Research Article

Aboard Abroad: Supporting Transnational Parent–School Communication in Migration-Separated Families

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Abstract

Increased migration means more transnational parenting of children who are left behind in their home countries. Parents pursuing opportunities abroad need to communicate with those who care for these now high-risk children, yet current technologies do not serve them well. Specifically, the technologies do not work for multiple caregivers, which includes parents, guardians, and educators. This research study reports findings of a design exploration into the ways an information and communication platform could be developed to increase communication among parents, guardians, and educators about the left-behind children. We draw on the results of interviews and design activities with 27 migrant parents, children, educators, and guardians living in or with ties to Jamaica. We highlight how hybrid approaches to designing social spaces (merging voice-based and online platforms) could improve access and meet the users' differing needs. Moreover, increasing access opportunities would facilitate the (re)building of trust networks and improve a parent's awareness of their child's needs. We call for privacy, transparency, and visibility to be balanced against each other and built into an information and communication platform to connect the care network as a means of improving acceptance by the users.

Introduction

Transnational parenting and *teleparenting* are two of the terms used in existing literature to refer to the growing phenomenon of adults parenting from a different country than the one in which their children reside (Castañeda & Buck, 2011; Laurie, 2008). Teleparenting affects as many as 25% of children living in some migrant-sending countries (Mazzucato & Schans, 2011). For example, in Jamaica, parental migration means that three-quarters of all households in inner-city Kingston have a child left behind by one or both parents (HelpAge, 2010). Migration has its benefits—foreign remittances (money sent home) amounted to 2 billion in 2010 (14% of Jamaica's GNI), placing it among the top 10 developing countries that receive remittances (Canuto & Rafha, 2011). However, children left behind are more likely to suffer psychological distress and to be vulnerable to abuse, violence, and exploitation, impeding their development into productive adults (D'Emilio et al., 2007). Moreover, children who feel detached from a parent are more likely to engage in risky behaviors and have poor academic outcomes (Mazzucato & Schans, 2011).

Even in the presence of surrogate care by guardians, the importance of continued parental involvement cannot be underestimated. Being involved means being capable of working with an extended network of surrogate caregivers that includes guardians, relatives, and even educators (Brown & Grinter, 2012). In our previous research we found that educators play a crucial role, not only through interactions with the child, but

often being among the earliest adults to spot a child who is experiencing the negative consequences of being left behind (Brown & Grinter, 2012). Typically, this has meant that migrant parents use phone calls, emails, text messaging, social media, or video conferencing with varying levels of "success" (Brown & Grinter, 2012; Laurie, 2008; Madianou & Miller, 2011, 2012). But these technologies have limitations including cost and the types of communication they do or do not enable and with whom. Nor do these tools cater to the desires of a network with members that would locate them in different spaces—the domestic space (in the case of parents) and the workplace (in the case of educators). Parents have different visions of how and when they want to interact with an application than do teachers for whom their interaction forms part of their job function. While family communications research exists, it does not account for the diversity and distributed nature of this type of caregiving.

In this article, we report findings of interviews with concerned parties and use participatory design to address this gap, focusing on understanding the role of technology that supports remote-parent and teacher interaction. Specifically, we conducted interviews and design activities to elicit guidelines for information and communications technologies (ICTs). We describe three design guidelines: 1) adopting hybrid approaches for designing a diverse network, 2) facilitate the (re)building of trust networks, and 3) designing to balance transparency, privacy, and visibility. In the rest of this article, we discuss related work on how migrants and technologies support parent–child and parent–school communication. Next, we describe our research methods and participants. Then we turn to our findings, first discussing parental migration and the case of children left behind as experienced through the lens of transnational migration in the Caribbean. We describe the variety of care arrangements we found and the use of existing technologies, largely the mobile phone, to facilitate care. We also discuss the experience of educators and the gap in the parent–school communication. Finally, we describe the participants' visions for and their perceived benefits of an ICT that supports caregiving. We conclude by discussing considerations for designing technologies that help parents remain engaged from a distance in the school life of their children. Then we offer a conclusion.

Related Work

More than 3% (214 million) of the global population are migrants (UN, 2011). And about 20% of the world's migrant population originates from Latin America and the Caribbean (Pizarro & Villa, 2005). Often seen as a "domestic survival strategy" (D'Emilio et al., 2007)—although not only that—migration allows families living in places with limited opportunities for economic progression to seek economic or educational opportunities abroad (Thomas-Hope, 2005). The resulting remittances—money sent home by the migrant worker—contribute to better health, education, and nutrition for the entire family (D'Emilio et al., 2007). In Mexico, remittances contribute an amount equivalent to the revenue generated by the tourism industry (from foreign exchange) and double the revenue gained from agricultural exports (D'Emilio et al., 2007). In Haiti, these remittances contribute almost a quarter of the gross national product (D'Emilio et al., 2007).

