

Zero-rating in emerging mobile markets: Free Basics and Wikipedia Zero in Ghana

Genevieve Gebhart
University of Washington
Information School
Seattle, WA 98103
gennie@uw.edu

ABSTRACT

Despite widespread controversy surrounding zero-rating—that is, the practice of subsidizing mobile data—the field suffers from a lack of inquiry into user understanding of and experience with zero-rated services. This paper explores how Ghanaian mobile users interact with zero-rated mobile applications Free Basics and Wikipedia Zero. Based on semi-structured interviews with users and non-users of the applications, I discuss how mobile phone users perceive Free Basics and Wikipedia Zero, what motivates them to use or not use the applications, and how the availability of the applications influences their data-buying strategies. Findings suggest that respondents, including those who did not actively use the applications, understood and experienced Free Basics and Wikipedia Zero in ways divergent from the providers' aim of expanding access to online content and services.

CCS Concepts

• **Human-centered computing ~ Ubiquitous and mobile devices ~ Mobile phones**, • **Human-centered computing ~ Empirical studies in ubiquitous and mobile computing**

General Terms

Human Factors

Keywords

Zero-rating; Free Basics; Wikipedia Zero; Network neutrality; Ghana; Non-users; Mobile data; ICTD.

1. INTRODUCTION

The presence of Facebook's Free Basics (known as Internet.org until September 2015) and the Wikimedia Foundation's Wikipedia Zero in Ghana represents a critical crossroads for questions of network neutrality, development practice, and human rights. These applications both fall under the umbrella of "zero-rating," or the practice of subsidizing mobile data. Sponsors of zero-rated data may include telecommunications providers (or telcos), platform providers, content providers, advertisers, or

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than the author(s) must be honored. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from Permissions@acm.org.
ICTD '16 June 03–06, 2016, Ann Arbor, MI, USA
Copyright is held by the owner/author(s). Publication rights licensed to ACM.

ACM 978-1-4503-4306-0/16/06...\$15.00

DOI: <http://dx.doi.org/10.1145/2909609.2909663>

governments. In the case of Free Basics and Wikipedia Zero, platform providers Facebook and the Wikimedia Foundation partner with Ghanaian telcos Airtel and MTN, respectively, to provide free access to their applications. The Free Basics application provides access to Facebook and a country-specific suite of content and services (see Appendix 1 for content and services in Ghana), and Wikipedia Zero provides access to and editing capabilities in all language editions of Wikipedia.

As Free Basics and Wikipedia Zero expand to more countries and regions, zero-rating has become the subject of controversy. While proponents assert its potential to connect more numerous and diverse users to the Internet, critics argue that it may violate network neutrality, and as such may pose a threat to openness and innovation on the Internet [14, 27, 30]. Development practitioners may question the propriety of crucial connectivity services coming from an international for-profit provider like Facebook, as well as the mechanisms by which either Facebook or the non-profit Wikimedia Foundation may be held accountable to users [23, 24]. If access to the Internet is viewed as a human right, these questions gain increased urgency to the international community as both Free Basics and Wikipedia Zero expand into emerging markets in new countries. In these debates, the voices of scholars, institutions, and practitioners are well represented, with the perspectives of users—and, just as critically, non-users—often left unaddressed.

A "something is better than nothing" argument—that is, the view that zero-rated services are better than no connectivity at all—is a common element of the discourse surrounding Free Basics and Wikipedia Zero [5, 37]. Few will disagree with such a proposal. However, a limited choice between "something" and "nothing" does not capture the complexity of the issues surrounding zero-rating, and risks exaggerating the depth of understanding we have about them.

This paper describes the results of an exploratory study conducted in Ghana to examine mobile users' perceptions, motivations, and data-buying strategies around Free Basics and Wikipedia Zero. With these two applications having launched in Ghana only in January 2015 and December 2014 respectively, these issues remain new, under-researched, and unresolved.

At the time of this research in August and September 2015, mobile voice penetration in Ghana was about 122 percent.¹ During the same period, mobile data penetration was about 64 percent.² This does not indicate, however, that every citizen has a

¹ Source: http://www.nca.org.gh/downloads/MOBILE_VOICE_SUBSCRIPTION_TRENDS_FOR_SEPEMBER_2015.pdf

² Source: http://www.nca.org.gh/downloads/MOBILE_DATA_FIGURES_FOR_THE_MONTH_OF_SEPTEMBER_2015.pdf

mobile phone or that over 60 percent use mobile Internet. Given the trend of users owning and using more than one SIM card, an estimated 83 percent of Ghanaians own mobile phones³ and 51 percent routinely use the Internet on their phones.⁴

The mobile telco market in Ghana is fairly competitive, with six main network providers currently serving the country. Free Basics's and Wikipedia Zero's respective telco partners, Airtel and MTN, are in very different market positions, with the older MTN capturing about 48 percent of the market and Airtel in third place with about 14 percent. Other competing telcos include Vodaphone (22 percent), Tigo (13 percent), Glo (5 percent), and Expresso (less than 1 percent).⁵ Aside from Surfline Communications, an exclusively data-centric telco and the first to offer 4G LTE in the capitol city of Accra, these telcos generally offer 3G mobile data service.

The relatively recent emergence of zero-rated services in Ghana, along with its competitive telco environment and growing body of mobile and Internet users, make Ghana an appropriate setting for inquiry into new zero-rated services. Through investigation of the nuances of Ghanaian mobile users' perceptions, motivations, and data-buying strategies around Free Basics and Wikipedia Zero, this paper aims to add new, country-specific dimensions to the larger zero-rating conversation.

