $1.50 a day. We asked café managers, who routinely created accounts for people coming to town from rural villages, about this process and learned there was a cost associated with every phase of the sign-up process.

Figure 1: Matatu with Facebook insignia.

For some people, joining Facebook required them to obtain an email address or in a few cases to "activate" an address that had expired due to lack of use. Four participants had not checked their Yahoo! accounts for two and three years and consequently they became inactive. When helping customers re-activate or create email accounts, café workers encouraged clients to use numbers they would not forget such as their mobile phone or government identification numbers as passwords. At some cafés, creating an email account was a service with a fixed price (10 KSh or $0.11), but it was more common for customers to pay for using the Internet at the café, where costs were typically (0.50 to 2 KSh/minute).

Creating, scanning, and uploading a profile picture to a new account resulted in additional costs. Digital cameras are too costly for most rural Kenyan consumers. Although mobile phones with cameras are available, our participants told us photos taken with a mobile phone were lower quality than those taken with a digital camera. Instead, they wanted a "presentable" or "smart" profile picture and understood that a picture taken with digital camera was higher quality than one taken with a mobile phone.

Rural Kenyan towns are dotted with small photo shops painted yellow and displaying the Kodak Film logo. People visit them to have photographs taken that eventually become their profile pictures. Theses paper photos have to be scanned and uploaded to Facebook, resulting in additional costs. An employee at a cyber café in Homa Bay explained this process:

It is common knowledge like if you want to be on Facebook you must have a photo, when they come, they come armed with that photo, you have to scan and upload it for them and they get excited and you see like scanning one photo is thirty shillings, thirty Kenyan shillings. Uploading is ten shillings. . .

Once an account was established there were further costs associated with maintaining it. All participant lacked domestics Internet access, so in order to use Facebook they had to travel to town from a rural village typically by paying for a ride on a bicycle, motorcycle, or matatu. Paying for each minute online at the cyber café was another expense, as was the return trip home. Prices that might seem like small amounts to Western observers represented significant expenditures for participants relative to their other daily expenses. The cost of using the Internet at a café for 30 minutes typically cost 0.50 KSh ($0.60), which is

roughly the price of buying enough maize porridge to feed a family for a few days.

Those who chose to access the site told us using Facebook was a "luxury." One participant allowed himself to log-on after "finishing other expenses," and others said they would access the site if they had extra "bob," a slang term for the Kenyan schilling. Their desire to use Facebook despite coping with acute economic constraints speaks to participants' desire to be a part of what they called a "global village." Continuing to explore Facebook use in settings where costs limit use can be useful for understanding what features are most valued on the site. For our participants it was clearly the ability to "chat" with friends.

Mobile Phones and Costs

Given the widespread adoption of mobile phones throughout Kenya and sub-Saharan Africa, it was unsurprising to learn that participants accessed Facebook on these devices. We encountered six people with Internet enabled phones. They were all men, worked at the cafés we visited, and used their phones to "see what their friends were doing" or to "update their status" on Facebook. Costs impacted their experience on the mobile version of the site because like accessing Facebook at cyber cafés, participants paid to use the site on their mobile phones. Lack of electricity meant they were also paying to charge the batteries in their mobiles devices.

Small kiosks selling scratch-cards are a ubiquitous part of the landscape in rural Kenya; yet even so, lack of credit consistently affected participants' ability to access the mobile Internet. To get a sense for how much credit people generally carried, we asked them how much airtime was on their mobile devices. Amounts ranged from KSh 0 to 112 ($0 to $1.18), with the average being KSh 21 among the 24 people asked. This means at any given they could browse the Internet on their phones for approximately for 6-12 minutes (depending on the current rates of their service provider).