Small islands see particularly high rates of migration (Dumont, Spielvogel & Widmaier, 2010). This holds true for Jamaica. According to a 2009 survey, 15% of Jamaican households had a migrant family member, while another 28% had returned migrants (Lucas & Chappell, 2009). These migrants, even those long separated from families, often become part of a transnational network aiding in the movement of "people, money, goods and ideas" (Thomas-Hope, 2005). More than half of Jamaican households rely on remittances—although they disproportionately benefit the rich (D'Emilio et al., 2007). In total, remittances contribute more to the Jamaican economy than the export sector (Thomas-Hope, 2005). Despite the financial benefits, however, migration is not without significant negative impacts, especially for the children who are left behind by parents. In the case of Jamaica, this separation often spans three to 10 years (D'Emilio et al., 2007). In the 1960s, as many as 98% of Jamaican children did not migrate with their parents to the UK (Smith, Lalonde & Johnson, 2004). Low-income families, unable to support the moving costs for their entire family, experience parent–child separation in far greater numbers than families with higher incomes (D'Emilio et al., 2007).

In their work with Caribbean immigrants in Toronto, Smith et al. (2004) identified two stages of serial migration: 1) the initial parent–child separation and 2) the subsequent reunification in the host country (Smith

et al., 2004). They found that adolescent children who endured long periods of separation experienced lower self-esteem, conformed less to parental authority, and identified less with the migrant parent during reunifica-tion (Smith et al., 2004). Truancy was the most frequent deviant behavior exhibited by these children (Smith et al., 2004). Findings like these make a strong case for wanting to ensure that parents maintain ties during migration-induced separations. In the next sections, we discuss some of the approaches and technologies designed for families that have been adopted to maintain family cohesion during separation. We then discuss technologies in place to support parental involvement in school and their limitations.

Engaging Geographically Distant Parents

Separation caused by migration strains, and even changes, the parent–child relationship. This is especially chal-lenging for the parent–teen relationship, which is already prone to conflict and diminished closeness as part of a child's transition to adulthood (Laursen & Collins, 2004). The distance hinders physical interactions and visits, which are essential to maintaining trust (Lahaie, Hayes, Piper & Heymann, 2009). Feeling abandoned, children may begin to detach themselves from parents (D'Emilio et al., 2007). Moreover, the gendered effects of migra-tion cannot be ignored—with absent mothers, children are more prone to engage in violence and their risk of physical and sexual abuse is heightened (D'Emilio et al., 2007).

It is no surprise that families have adopted social media and other communications technologies to reduce this distance and support "away" parenting (Madianou & Miller, 2012; Smith, Nguyen, Lai, Leshed & Baumer, 2012). For Philippine mothers, the mobile phone has enabled them to parent from afar, such as checking whether a child finished his or her homework or returned home (Madianou & Miller, 2011). Some children felt these calls enabled them to express intimacy, while others felt the frequent phone calls did nothing to improve the parent–child relationship (Madianou & Miller, 2011). And teens who recently moved to college used social networking sites (SNSs) to keep in touch with parents, although less so than sending emails, chatting by video, and calling by phone (Smith et al., 2012). Factors such as convenience, mobility, and accessibility as well as the intent of the communication determined the students' media choices (Smith et al., 2012). Madianou et al. call this practice *polymedia*—referring to the many media choices at one's disposal, where issues such as cost and access are no longer barriers, and so, the focus is on accomplishing the underlying communication intent rather than on media choice (Madianou & Miller, 2012). But between parents and educators, polymedia is not possible. Cost is still a factor—educators would not want to absorb the cost of calling parents—and access is still challenging (a teacher's work hours may not match the times that a parent is accessible). Moreover, SNS tools poorly delineate between the professional and the personal space, making it undesirable as a communi-cation platform between the home and school for educators who want to remain professional and for parents who want to maintain their privacy in the other realms of their lives, separate from their interactions with teachers.

Research has focused on even richer forms of interactions. For example, synchronous media tools—tools that allow for real-time communication and collaboration—have been designed to support shared activities such as playing board games or story time for work-separated and divorce-separated families (Modlitba & Schmandt, 2008; Yarosh, Chew & Abowd, 2009). Many of these systems have focused on young children, rather than adolescents. A second limitation is their reliance on synchronous interaction between users. Third, they have not been designed to include others in the care network, such as educators, who may be the first to notice that being left behind is causing distress for an adolescent.