The rest of this paper first briefly reviews relevant literature on mobile use and non-use in developing countries, as well as the debate around zero-rating. This is followed by an explanation of the study's research questions and methodology. Key findings around perception, motivation, and data-buying strategies are presented next. The paper concludes with a discussion of the broader implications of those findings and suggestions for future research.

2. RELATED WORK

2.1 Mobile Internet Use in Developing Countries

Access to and use of mobile cell phone technology has increased dramatically in the past decade, especially in the so-called developing world. In Ghana in particular, cell phone ownership has increased more than ten times since 2002, from 8 percent to 83 percent [22].

Highlighting the potential of mobile phones to power Internet adoption, global mobile Internet penetration rates multiplied four times between 2009 and 2014 [11]. Users in developing countries now account for about 75 percent of the world's mobile subscribers, and 55 percent of the world's mobile Internet users [28].

The proliferation of mobile broadband technology is concurrent with global growth in social media use [28]. For example, as of 2015, 52 percent of Internet users in Ghana are on Facebook [6]. As this growth in social media use reaches saturation in some countries and regions, social network and digital platform providers look to developing countries and emerging markets as the greatest source of potential expansion [6]. Indeed, of the 4.3

billion people globally who are not online, 90 percent live in the developing world [11].

Furthermore, indications are that online activity in developing countries is dominated by social media use to the extent that some users equate certain social media platforms with the Internet itself. Miller's [20] ethnographic study of Facebook use in Trinidad finds that users were unclear of the difference between Facebook and the Internet. Several later studies [21, 25, 36] suggest similar conflation of the concepts "Facebook" and "the Internet" among survey respondents in Indonesia, Nigeria, India, Brazil, and the United States. No such conflation has been established for Wikipedia, possibly because the Wikipedia environment serves fewer interactive, social, or commerce purposes.

Rather, research on Wikipedia use in developing countries highlights imbalances in editorship and representation. Wadhwa and Fung [31] describe the challenges associated with "exporting" Wikipedia to so-called developing countries. As a result, the "digital division of labor" and representation on Wikipedia is skewed toward economic centers and developed countries [8, 9].

Barriers to basic Internet access—particularly cost barriers—are also "skewed" to impact developing countries in particular. Low incomes and technology affordability stand in the way of increased mobile Internet uptake, especially in Africa where mobile broadband costs are proportionally highest [6, 11, 28]. Even as technical accessibility improves and 3G networks cover more areas and populations, the affordability of mobile phones and mobile data will be "one of the most decisive factors for actual uptake" of the technology [11].

2.2 The Zero-Rating Response

Zero-rating has emerged as one response to economic barriers to mobile Internet adoption in developing countries. Supporters of zero-rating claim that selectively subsidizing mobile data in developing countries will "jump-start" users' awareness of the Internet's benefits, prompt users to buy larger data plans, and bring more people onto the open Internet [5, 7, 18, 32, 37]. Opponents of this view cite the "plan-less" data strategies of users in developing countries [2], as well as the aforementioned evidence for Facebook/Internet conflation [21, 25, 36] and the substitution effects it may establish. Theoretically, strong cases can be made for either position. Empirically, however, more research is still needed to support any conclusions.

Most research on zero-rating in developing countries focuses on national regulation and policy around network neutrality. Rossini and Moore [24] and Marsden [19] examine zero-rating and network neutrality on a global scale, comparing practices, policy, and regulatory responses in selected North American, South American, South Asian, and Western European countries. Ramos [23] focuses more explicitly on zero-rating's impact in developing countries, developing an analytical framework that evaluates the costs and benefits of network neutrality regulation for users, mobile service providers, and content and application providers.

Less work has been done on zero-rating from the perspective of users and non-users. The most thorough study focusing on users and zero-rating comes from India, the site of perhaps the most intense and internationally publicized network neutrality debate. Kak [12] draws on semi-structured interviews with 18 Indian users and non-users of Free Basics. With triangulation with interviews with telco marketing executives and mobile phone shop retailers, she finds that users "expressed a strong preference for unrestricted all-access plans, even when limited plans are more affordable" or available for a longer period of time [13]. From

³ Source: <http://www.pewglobal.org/2015/04/15/cell-phones-in-africa-communication-lifeline/>

⁴ Source: <http://blog.geopoll.com/mobile-usage-africa>

⁵ Source: <http://www.nca.org.gh/20/105/Market-Share-Statistics.html>

this, she concludes that the free and open Internet is of significant economic value to users.

With the relative lack of user and non-user testimony, the question remains of whether, or to what extent, zero-rated applications act as a “bridge” to the open Internet for new Internet users.

2.3 Making Non-Users Visible

Effectively framing the debate around development-oriented zero-rated applications like Free Basics and Wikipedia Zero requires broadening analytical lenses to include not only users but also non-users of the applications. Non-users’ perspectives can shed light on how people become aware of new technology, what leads them to accept or reject it, and what design and implementation changes may encourage future adoption and positive outcomes.

Questions of non-use go beyond individual agency, with social, cultural, historical, and political restraints limiting the agency of certain groups [1]. At the same time, Wyatt [33] reminds us that non-use can reflect intentional resistance just as much as inequalities or “divides.” In Ghana, Burrell [4] tracks patterns of Internet usage and non-usage over time. She finds that some early tech adopters became non-users as a result of disillusionment or disenchantment with the web. These are only two among many varieties of non-use, including disenfranchisement, displacement, and disinterest [26].

Furthermore, use and non-use need not be binary concepts. Lampe et al. [16] refer to “levels” of Facebook use and non-use characterized by indicators like amount of time spent on the site and number of Facebook “friends.”

In the context of Facebook, Wyche and Baumer [34] “make visible” non-users’ perceptions and beliefs about Facebook in rural Zambia. Similarly, this study attempts to give voice to both users and non-users of zero-rated applications in Ghana.