Underlying the practical use of mobile phone applications are assumptions about users' abilities to maintain a charged phone battery. But like most people living in rural Africa, our participants lacked access to electricity and maintaining a charged battery in their mobile handsets was difficult. A desire to "preserve the charge" on their phones limited how long respondents browsed the Internet [47]. A dead battery required taking the phone to a charging kiosk and paying 20 KSh for it to be recharged. These participants understood that accessing the Internet depleted battery life faster than using their phones to make calls and they adjusted their usage accordingly, meaning they typically spent two or three minutes looking at the mobile version of Facebook. The cost of purchasing a smartphone, or any kind of high-end device that can access the Internet, was out of reach for the majority of our participants, thus accessing the site on a desktop computer in a cyber café was more common than using it on a mobile phone.

At the time of our study the lowest cost 3G-enabled Nokia was approximately $150, while a simple handset cost the equivalent of $20. These latter phones typically have small black and white screens (unlike the larger, colored screens on popular smart phones like the iPhone or Droid), have little memory and are not Wireless Application Protocol (WAP) enabled.

USSD Version of Facebook

In response to the ubiquity of these basic phones in rural Kenya, Safaricom, Orange, and Yu—Kenya's leading mobile network operators—recently introduced an USSD version of the site called *Facebook Zero*. USSD (Unstructured Supplementary Service Data) is a protocol common to all GSM (Global System for Mobile Communications) phones. It enables services such as exchanging money via M-Pesa, the popular mobile phone based money transfer service, is accessible by dialing a number, and works on almost all mobile phones. Thus, users with older or very basic handsets without an Internet connection can access a site like Facebook. To use Facebook on these simple phones, users enter a specific code and then enter a PIN number to access the service [3,5]. The USSD version of Facebook is entirely text-based and does not support the site's most popular features, including the News Feed and photosharing [5]. We saw advertisements for this version of the site in mobile phone stores (Figure 2), but none of our participants used it. We speculate this may be because of the novelty of the service; at the time of our fieldwork it had been available for less than one year [44].

Limited Bandwidth and Power Outages

A typical Internet café was located in a small, dimly lit, and minimally decorated room containing 6-12 secondhand computers on wooden desks. The Hewlett Packard, Compaq, and Dell machines in them were bulky and showed considerable wear. Keys were missing from keyboards, dated monitors were sometimes blurry and the images on them shaky. The age of computers and limited bandwidth resulted in Facebook and other sites taking minutes rather than seconds to load. Profile pictures often remained gray before appearing and participants described waiting as "frustrating," because the delay cost money since they were paying for access by the minute.

Despite slow Internet speeds and dated equipment, we watched patrons scrolling through Facebook, engaging in chat sessions, and clicking on links at cyber cafés. Experienced Internet users developed strategies to use Facebook as efficiently as possible. For example, café employees with access to their workplaces after operating hours waited until the evening to use Facebook and other sites, including YouTube and Skype. This decision was related to their understanding that if fewer people were using the network it will be faster. They were also chatting

with friends overseas in different time zones. Another strategy participants used to make the most of their time was to simultaneously browse multiple webpages, for example:

When the Internet is a bit slow, I will open two tabs and while Yahoo! loads I am on Facebook browsing, getting updates, and then checking my mails again.

Findings from Wyche et al.'s study of Internet use in urban Kenya suggests that software developers create low bandwidth versions of their sites to account for the slow Internet speeds in the country [48]. In 2009, Facebook introduced a "lite" version optimized for users with slower or intermittent Internet connections. *Facebook Lite* offered fewer services, excluded most third-party applications, and required less bandwidth [45]. We experienced and observed performance lags on the site, which indeed suggests a low-bandwidth version as a technical response; however, before implementing such a response, companies should investigate whether or not rural users *want* an alternative version of the site and, if so, what features are desired. We observed rural users developing ingenious ways to navigate slow Internet speeds and limited bandwidth, they were resourceful and figured out how to make ICT work for them in their contexts. Perhaps this explains why Facebook shut down Facebook Lite seven months after introducing it [40].