Supporting Parent–School Communication

Parental involvement is crucial for the proper social and cognitive growth of a child (Lahaie et al., 2009). For example, left-behind children have higher school drop-out rates and many do not seek education beyond the secondary level compared to children with parents at home (Lahaie et al., 2009). In one study, as many as 63% of left-behind children reported skipping school without good reason (Smith et al., 2004).

Given the importance of parental engagement in the academic life of a child, research has focused on increasing parent–school communication (Penuel et al., 2002; Turner, 2010). Commercial online Web portals support sharing children's grades and assignments with parents and facilitate home–school communication (Penuel et al., 2002). For instance, Edmodo—an online social network site—includes functionality so teachers

Table 1. Two-Phase Study Summary.

Phase	# of Participants	Study Location	Methods
1	8 (migrant parents and adults left behind as teens)	United States (urban city)	In-person and remote interviews
2	19 (left-behind children, guardians, educators)	Jamaica (populous urban city, populous urban center in a rural town)	In-person interviews, design activities

can make a student's progress visible to his or her parents (Fardoun, Alghazzawi, López, Penichet & Gallud, 2012). Many of these technologies are media heavy and accessible only via a Web browser on a laptop or desktop computer. They have not yet been optimized for mobile tools or available in full form, ignoring the pervasiveness of this medium, particularly in the countries where migration is common. Other systems have used voicemail to support exchanges between parents and teachers (e.g., Turner, 2010), but these systems are often designed with the premise that parents will follow up in person—impossible for parents who are abroad. Additionally, many commercial options expect schools to absorb the costs of purchasing equipment and licenses, unrealistic for schools in developing countries with few resources. For all these reasons, we see an opportunity to create low-cost systems that function on readily available platforms (e.g., the mobile phone) and that support the unique needs of connecting migration-separated parents and educators in particular.

Research Methods

Our research took place at multiple sites in two countries—the United States and Jamaica (see Table 1). In the study's first phase, we interviewed eight migrant parents and adults who had been left-behind children as teens. We focused primarily on adults who underwent parental separation during adolescence and on parents who left during their child's adolescent years (Laursen & Collins, 2004). During the interview, we focused on understanding the migration experience and its impact on parenting and parent–child connectedness. From the first phase of the study, we learned of the difficulties parents had in maintaining their parental role, even with daily phone calls home. Most notably, migrant parents found it difficult to connect with the people who mattered most (e.g. their children's educators and school counselors), except for co-located guardians. Specifically, parents spoke about the value of interacting with teachers because they knew so much about the children, but lamented the difficulties of establishing and maintaining this conversation. Based on this, we decided to include educators (in addition to the guardians, parents, and children) in our future work.

In the second phase of the study, 19 participants engaged in interviews and participatory design activities. *Participatory design* (PD) underscores the needs of users while paying attention to their context of use (i.e. the circumstances surrounding use) (Ehn, 2008). PD also highlights the challenges and opportunities that accompany that same context of use (Kensing & Blomberg, 1998). We chose to do design activities in addition to the interviews so participants could articulate how technologies enable collaboration in a care network.

Participants in Phase 2 were recruited from two of the 14 parishes in Jamaica (political subdivisions equivalent to U.S. counties). One was an urban city (population under 100,000) and the other a rural but populous town (population 60,000) that was the urban center in that parish. People in both locales had access to similar infrastructure—mobile phones were ubiquitous and the Internet was available at schools, public libraries, and Internet cafés. Both areas had electricity and offered broadband Internet connectivity to those who could afford it. Many of our participants either had access to the Internet at home or had had it at some point. Access to the Internet often depended on the receipt of remittances. Others used the Internet at local libraries or Internet cafés and, in the case of students, at school once classes were finished. In the second phase of our study, we enrolled eight currently left-behind children, three of their guardians, and eight educators. We did not recruit parents since they were distributed across several countries, which would have made it quite challenging to conduct design activities. The Phase 1 interviews with parents however, as well as input from the remaining participants provided enough insight into the parents' needs and desires.

Table 2. List of Participant Children Currently Separated from Parents.

Participant #	Gender	Age Now	Age When Left	Parent Abroad	Country of Residence	Migration Type	Guardian
1	Male	18	17	Mother	U.S.	Seasonal	Aunt
2	Female	15	10	Mother	Canada	Temporary (indefinite)	Father
3	Male	13–17	3	Father	U.S.	Serial	Grandmother
4	Male	15	13	Mother	U.S.	Serial	Aunt
5	Male	14	7	Father	Cayman	Parental	Family Friend
6	Female	18	15	Both	M–Canada F–U.S.	M–Temporary (indefinite) F–Serial	Sister
7	Male	16	6	Mother	Denmark	Parental to Serial	Father/ Grandmother
8	Female	18	14	Father	U.S.	Serial	Mother

The age range of students in Jamaican secondary schools is 11–18 years old (there are no middle schools in Jamaica as there are in the United States). Children in the study, teenagers aged 13–18, all attended local high schools (see Table 2). Regardless of where the students lived (whether in a city or in a town), their status as "barrel children"—a term coined in the Caribbean in reference to children who receive gifts in corrugated barrels shipped home in lieu of a parent's presence (D'Emilio et al., 2007)—often meant their socioeconomic status was elevated compared to others in the area. This also meant our teen participants in both locations had similarities. They owned mobile phones and, at times, other devices such as laptops, tablets, and smartphones. The length of separation from their parents varied from two to more than 10 years.