3. RESEARCH QUESTIONS

In light of the literature described above, this paper addresses three research questions, each of which strives to connect high-level zero-rating debates to ground-level user testimony.

First, how do Ghanaian mobile users perceive Free Basics, Facebook, Wikipedia Zero, and Wikipedia, if at all? The goal of this question is explore users’ awareness, naming, and opinion of the applications, and further to determine the extent to which users conflate the applications with the Internet or other services.

Second, what would motivate Ghanaian mobile users to use, or discourage them from using, Free Basics and Wikipedia Zero, if anything? This inquiry into motivations aims to address why users use a particular zero-rated application, particularly what would motivate current non-users of Facebook or Wikipedia to adopt either platform via the associated zero-rated application.

Third and finally, what role, if any, does the availability of Free Basics and Wikipedia Zero play in Ghanaian mobile users’ strategies for choosing, buying, and using mobile data? This focus on the connection between zero-rated applications and data-buying behavior addresses the larger question of if and how zero-rating can promote access to the open Internet.

4. METHODS AND RESPONDENTS

Fieldwork and data collection to address these questions took place over five weeks in August and September 2015, including time in Accra, Ada, Ho, Kumasi, and Cape Coast.

The sample population was limited only to Ghanaians who use—not even necessarily have or own—mobile phones. Restricting the sample further to users of Free Basics and/or Wikipedia Zero would have been a logical choice. However, I was also interested in non-users, their awareness, and the preferences or restrictions that informed their interaction (or lack thereof) with the applications. Further, limiting my sample to specific platform users could have excluded the very populations—including rural, less educated, and female users—that Free Basics and Wikipedia Zero aspire to engage.

I sampled for maximum variation, trying to engage users of varying demographics and levels of technical experience and expertise. I approached and interviewed respondents *in situ*—for example, at their workplaces, while waiting for *tro tros* (privately owned minivan busses), outside SIM card shops, and at markets. In some cases, particularly in rural locations, respondents were recruited by local informants.

I conducted semi-structured interviews with 25 respondents ranging in age from 18 to 72 years old, and representing both urban and rural communities. Of the 25 respondents, 18 were male and 7 were female. Education experience ranged from elementary education to advanced degrees, and experience with technology similarly varied from low levels of digital literacy to professional hardware and programming skills.

Interviews were mostly conducted one-on-one in English, ranged in length from 15 to 60 minutes, and were not digitally recorded. In rural areas, some interviews were conducted in a group setting. While English is an official language of Ghana, it is not a neutral language; English may be perceived as an inheritance of the British colonial period, the *lingua franca* of contemporary education, or, as one respondent pointed out, “the language of the Internet.” Most respondents were fluent enough in English that no interpreter was needed. For respondents who did not speak English, local informants acted as interpreters.

Interviews began with general questions about which carrier(s) respondents used and their pros and cons. This provided necessary context to ask about specific services—namely, Free Basics and Wikipedia Zero—offered by particular carriers. This part of the conversation generally focused on users’ familiarity with the applications, their reasons for use or non-use, and how the applications influenced other mobile data considerations. More abstract questions to probe for “perceptions” of the zero-rated applications generally came at the end of interviews after building up more context and rapport.

This study’s combination of purposive and convenience sampling is not intended to be representative or generalizable. Instead, my intention in identifying respondents was to capture a range of demographics and users groups, in order to represent a range of possibilities for how Ghanaian users may understand and experience Free Basics and Wikipedia Zero. This sampling strategy is also intended to provide a preliminary impression of the general user landscape and lay a foundation for future, larger-scale studies.

5. FINDINGS

Throughout fieldwork, interview notes were coded into three themes and sub-themes based on the study’s three research questions about perception, motivation, and data-buying strategies.

5.1 Perception of Zero-Rated Applications

Two main perception trends emerged from interviews. First, respondents shared a clear perception of Free Basics and Wikipedia Zero as telco promotions. Second, advanced users—that is, those respondents with advanced degrees and careers in technology-related fields—associated zero-rating with Ghana-specific experiences of exclusion and restriction online.

5.1.1 Telco Promotions

Interviews did not reveal any conflation among “Facebook,” “Free Basics,” “Wikipedia,” “Wikipedia Zero,” and “the Internet.” Instead, respondents consistently thought of both Free Basics and Wikipedia Zero as telco promotions, and did not equate them with “the Internet.” Conversations about these applications quickly jumped, without prompting, to comparisons to other telco promotions and advertisements.

Respondents generally used and understood the phrases “free Facebook on Airtel” and “free Wikipedia on MTN” rather than the brand names Free Basics and Wikipedia Zero. This makes sense given the numerous advertisements for “free Facebook on Airtel” that I encountered in and around Accra, Ho, Kumasi, and Cape Coast (see Figure 1). Respondents in Ho also cited TV and radio commercials for both “free Facebook on Airtel” and “free Wikipedia on MTN.”

A male banker from Accra situated Free Basics and Wikipedia Zero within Ghana’s larger environment of telco competition:

In Ghana, what sells is what advertises a lot. So you see the way Airtel is doing it – ‘free Facebook on Airtel, free Facebook on Airtel.’ That’s how most of the telcos do here.

This “free Facebook” language, however, may conflate Free Basics, Facebook Zero, and separate Airtel-sponsored Facebook services. Such conflation is not limited to users, and may originate in press releases and news articles that use these names and descriptions interchangeably.⁶ On top of this, “zero” language also appears confusing; two respondents conflated Wikipedia Zero with Facebook Zero, Airtel Zero, and other “zero”-named services. While one can imagine these conflations impacting brand recognition and consumer decision-making, it does not indicate that zero-rated applications were manipulating respondents’ perception and awareness of the Internet itself.