Power Outages and Interrupted Use

The quality of the Kenyan electricity grid is poor and power outages or "blackouts" are frequent. During our fieldwork, the country experienced particularly aggravating power outages attributed to natural (e.g., storms) and man-made (e.g., vandalism and overuse) events [35]. Frequent blackouts had implications for cyber cafés, the most dire being that the cafés had to close. When touring towns and entering cafés we found dark rooms and unlit monitors on more than one occasion. Café employees rarely knew when power would return. While interviewing a staff member at a café in Bungoma we experienced four blackouts during a six-hour period, each lasting between 10-45 minutes. In Tala, a café owner showed us old monitors, scanners, and desktop computers that had been "spoiled" due to power outages and corresponding surges.

Blackouts also had implications for customers using Facebook, because it meant they were unable to log off of their accounts. When logging onto our personal account, finding an open one on the shared computer was common. There were consequences of being unable to log off of Facebook. For example, Micheal, a 25-year-old, originally from a village outside of Machakos told us after experiencing a power outage, he logged onto his account three days later and found someone had updated his status to indicate he had come out as gay. A young woman, who unintentionally remained logged onto the site following a power outage, found that someone changed her status to say that she had multiple sexual partners. Unsurprisingly, she and others interviewed found these posts upsetting and worked to counter them with clarifications when they next logged onto Facebook. This required spending more time and money at the cyber café.

Power outages coupled with shared ICT affect Facebook use in Kenya. Compared to findings in prior studies, this creates an alternative depiction of people's experience with the site. Problems with power will persist in Kenya, and backup power sources are too costly for many cyber café owners. This suggests opportunities to develop versions of the site that automatically log users off after a certain amount of time or developing an "auto log off" feature. Such straightforward responses to this problem would likely limit concerns and embarrassment that result from an undesirable message being posted on one's wall.

Low-cost Communication, Poverty Reduction Strategies and Friending

In addition to preventing some participants from creating accounts and limiting the amount of time spent online, there were other ways lack of financial resources affected respondents' interactions on Facebook. Though all participants expressed concerns about power outages and costs of using the Internet, for most, the desire to connect was powerful enough to keep them coming back to the site. Here we describe two ways costs affected how our participants used Facebook to maintain and create ties with people abroad. First, because Facebook was less expensive than making overseas phone calls, participants used it to communicate with friends and family living outside of Kenya. Second, participants' wanted to expand their online networks to include people who they perceive to have more financial resources than they do.

Participants had family and friends in other countries, across Europe and North America, and in other parts of the African continent. Over the last two decades, economic difficulties, increased poverty, and political instability have resulted in large-scale migration of Africans to the U.S., including many Kenyans [24]. Thus, it was common for

Figure 2: Sign advertising USSD version of Facebook at Safaricom store in Bungoma, Kenya.

participants to have friends and family living around the world. Participants showed us the online profiles of friends who migrated to California, Michigan, New Jersey, Virginia and countries including Canada, Germany, U.K., and Malta.

Those with family abroad were accustomed to being at the receiving end of transnational communication because it was more economical for people overseas to pay for an international phone call to Kenya. However, Facebook allowed our participants to initiate contact with people overseas [48]. "Flashing" or "beeping" are commonly used to initiate phone calls with friends and family abroad. [11,46]. This process involves a person calling a mobile telephone number and then hanging up before the mobile phone's owner can pick up the call. It is a free way to alert someone that you would like him or her to call you [10]. Facebook provided participants with an alternative way to initiate conversations with friends abroad because it cost less than making an overseas phone call. *Facebook Chat* is an instant message function incorporated into the site that makes it easier to find online friends available to chat. Unlike other chat applications, such as *Skype* or *AOL Instant Messenger*, Facebook chat does not require users to download new software, making it a desirable chat option in cyber cafés where limited bandwidth complicates software downloading. A young man explained the cost and benefits of using Facebook chat when telling us about communicating with a childhood friend living California:

If I communicate with him on the phone, I spend ten shillings per minute, so if you talk for 30 minutes that is 300. But on Facebook I can chat for 30 minutes, share loads, at a lower rate.