5.1.2 Digital Exclusion

Advanced users associated zero-rating with Ghana-specific restrictions on other digital services, including Amazon shipping, PayPal payments, and domain name registration. Each of these respondents prefaced their thoughts on Ghana-specific web restrictions and exclusion with some statement of their awareness of Ghana’s global reputation as a center for “419,” or email scam and fraud schemes.

A co-working space employee in Accra described this digital exclusion as a higher priority than network neutrality, a key element of zero-rating debates:

⁶ For examples, see: “Free Facebook and Internet.org” pricing from Airtel (http://africa.airtel.com/wps/wcm/connect/africarevamp/ghana/home/personal/internet/internetservices/free_facebook); “Airtel Ghana introduces free Facebook, Internet.org app” from All Africa (<http://allafrica.com/stories/201501290665.html>); and “Mark Zuckerberg launches free Facebook on Airtel” from Daily Guide (<http://www.dailyguideghana.com/mark-zuckerberg-launches-free-facebook-onairtel/>).



Figure 1. Airtel flyer advertising “free Facebook.”

The high-level discussion of net neutrality is still growing. Net neutrality is not making a big dent here anyway. The buzzword here is digital inclusion. A lot of Ghanaians are still excluded from the digital economy.

With this in mind, respondents were cognizant of the fact that Free Basics offered country-specific services and content. They were suspicious that this content was more restricted, or differently restricted, in Ghana compared to in other countries.

While talking about limited access to BBC News content on Free Basics, a male graduate student in Accra said:

It would be nice to find out, is it only the Ghana service of Free Basics that is limited in these ways? I am tempted to believe that it might be different in other countries. And if it's better in other countries, we want to tell them [Facebook and Airtel] to reconsider and give us more features.

A male member of the Wikimedia Ghana User Group—a self-assembled group of Ghanaians who edit and contribute to Wikimedia projects like Wikipedia and Wikimedia Commons—echoed this concern. Both expressed frustration that there were no resources online to learn about the services and content that Free Basics offered in other countries.

5.2 Motivation to Use Zero-Rated Applications

Only 5 out of 25 respondents had ever used Free Basics or Wikipedia Zero, and only 3 were active users of either application at the time of fieldwork. With this in mind, fieldwork revealed more information about active barriers to use than motivations for it. These barriers can be roughly categorized into technical and educational barriers, and user uncertainty about how to access and use the applications.

5.2.1 Technical and Educational Barriers

Technical barriers (e.g. connectivity, electricity) and educational barriers (e.g. digital literacy, language literacy) were reported and observed throughout fieldwork.

Wikipedia Ghana User Group members described instances, most recently in late spring 2015, when Wikipedia Zero was down or

“blacked out” for up to a month. One respondent reported being frustrated enough to stop using the application entirely, and no longer checked to see if it was available. Respondents blamed telco MTN, rather than platform provider Wikimedia Foundation, for the blackouts, speculating that MTN was not devoting adequate resources to Wikipedia Zero provision.

Electricity was also a barrier to use. Persistent, unpredictable power outages known as *dumso* (Twi for “off and on”) have been a regular occurrence in Ghana since 2012 due to power supply shortages. Electricity providers shed load to manage the shortages, with rolling blackouts from 12 to 24 hours long. Such power outages were repeatedly observed throughout fieldwork, and respondents reported the outages affecting their ability to charge their mobile phones and power other devices.

Interviews and observation also suggested that digital and language literacy may discourage users, especially rural and female users, from using Free Basics and Wikipedia Zero. Four female farmers between the ages of 22 and 72 in Hehekpoe (a rural community in the Volta Region) used their feature phones only for making calls, and never for text messages. This was not only because three out of four of them could not read or write, but also because they reported they did not know how to manipulate their phones in that way. One respondent said that she was not interested in learning how.

For the 24 percent of Ghana’s population who cannot read or write,⁷ it is reasonable to expect that a text-based application would not be accessible or useful. The number of users facing literacy and language barriers may be higher, particularly in the context of the languages supported on Facebook and Wikipedia. Of Ghana’s eleven government-sponsored languages aside from English, Facebook currently supports one (Akan)⁸ and Wikipedia three (Akan, Twi, Ewe).⁹

5.2.2 Misinformation About Use and Access

Both Free Basics and Wikipedia Zero users expressed inconsistent ideas about how to access and use the applications. A male taxi driver in Accra said that one must call a number to get Free Basics and download an application to get Wikipedia Zero, but had never tried either. Members of the Wikimedia Ghana User Group observed that downloading Wikipedia Zero required a positive data balance on one’s phone, which was contrary to the expectation that users without any data could access the application. Finally, a male NGO employee in Ho expressed general confusion about how he could possibly use either service without “digging into” his data credits.

5.3 Impact of Zero-Rated Applications on Data-Buying Strategies

Interviews suggested that the availability of Free Basics and Wikipedia Zero were minor considerations in respondents’ strategies for choosing, buying, and using mobile data. No respondents indicated a history of or interest in choosing a carrier based on these applications. Instead, I found users employing personal mobile subscription “repertoires” to optimize costs based

on consideration of speed and area coverage, data promotions, and network effects.

These multiple-use strategies were well-informed and specific to individuals’ needs, ranging from a few SIM cards for a Ho high school student to over 20 SIM cards and four phones for an Accra-based journalist.

5.3.1 Speed and Area Coverage

Speed and area coverage depended on one’s area, with respondents in a given city often citing the same group of carriers as the fastest and most reliable. Users in Accra overall reported a wider variety of viable carrier options than rural users, including expensive 4G LTE service on the relatively new telco Surfline Communications. Outside Accra, preference for MTN and Vodaphone was more common.