Facebook chat alters the historically unidirectional flow of transnational communication. Those who regularly used the feature told us they preferred chatting with online friends in a real-time rather than using email. We observed café patrons exchanging short messages often using a combination of English, Swahili, and their vernacular language. Like the strategies users developed to maximize their Internet use, our participants adoption of Facebook as a low-cost way to communicate with people abroad also speaks to how they make ICT fit into their everyday lives.

The second way cost influenced participants' SNS use became evident in some of their explanations of why they would want an American friend. Facebook offers the possibility of what has come to be known as "friending." As in other social network sites, users create profiles that may contain photos and other personal information as well as a list of connections to others' profiles. Making those connections, or "Friending," on Facebook is reciprocal; a request to become a 'friend' must be accepted before the connection is recognized in the system. During our observations at cafés, patrons frequently asked to see the first author's Facebook profile and requested to add her as a friend. People add friends for a variety of reasons [18], so we probed to understand why they wanted to add her as a friend. Responses were often tied to her race and being an American. For example, a young man working at a cyber café in Homa Bay made the following comment:

I like to be connected with people in America.

A young woman in Tala told her:

I have always loved to have a white as a friend on Facebook.

Most individuals wanted foreign contacts for their own sake, but others saw a connection between having an American friend on Facebook as fulfilling other aspirations. Life in rural Kenya is unpredictable so a connection to someone perceived as a rich foreigner acted as sort of insurance policy against future hardships [15]. Our understanding of this became clear once the author returned to the U.S. and received requests for money and other forms of aid from the individuals she friended. Below is an excerpt from one of these messages:

My plea is that you kindly assist me to offset the balance I owe the university of 60,000 KSh = 637.80 USD, this will enable me have my certificates and a better chance to get employed. . .

This phenomenon is not new and anthropologists and aid workers have written about the complications that can arise when they become intertwined with peoples' income generating strategies (e.g., [37]). In the past, people sent letters asking for money, goods, and assistance with obtaining a visa to the U.S.; today, Facebook provides a more immediate way to make these connections. This example serves a reminder that, although there is much enthusiasm for the ways technology can potentially bring about social change, it can also perpetuate both perceptions and realities of long-standing inequality between developed and developing countries. Such assumptions serve an important function in ethnographically informed research and merit more attention as CSCW researchers explore ICT appropriation in developing countries.

SUMMARY AND DISCUSSION

Our findings present an alternative understanding of Facebook use with constraints that differ from those implicit in common narratives about Facebook on college campuses and other infrastructure-rich contexts. The constraints we identified include:

- **local market constraints**, which include not only the cost of obtaining hardware, an internet connection, and bandwidth, but also emergent local markets around the production and consumption of media like digital images to share on social network sites;
- **infrastructure constraints**, such as low bandwidth and slow internet connections and unpredictable electrical and communication grids; and

- **the demands of persistent poverty**, which created incentives for overcoming barriers to use, including relatively low-cost mechanisms for keeping in touch with distant loved ones and the hope of establishing social ties that may help secure economic or social stability.

In contrast to prior studies of Facebook, the marketplace and technical infrastructures are at the forefront of participants' experiences with social media, rather than removed from users' concerns.

The Critical Role of Constraints

Our findings reveal constraints that affect social network site use in rural Kenya that, to our knowledge, have not been reported elsewhere in the literature. This raises questions about the applicability of findings regarding Facebook use in more studied settings (e.g., U.S. and U.K.) to rural Africa and even in North America where uneven Internet access and limited electricity also influence peoples' online experience [31]. For example, prior research suggests that users primarily use Facebook as a way of passing time [36]. These findings are drawn from a survey of students at an American university where infrastructure and cost are largely invisible and taken for granted. In rural Kenya, Facebook use is tightly coupled with economic resources: 30 minutes at an Internet café (KSh $0.50 or $0.60) could easily consume about one third of a person's daily expenditures in rural Kenya. This raises questions about whether findings about passing time as a motivation can possibly be used to understand Facebook use in rural Kenya.

Future research on motivation and priorities in Kenya, where costs and limited access are a factor, could lead to a better understanding of what needs are met by social media and how. This work can also help designers understand what features are most valued among different populations and also where concerns should be raised. In America, Facebook and privacy is an ongoing issue for academics and society at large. In rural Kenya, where every minute on Facebook can represent real costs to a user, do questions about privacy preservation and settings become even more pressing?

We also offer preliminary insights into how friending practices intersect with economic concerns. Participants described and exhibited friending behavior predicated on desired economic and social mobility and security. What is the value of Facebook friends for these individuals? This question has been answered in the context of the American college campuses. For students who exhibit low self-esteem, Facebook use is correlated with higher levels of self esteem and social capital [14]. Can we assume these benefits of Facebook friends carry over into non-Western contexts, where friending is motivated by different needs and where online attention is a more limited commodity? The relative inability of Kenyans to access and browse Facebook for great lengths of time and the varied incentives to participate in Facebook challenge current understandings of how and why people use SNS.

The Benefits and Threats of Broadening Participation

Participants' persistent desire to use Facebook despite obstacles suggests that, although their experience does not mimic those of college students in the U.S., they do perceive social and economic benefits of using the site. If we accept this perception uncritically, that access to Facebook is desired and beneficial for users, we might anticipate that easier and cheaper access would result in more equitable benefits for rural Kenyan users. Some solutions to the question of equity are being explored; for instance, Facebook is collaborating with mobile operators to make *0.facebook.com* accessible to people without data charges [44]. Though it was a feasible option and some interviewees described using their phones to access Facebook, we concluded it was not yet a main attraction. For most the phone remains a device reserved for making short phone calls and exchanging money using M-Pesa rather than a tool to support social networking. It will take time to for users to consider and embrace different ways they can use mobile devices.

A more critical interpretation of broadening participation on Facebook highlights potential threats and vulnerabilities. The company's business model relies on users trading access to a wealth of personal information and data about their behavior for the experience of connecting with others and sharing content. If, as we have suggested, Kenyan users view the site as an economic way of contacting loved ones or as a safeguard against economic hardship, this places them in a vulnerable position. Specifically, it may be hard for them to refuse to use the service or put pressure on Facebook to amend business practices if they feel their social life and livelihood depend on it. When the cost of opting out is too great, users may compromise other areas of their life (in both Western and non-Western contexts).

Finally, this work serves as a reminder that the experience of a service being free is not possible until larger problems such as rural electrification are remedied. Businesses that rely on that experience can help engineer ways of providing access. Facebook could explore mechanisms aimed at shifting the costs of using the site away from café patrons so they can enjoy the using the site in ways taken for granted by North American and European users.

Since large-scale formal rural electrification is unlikely to extend to remote locations, like some of those we visited, other alternative power sources like wind, diesel, human-or animal-draft power, and solar photovoltaic will be needed [21]. Until then, something as simple as the cost of charging one's phone will hinder the use the mobile phone as a web-browsing platform.

A Note on Future Research

This study is our first step in studying SNS use in rural Africa. Continuing to study Facebook in infrastructure poor

settings in North American and abroad is critical. As such, we offer advice and reflections for scholars who wish to conduct future research examining SNS developing countries. These recommendations are based on our experiences and also reflect lessons learned as we continue to conduct research in this space.

Participant compensation. Online surveys are commonly used in prior work examining Facebook use (e.g., [23]). For this approach to data collection to be successful in contexts like we studied, researchers should compensate participants for time spent at cyber cafés and for accessing the Internet on their mobile phones.