A teacher in Ho, however, downplayed the importance of speed and quality, saying:

All we want to know is: how expensive it is to make a call? Cheap is more important than quality.

5.3.2 Data Promotions

Respondents consistently cited “data double bonus” deals, in which one’s purchase is matched with the same amount of free data, as having a significant influence on their data-buying decisions. Both Tigo and Airtel, for example, offered deals in which users receive a 10-GHS bonus for buying 10 GHS in data. Airtel’s “credit rollback” or “rollover” feature, in which unused data is returned to users at the end of a given pay or usage period, was also popular.

5.3.3 Network Effects

With calls and texts on the same carrier cheaper than communicating across carriers, more than half of this study’s respondents mentioned some form of network effect as their reason for choosing a certain SIM card. One respondent specifically described the various carriers his spouse, family members, and close friends used; others talked about simply “everyone” being on a certain carrier. This was an even stronger consideration in rural areas, where respondents only used one SIM card and indicated word-of-mouth as their primary source of information about carriers.

Related inertia played a role in keeping users on carriers, even those that performed poorly in speed, area coverage, and data promotions. MTN users in particular complained about “stinginess” and poor customer service—but, at the same time, were reluctant to abandon the body of users that had gathered around Ghana’s most popular carrier. A male IT manager in Accra said:

Almost everyone knows that I use the [MTN] network. Having to change it, and having to tell everyone that I’ve switched—it’s not worth the stress.

Although number portability is available in Ghana, a change in carriers alone affects how expensive it is for a user’s friends and family members to contact them, and merits alerting one’s social networks to the switch.

6. DISCUSSION

The key findings outlined above connect to elements of larger zero-rating conversations, especially in terms of application adoption and decision-making; approaches to network neutrality; and the feasibility of achieving development goals. This

⁷ Source: <http://www.uis.unesco.org/Education/Documents/literacy-statistics-trends-1985-2015.pdf>

⁸ Source: <https://www.facebook.com/translations/Facebook/Locales.xml>

⁹ Source: https://en.wikipedia.org/wiki/List_of_Wikipedias

discussion reflects on the broader implications of these connections, and highlights potential areas for future research.

6.1 Telco Promotions and Decision-Making

Respondents' clear association of Free Basics and Wikipedia Zero with telco promotions raises questions about what might cause users of either application to eventually sign up for, or pay for more, mobile data. This points to a complex relationship between zero-rating, telco marketing, and user decision-making.

Facebook claims that 50 percent of Free Basics users pay for data within 30 days of first coming online via the Free Basics application.¹⁰ This is seen as a desirable outcome, in line with the expectation that zero-rated applications will expose users to the Internet and prompt them to purchase more data [5, 7, 18, 32, 37]. This statistic, if verifiable, does not necessarily imply causation, however. Mobile Internet uptake may be correlated not only with Free Basics use, but also with the telco advertising and promotion that users associate with the application.

The competition among telcos in Ghana makes such promotion and advertising a key consideration. Users' awareness of themselves as sought-after consumers falls within Kuriyak et al.'s [15] model of the "poor as consumer," in which the so-called poor are "active agents within a consumer market, with legitimate spending needs, demands, desires, and constraints to be addressed." Zero-rated applications provide a compelling example of services that attempt to combine corporate and foundation agendas with development goals.

Respondents' association of zero-rated applications with advertising may also interact with this study's clear finding that respondents' data-buying behavior was driven more by telco data promotions than by free access to a specific application. Airtel's advertising for Free Basics, for example, is also advertising for Airtel's own brand, services, rates, and promotions. Telcos' general practice of increasing advertising volume around the launch of an application like Free Basics or Wikipedia Zero may contribute to the coincidence that Facebook reports between users' first interaction with an application and buying data.

Further, this preference for "data double bonus" deals over zero-rated applications suggests that respondents wanted to exercise control over how they used their data to access the Internet. This finding echoes similar user preferences in India [12, 13], and is directly contrary to literature asserting that users do not demand affordable full access [17].

This ultimately suggests that zero-rating's effects on users' data-buying habits may be more complex than either encouraging [5, 7, 18, 32, 37] or discouraging [2] further purchase of mobile data. Alternatively, with the effects of telco marketing and the complexity of users' mobile subscription repertoires in mind, more study might reveal that both scenarios are simultaneously true; some users may buy more data and some less depending on demographic, social, or other variables. If anything, this study proposes that there are more than two potential outcomes to consider.

6.2 Digital Exclusion and Network Neutrality

While questions of network neutrality have dominated the larger zero-rating debate, interviews from this study suggest that digital exclusion—a "flip-side" of network neutrality and the limitations and restrictions it connotes—may be a primary issue to bring to

the fore when considering the role of zero-rating in the Ghanaian information environment. Respondents perceived zero-rated applications as part of a larger experience of Ghanaian digital exclusion. Rather than question whether zero-rating violates concepts of network neutrality, advanced users in particular were more concerned that it represented the most recent elaboration of Ghanaians' marginalization and discrimination on the web.

Respondents' experiences with digital exclusion confirm aspects of Burrell's [3] research on young Accra cybercafé users. Burrell points out that Ghanaian users were primarily seen as a security threat on global networks. Burrell further documents online webmaster forums in which site administrators solicit advice on how to block all Ghanaian IP addresses from accessing a site on the assumption that Ghanaian web traffic will bring only scammers and fraud with no commercial reward.