Increasing interview comprehension. For this study, we conducted our interviews in English. The first author has experience with both native-language interviews with an interpreter and English language interviews with ESL speakers. We believe that working closely with local interpreters and people familiar with the various tribal languages spoken in Kenya would lead to a deeper understanding of their online experiences.

Research questions. Participants' stories raised questions such as, "How is Facebook a platform for social expression among rural Kenyans?" and "How is it used to circulate rumors and gossip?" "What social and cultural norms in rural Kenya govern self-presentation online?" In part because nuance is lost in second-language interviews, and in part because we did not pursue these lines of inquiry, we have less traction to answer these questions and they remain interesting areas for future research.

Ethics and awareness. As more researchers explore social media outside of Western academic institutions, new ethical challenges will likely arise and researchers should be sensitive to these. Like others, we believe the challenge is for researchers to add value to the lives of people they are researching, to recognize them as participants and not simply sources of data [20]. Of course, these challenges have been discussed in other disciplines (e.g., Anthropology) and we see an opportunity to increase awareness of them as CSCW researchers examine SNS's in new contexts.

LIMITATIONS AND CONCLUSION

Our study was ethnographic in nature and aimed to study a small sample of users. Hence, our findings are representative of trends and patterns of behavior associated with a particular set of participants and experiences. The complexities surrounding race, gender, colonialism, and constraints including financial, technical, and infrastructural ones cannot be fully represented in an exploratory study like ours. Instead our research provides the CSCW community with a first step in understanding Facebook use in rural Kenya and highlights opportunities for future research.

We present, to our knowledge, one of the first studies of SNS use in rural and peri-urban Kenya. We conclude that by continuing to conduct research focused mainly on the U.S. we risk making global assumptions about SNS use based on local Western uses. Our study reveals that these assumptions can be impoverished and in some cases wrong. The danger here, of course, is that if we assume use in developed countries is universal, we will gloss over challenges and deeper understanding of what it means to use Facebook to connect with people in other parts of the world.

Thus it is necessary to understand SNS use in new contexts without assuming practices will necessarily mirror results from other regions of the world. As a first step in understanding how Facebook use differs between rural Kenya and more studied contexts, we showed how market forces, including cost and income, and architecture, including infrastructure, access, and electricity, affect peoples' experience on the popular social networking site. This paper underscores the need to understand technology use not only in different contexts, but with analytic approaches that help render important influences visible and point out where our data are insufficient. We see opportunities for further data collection and analysis to help us understand the social and legal aspects of Kenyan culture that may be playing a role in shaping behaviors.

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REFERENCES

1. Population of Local Authorities (with towns), Government of Kenya, 1999. Available online: http://treasury.go.ke/cbs.go.ke/pdf/authority.pdf.
2. World urbanization prospects: The 2009 revision. United Nations, Department of Economic and Social Affairs, Population Division, New York, 2010.
3. Africa, IT News. "Orange enables Facebook on non-internet phones," 2012. Available Online: http://www.itnewsafrica.com/2012/02/orange-enables-facebook-on-non-internet-phones/
4. Agesa, R.U. and Kim, S., "Rural to urban migration as a household decision: Evidence from Kenya," *Review of Development Economics* 5, 1 (2001), 60-75.
5. BizTechAfrica. "Facebook for every phone on Orange," 2012. Available online: http://www.biztechafrica.com/article/facebook-every-phone-orange/2029/.
6. Bosch, T.E., "Using online social networking for teaching and learning: Facebook use at the University of Cape Town," *Communication* 35, 2 (2009), 185-200.