This finding also aligns with the growing body of work suggesting that initiatives striving to bridge the "digital divide" may actually amplify existing inequalities and divisions [29]. The possibility that users interpret Free Basics and Wikipedia Zero as exclusive rather than inclusive is especially contrary to such applications' stated intent of providing expanded access to online content and services. Thus, a "simplistic narrative that pits [network] neutrality against access" [13] risks overlooking country- and region-specific nuances of digital access and exclusion.

6.3 Barriers and Long-Term Goals

Interviews and observations from this study suggest that zero-rating in Ghana should further be considered in the context of the fundamental barriers between Ghanaian users and Internet access, including connectivity, electricity, digital literacy, and language literacy.

Wyche et al. [35] investigate similar issues of technical and socioeconomic "infrastructure"—including low bandwidth, slow connections, unpredictable electricity, and the costs of mobile phones—associated with rural Kenyan's use of Facebook Zero, a free, entirely text-based version of Facebook customized for basic feature phones. They conclude that "the experience of a service being 'free' is not possible until larger problems such as rural electrification are remedied."

This study's fieldwork included observations of such infrastructural barriers in Ghana. A critical question to consider is that of how zero-rated applications like Free Basics and Wikipedia Zero can achieve their stated goals of expanding online participation when they only address the barrier of mobile data costs.

Beyond practical ways to contribute to mobile application adoption in Ghana, the broader implications of infrastructure constraints may serve to manage the development community's expectations of the range and number of users that zero-rated, text-based, mobile applications can realistically serve.

6.4 Future Research Directions

Further research is needed to validate and expand upon this exploratory study's findings. Country- and community-specific inquiry remains paramount, as generalizing Free Basics's and Wikipedia Zero's impact runs the risk of regarding zero-rating and its development aims as "a set of over-the-counter services" rather than locally specific interventions [10]. In addition to further study in Ghana, engagement with other countries and communities will add more dimensions to our understanding of users' and non-users' relationships with zero-rating.

¹⁰ Source: <https://press.internet.org/2015/08/03/internet-org-mythsand-facts/>

Respondents' consistent perception of zero-rated applications as telco promotions calls for a closer look at advertising's role in zero-rated application uptake, data purchase, and Internet use. The extent of correlation or even causality among these actions can shed light on how both advertising and the availability of zero-rated services influence Internet use outcomes.

This study found technical and educational barriers inhibiting zero-rated application use for particular groups, particularly rural and female users. Further demographic research will add rigor and specificity to this conversation. Of particular interest are the overlaps and dimensions among different demographic and technological indicators. For example, of Ghanaians who cannot read or write, how many own mobile phones? Of the same group, how many have access to reliable electricity? Conversely, of literate Ghanaians, how many have mobile phones and routinely use the Internet? What are these various demographic groups' strategies for buying data and otherwise managing mobile applications? More precise distinction of constraints and how they interact can present a more detailed picture of where text-based digital initiatives may or may not best serve users.

Finally, this study's grouping together of Free Basics and Wikipedia Zero—a multi-content application from a for-profit provider and an online encyclopedia from a not-for-profit provider, respectively—risks privileging their shared zero-rated status above key differences in business model, content, and goals. Future research can highlight these differences and investigate their impact on service provision and user experience.

7. CONCLUSIONS

This paper has drawn on Ghanaian users' self-reported understanding of and experiences with Free Basics and Wikipedia Zero to expand the boundaries of the current zero-rating conversation, with implications for how researchers and practitioners might understand zero-rating moving forward.

The sections above highlight key findings from this study's exploration of zero-rating in Ghana. First, users generally perceived Free Basics and Wikipedia Zero as telco promotions, with some advanced users further categorizing them as experiences of digital exclusion. Second, most respondents did not use either application, because of technical and educational barriers as well as uncertainty about how to access and use them. Third and finally, users' data-buying strategies were unrelated to zero-rated application offerings, and rather revolved around goals to optimize overall usage costs.

These findings are of interest to diverse—and even opposing—stakeholders in the international zero-rating ecosystem. Supporters and critics of zero-rating share the stated goal of connecting more people to the Internet, but the polarized controversy around zero-rating may obscure possibilities for collaboration in pursuit of that goal. This research's ultimate intention is to bring these actors together and spark new conversations based on data that is timely, interesting, and relevant to all of them.

Equitable, universal access to the Internet remains a generally agreed-upon development aim. Close attention to the complex interactions among telco advertising, digital exclusion, socioeconomic barriers, and user agency will be paramount as the development and research communities attempt to better understand zero-rating's impacts.

8. ACKNOWLEDGEMENTS

I thank the respondents and local informants in Ghana who shared their time and knowledge with me. I also thank the anonymous reviewers and other readers for their feedback. I am especially grateful to Araba Sey, Chris Rothschild, and my 2015 Ghana Exploration Seminar peers for their great support while preparing for, conducting, and making sense of this research.

9. REFERENCES

- [1] Baumer, E. P. S., Ames, M. G., Burrell, J., Brubaker, J. R., and Dourish, P. 2015. Why study technology non-use? *First Monday*. 20, 11 (Nov. 2015). DOI: <http://dx.doi.org/10.5210/fm.v20i11.6310>.
- [2] Best, M. 2014. Global computing: The Internet that Facebook built. *Communications of the ACM*. 57, 12 (Dec. 2014), 21-23. DOI: <http://dx.doi.org/10.1145/2676857>.
- [3] Burrell, J. 2012. *Invisible Users: Youth in the Internet Cafes of Urban Ghana*. The MIT Press, Cambridge, MA.
- [4] Burrell, J. 2012. Technology hype versus enduring uses: A longitudinal study of Internet use among early adopters in an African city. *First Monday*. 17, 6 (June 2012). DOI: <http://doi.org/10.5210/fm.v17i6.3964>.
- [5] Carew, D. 2015. Zero-rating: Kick-starting Internet ecosystems in developing countries. Policy Memo. Progressive Policy Institute. Retrieved from: http://www.progressivepolicy.org/wp-content/uploads/2015/03/2015.03-Carew_Zero-Rating_Kick-Starting-Internet-Ecosystems-in-Developing-Countries.pdf.
- [6] Dutta, S., Geiger, T., and Lanvin, B. (Eds.) 2015. The global information and technology report 2015: ICTs for inclusive growth. Insight report. World Economic Forum. Retrieved from: http://www3.weforum.org/docs/WEF_Global_IT_Report_2015.pdf.
- [7] Facebook Board. 2015. Facebook Q4 2014 earnings call transcript. Jan. 2015, Menlo Park, CA. Retrieved from: <http://files.shareholder.com/downloads/AMDA-NJ5DZ/3945132478x0x805927/BA45C6A6-6D93-4DF6-BA81-D3C0B352FF4E/FacebookQ42014EarningsCallTranscript.pdf>.
- [8] Graham, M., and Hogan, B. 2014. Uneven openness: Barriers to MENA representation on Wikipedia. Oxford Internet Institute Report, Oxford, UK. Retrieved from: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2430912.
- [9] Graham, M., Straumann, R. K., and Hogan, B. 2015. Digital divisions of labor and informational magnetism: Mapping participation in Wikipedia. *Annals of the Association of American Geographers*. 105, 6, 1158-1178. DOI: 10.1080/00045608.2015.1072791.
- [10] Gurumurthy, A. and Singh, P. J. 2009. ICTD – Is it a new species of development? Perspective Paper. IT for Change (ITfC). Retrieved from: <http://www.itforchange.net/ICTD-new-species-of-development>.
- [11] ITU. 2014. Measuring the Information Society Report. International Telecommunication Union, Geneva, Switzerland. Retrieved from: https://www.itu.int/en/ITU-D/Statistics/Documents/publications/mis2014/MIS2014_with_out_Annex_4.pdf.

- [12] Kak, A. 2015. The Internet un-bundled: Locating the user's voice in the debate on zero-rating. MSc Dissertation. Oxford Internet Institute. Retrieved from: <http://www.savetheinternet.in/files/amba-kak-thesis.pdf>.
- [13] Kak, A. 2015. Is Free Basics the access that users want. *Business Standard*. (30 Dec 2015). Retrieved from: http://www.business-standard.com/article/opinion/free-basics-vs-net-neutrality-is-free-basics-the-access-that-users-want-115123000131_1.html.
- [14] Kimball, D. 2015. Sponsored data and network neutrality: Exemption and discrimination in the broadband industry. *Media Industries Journal*. 2, 1, 38-59. ISSN: 2373-9037.
- [15] Kuriyak, R., Nafus, D., and Mainwaring, S. 2012. Consumption, technology, and development: The "poor" as "consumer". *Information Technologies & International Development* 8, 1, 1-12. Retrieved from: <http://itidjournal.org/itid/article/viewFile/839/343>.
- [16] Lampe, C., Vitak, J., and Ellison, N. 2013. Users and nonusers: Interactions between levels of Facebook adoption and social capital. *CSCW '13: Proceedings of the 2013 Conference on Computer Supported Cooperative Work*, 809-820. DOI: [10.1145/2441776.2441867](https://doi.org/10.1145/2441776.2441867).
- [17] Layton, R. & Elaluf-Calderwood, S M. 2015. Zero rating: Do hard rules protect or harm consumers and competition? Evidence from Chile, Netherlands, and Slovenia. DOI: [http://dx.doi.org/10.2139/ssrn.2587542](https://dx.doi.org/10.2139/ssrn.2587542).
- [18] Lyons, D. A. 2015. Beyond net neutrality: International examples enabling innovation and consumer choice in the mobile Internet ecosystem. Research Paper 256. *Legal Studies Research Paper Series*. Boston College Law School. Retrieved from: <http://lawdigitalcommons.bc.edu/lfp/942/>.
- [19] Marsden, C. 2015. Comparative case studies in implementing net neutrality; A critical analysis. TPRC 43: The 43rd Research Conference on Communication, Information and Internet Policy. DOI: [http://dx.doi.org/10.2139/ssrn.2587920](https://dx.doi.org/10.2139/ssrn.2587920).
- [20] Miller, D., 2011. *Tales from Facebook*. Polity Press, Cambridge, UK.
- [21] Mirani, L. 2015. Millions of Facebook users have no idea they're using the Internet. *Quartz*. Retrieved from: <http://qz.com/333313/millions-of-facebook-users-have-no-idea-theyre-using-the-internet/>.
- [22] Pew Research Center. 2015. Cell phones in Africa: Communication lifeline. Global Attitudes & Trends. Retrieved from: <http://www.pewglobal.org/2015/04/15/cell-phones-in-africa-communication-lifeline/>.
- [23] Ramos, P. H. S. 2015. 2014. Towards a developmental framework for net neutrality: The rise of sponsored data plans in developing countries. Discussion Paper. Sao Paolo Law School / Stanford Law School. Retrieved from: <http://ssrn.com/abstract=2418307>.
- [24] Rossini, C. & Moore, T. 2015. Exploring zero-rating challenges: Views from five countries. Public Knowledge Working Paper. Public Knowledge Foundation. Retrieved from: <https://www.publicknowledge.org/documents/exploring-zero-rating-challenges-views-from-five-countries>.
- [25] Samarajiva, R. 2014. More Facebook users than Internet users in Southeast Asia? *LIRNEasia blog*. Retrieved from: <http://lirneasia.net/2014/08/more-facebook-users-than-internet-users-in-south-east-asia/>.
- [26] Satchell, C. and Dourish, P. 2009. Beyond the user: Use and non-use in HCI. *OZCHI '09 Proceedings of the 21st Annual Conference of the Australian Computer Human Interaction Special Interest Group*, 9-16. DOI: [10.1145/1738826.1738829](https://doi.org/10.1145/1738826.1738829).
- [27] Singh, P. J. 2015. Net neutrality is basically Internet egalitarianism. *Economic and Political Weekly*. 1, 9. 12-15.
- [28] Sprague, K., Maniyika, J., Chappuis, B., Bughin, J., Grijpink, F., Moodley, L., and Pattabiraman, K. 2014. Offline and falling behind: Barriers to Internet adoption. Technology, Media, and Telecom Practice Report. McKinsey & Company. Full report downloaded from: <http://www.mckinsey.com/industries/high-tech/our-insights/offline-and-falling-behind-barriers-to-internet-adoption>.
- [29] Toyama, K. 2015. Geek Heresy: Rescuing Social Change from the Cult of Technology. Public Affairs, New York, NY.
- [30] Van Schewick, B. 2015. Analysis of proposed network neutrality rules. *Stanford Law School*. Retrieved from: https://cyberlaw.stanford.edu/downloads/vanSchewick2015A_nalysisofProposedNetworkNeutralityRules.pdf.
- [31] Wadhwa, K. and Fung, H. 2014. Converting Western Internet to Indigenous Internet: Lessons from Wikipedia. *Innovations*. 9, 3-4, 127-135. Retrieved from: http://www.mitpressjournals.org/doi/abs/10.1162/inov_a_00224?journalCode=itgg.
- [32] West, D. M. 2015. Digital divide: Improving Internet access in the developing world through affordable services and diverse content. *Brookings Institute Center for Technology Innovation*. Retrieved from: <http://www.brookings.edu/research/papers/2015/02/13-digital-divide-developing-world-west>.
- [33] Wyatt, S. 2003. Non-users also matter: The construction of users and non-users of the Internet. In *How users matter: The Co-Construction of Users and Technologies*, N. Oudshoorn and T. Pinch, Eds. MIT Press, Cambridge, MA, 67-79.
- [34] Wyche, S. and Baumer, E. P. S. 2016. Imagined Facebook: An exploratory study of non-users' perceptions of social media in rural Zambia. *New Media & Society*, 1-17. DOI: [10.1177/1461444815625948](https://doi.org/10.1177/1461444815625948).
- [35] Wyche, S., Schoenebeck, S. Y., and Forte, A. 2013. "Facebook is a luxury": An exploratory study of social media use in rural Kenya. *Proceedings of the 2013 Conference on Computer Supported Cooperative Work*, 33-44. DOI: [10.1145/2441776.2441783](https://doi.org/10.1145/2441776.2441783).
- [36] Quartz. 2015. [Study commissioned with Geopoll to study Facebook/Internet perceptions in Indonesia and Nigeria.] Datasets retrieved from: https://drive.google.com/folderview?id=0B4ZVQwBvLA_Eg_Q1dpQ3VycDVTYkk&usp=sharing.
- [37] Zuckerberg, M. 2015. [Response to open letter regarding Internet.org, net neutrality, privacy, and security in India.] Retrieved from: <https://www.facebook.com/zuck/posts/10102033678947881>.