7. Bosch, T.E., "Young women and 'technologies of the self': Social networking and sexualities," Agenda 25, 4 (2011), 75-86.
8. Burrell, J., "User Agency in the Middle Range: Rumors and the Reinvention of the Internet in Accra, Ghana," Science, Technology, & Human Values 36, 2 (2011), 139-159.
9. Davies, C.A., *Reflexive Ethnography: A Guide to Researching Selves and Others*. Routledge, London, 2002.
10. Donner, J., "The rules of beeping: Exchanging messages using missed calls on mobile phones in sub-saharan Africa," Paper presented at the 55th Annual Conference of the International Communication Association: Questioning the Dialogue, New York. (2005).
11. Donner, J., "The rules of beeping: Exchanging messages via intentional "missed calls" on mobile phones," *Journal of Computer-Mediated Communication* 13, 1 (2008), 1-22.
12. Ellison, N., Steinfield, C. and Lampe, C., "The benefits of Facebook 'friends': Exploring the relationship between college students' use of online social networks and social capital," *Journal of Computer-Mediated Communication* 12, 3 (2007).
13. Ellison, N.B., Steinfield, C. and Lampe, C., "Connection Strategies: Social Capital Implications of Facebook-enabled Communication Practices," *New Media & Society* (2011).
14. Etzo, S. and Collender, G., "The Mobile Phone 'Revolution' in Africa: Rhetoric or Reality?," *African Affairs* 109, 437 (2010), 659-668.
15. Fair, J.E., Tully, M., Ekdale, B. and Asanta, R.K.B., "Crafting Lifestyles In Urban Africa: Young Ghanaians In the World of Online Friendship " *Africa Today* 55, 4 (2009), 29-49.
16. Freeman, H.A., Ellis, F. and Allison, A., "Livelihoods and Rural Poverty Reduction in Kenya," *Development Policy Review* 22, 2 (2004), 147-171.
17. Glaser, B.G. and Strauss, A., *The discovery of grounded theory: strategies for qualitative research*. Rutgers University Press, New Jersey, 2009, 1967.
18. Golder, S., Wilkinson, D. and Huberman, B. "Rhythms of social interaction: Messaging within a massive online network." Steinfield, C., Pentland, B., Ackerman, M. and Contractor, N. (eds.), Proceedings of Third International Conference on Communities and Technologies, Springer, 2007.
19. Hewitt, A. and Forte, A., "Crossing boundaries: Identity management and student/faculty relationships on the Facebook," Extended Abstracts of CSCW'06, ACM, 2006, poster.
20. Hugman, R., "Social Work Research and Ethics," in Shaw, K., Briar-Lawson, J., Orme, J. and Ruckdeschel. (eds.), *The Sage Handbook of Social Work Research, Sage Publications*, Los Angeles/London, 2010, 149-163.
21. Jacobson, A., "Connective Power: Solar Electrification and Social Change in Kenya," *World Development* 35, 1 (2007), 144-162.
22. Jidenman, N. "Facebook's explosive growth in Africa Next Web Africa," 2011. Available online: http://thenextweb.com/africa/2011/05/02/facebooks-explosive-growth-in-africa/.
23. Joinson, A.N. 'Looking at', 'Looking up' or 'Keeping up with' People? Motives and Uses of Facebook Proc. of CHI'08, ACM, 2008, 1027-1036.
24. Konado-Agyeman, K., Takyi, B.K. and Arthur, J.A. (eds.), *The new African diaspora in North America: trends, community building, and adaptation*. Lexington Books, Latham, MD, 2006.
25. Kwaku Kyem, P.A. and LeMarie, P.K., "Transforming Recent Gains in the Digital Divide into Digital Opportunities: Africa and the Boom in Mobile Phone Subscription," *The Electronic Journal of Information Systems in Developing Countries* 28 (2006).
26. Lampe, C., Wohn, D., Vitak, J., Ellison, N. and Wash, R., "Student use of Facebook for organizing collaborative classroom activities," *International Journal of Computer-Supported Collaborative Learning* 6, 3 (2011), 329-347.
27. Lee, C., Dourish, P. and Mark, G. "The Human Infrastructure of Cyberinfrastructure," Proc. of CSCW'06, ACM, 2006, 483-492.
28. Lessig, L., *Code 2.0.* Basic Books, New York, 2006.
29. Lewis, K., Kaufman, J. and Christakis, N., "The Taste for Privacy: An Analysis of College Student Privacy Settings in an Online Social Network," J*ournal of Computer-Mediated Communication* 14 (2008), 79-100.
30. Mäkinen, M. and Kuira, M.W., "Social Media and Postelection Crisis in Kenya," *International Journal of Press/Politics* 13, 3 (2008), 328-335.
31. Melvin, R.M. and Bunt, A. "Designed for Work, But Not From Here: Rural and Remote Perspectives on Networked Technology," In Proc. of DIS 2012, ACM, 2012, 176-185.
32. Millen, D.R., "Rapid ethnography: time deepening strategies for HCI field research," Proc. of DIS '00, ACM, 2000, 280-286.
33. Miller, D., *Tales from Facebook*. Polity Press, Cambridge, U.K., 2011.
34. Mwaniki, P. "Facebook event draws crowd in Kenyan capital," *Daily Nation*, Nairobi, 2010.