APPENDICES

1. FREE BASICS GHANA: CONTENT PROVIDERS AND SERVICES

As of August 2015, the following content providers and services were available on Free Basics (then known as Internet.org) in Ghana:

- Accuweather
- BabyCenter & MAMA
- BBC News
- Ebola Information
- Facebook
- Facts for Life
- FunDza
- GhanaWeb
- Girl Effect
- Jobberman
- Messenger
- News24
- Scholars4Dev
- SuperSport
- Tonaton.com
- Wattpad
- Wikipedia

2. SEMI-STRUCTURED INTERVIEW PROTOCOL

Please note: Question order was not pre-determined, and no single interview covered all questions. Some questions may have been immediately observable (e.g. type of phone), while others may have been excluded due to time restrictions or relevance. The categories below were only to aid in question development, organization, and focus. Questions refer to “Internet.org” rather than “Free Basics,” as fieldwork occurred before the name was changed.

Pre-interview

Do you have any questions before we begin?

Demographic information

Age

Gender

Occupation

City

Perception

Have you ever heard of [Internet.org/free Facebook on Airtel / Wikipedia Zero/free Wikipedia on MTN]?

How did you hear about []?

Do you know anyone who uses []?

Who is [] for?

How does [] work?

Do you agree with this statement? “Facebook is the Internet.” or “Wikipedia is the Internet.”

What is the Internet?

Motivations/discouragements

Do you use []?

Do you know anyone who uses []?

What do you use [] for?

What does [] let you do? What do you wish you could do?

Do you follow links out of []?

What network(s) are you using? (“Network” more common than “carrier.”)

What kind of phone are you using?

How did you choose your phone? (*Expect to find – functions, “status,” battery life, price*)

Do you use the Internet on your phone? How? (*Expect to find – wifi or data*)

In what language do you use your phone/the Internet?

Does data speed/quality affect the things you choose to do on your phone? How?

Data-buying strategies

How did you decide on your current network(s)?

What are the pros and cons of the networks(s)?

If I could only buy one SIM card, what network would you recommend I get? Why?

How do you buy credits? (“Credits” more common than “data”)

How many credits do you purchase in a typical week/month?

How often do you purchase more credits?

Do you want to switch networks/add more networks? Why or why not?

Do you want to increase/decrease the amount of data you buy? Why or why not?

Wrap-up

Is there anything else you want to tell me / you think I should know?

Who else should I talk to about this?

Do you have any questions for me?