35. Njoki, C. Govt blames fuel shortage on power outage, KBC News, 2011. Available online: http://www.kbc.co.ke/news.asp?nid=70049.

36. Papacharissi, Z. and Mendelson, A., "Toward a New(er) Sociability: Uses, Gratifications and Social Capital on Facebook. ," in Papathanassopoulos, S. (ed.) *Media Perspectives for the 21st Century*, Routledge, New York, 2011.

37. Pink, S., "The White 'Helpers': Anthropologists, Development Workers and Local Imaginations," *Anthropology Today* 14, 6 (1998), 9-14.

38. Postman, J. "Facebook Free? Hardly," *socialmediatoday.com*, 2011. Available online. http://socialmediatoday.com/socialized/362352/facebook-free-hardly

39. Sahn, D.E. and Stifel, D.C., "Urban–Rural Inequality in Living Standards in Africa," *Journal of African Economies* 12, 4 (2003), 564-597.

40. Scheils, M. "Facebook shut its Lite site after just seven months" BBC News, 2010. Available online: http://news.bbc.co.uk/2/hi/8623710.stm.

41. Shrum, W., Mbatia, P.N., Palackal, A., Dzorbo, D.-B.S., Duque, R.B. and Ynalvez, M.A., "Mobile phones and core network growth in Kenya: Strengthening weak ties," *Social Science Research* 40 (2011), 613-625.

42. socialbakers.com. "The rise of Asia and Africa on Facebook, statistics by continent!," 2011. Available online: http://www.kbc.co.ke/news.asp?nid=70049.

43. Steinfield, C., Ellison, N. and Lampe, C., "Social Capital, self-esteem, and use of online social network sites: A longitudinal analysis," Journal of Applied Developmental Psychology 29 (2008), 434-445.

44. Wasserman, H., "Mobile Phones, Popular Media, and Everyday African Democracy: Transmissions and Transgressions," Popular Communication 9, 146-158 (2011).

45. Williams, C. Facebook slims down for developing countries, *The Register*, 2009. Available online: http://www.theregister.co.uk/2009/08/12/facebook_lite/.

46. Wyche, S.P. and Grinter, R.E. "This is how we do it in my country": A Study of Computer-Mediated Family Communication Among Kenyan Migrants in the United States." Proc. of CSCW'12, ACM, 2012, 87-96.

47. Wyche, S.P. and Murphy, L.L. "Dead China-Make'' Phones Off the Grid: Investigating and Designing for Mobile Phone Use in Rural Africa," Proc. of DIS'12, 2012, ACM, 186-195.

48. Wyche, S.P., Smyth, T.N., Chetty, M., Aoki, P.M. and Grinter, R.E. "Deliberate interactions: characterizing technology use in Nairobi, Kenya," Proc. of CHI'10, ACM, 2010, 2593-2602.