Most had parents who migrated to the U.S., UK, Canada, or other small Caribbean islands. Some saw their parents at least once a year, while others had not seen their parents since they migrated. Most communicated on a regular basis, as we detail in the Results section. Almost all the children were uncertain whether they would migrate or when the parents would return, if at all. The guardians we interviewed were all women in moderate-income households and included a young working mother and two older retirees, one a grandmother and the other, a non-relative family friend. While the mother had moderate technology experience, the older women were not technologically savvy, although they could make phone calls on their mobile phones. Despite this limited experience, they were able to use technology such as email and video conferencing with the assistance of others in the household, often a child. The educators were a mix of young adult and middle-aged men and women working at public and private high schools, in one of two research locations. Some worked at the same schools as those attended by the child participants. The educators included five teachers of various subjects, one dean of discipline (a recent position instituted to oversee student adherence to school rules and authority), one vice principal, and one person in a dual role as dean of discipline and vice principal. All owned a mobile phone, including smartphones, knew how to operate a computer, and had Internet access either at home, in the staff room, or on their mobile phone.

Participatory design sessions were held at locations convenient for the participants. This included local libraries, schools, churches, outdoor courtyards, and the researcher's base within the community. The first author conducted the interviews in a mix of English and the Jamaican patois to encourage participation and build trust. Participants completed the design activities on an individual basis. During the sessions, they were asked to draw (although some preferred to write) their vision for how a social application could be designed to connect the network of parents, educators, guardians, and children, to which the participants themselves belonged (see Figure 1). We questioned them on the types of information and artifacts they would contribute were we to build such a social space. We also spoke about the types of content they would like to see being
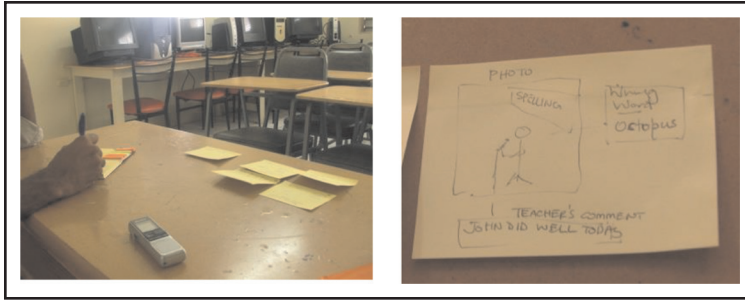
Figure 1. Design activity with teacher participant.

shared by others, as well as the audience with which they would share different types of content. We also captured the perceived benefits they felt such an application would have for themselves or for others. Finally they discussed some concerns they had about the design concept.

Following an inductive data-driven approach (Thomas, 2003), we analyzed the interview data and resulting designs for thematic connections. In the next section, we highlight the findings, beginning with a description of parental migration as encountered and/or experienced by participants in the Jamaican context. We then detail the results of the design activities that captured the participants' visions for a social space that would connect the caregiving network of left-behind children.

Results

We group our results under three topics: 1) migration and caregiving, which captures the families' experiences during parental separation, 2) parent–school communication, which outlines the challenges and implications of low parental involvement during migration, and 3) bridging networks at a distance, which highlights the participants' vision for the design of a social space to bridge home–school communication, including designing for visibility, transparency, and privacy, and mitigating concerns about the use of such an application. The first two topics provide context for the rest of the article and summarize previous work (Brown & Grinter, 2012), which can be referred to for more details on how families currently use technologies, their reasons for predominant use of the mobile phone, and the implications for caregiving.

Migration and Caregiving

Our interviews with participants captured important aspects of the Jamaican migration context, given this context is important for understanding the subsequent questions around technology use and the motivations for the resulting designs. The first concern involves guardianship and caregiving arrangements of children. Caregiving responsibilities for a child were often shared. We found different care arrangements based on whether the child lived with a parent, a relative guardian, nonrelative guardian, or whether they lived alone. The care arrangement, as we discovered from previous work (Brown & Grinter, 2012), influenced the role and capabilities of the migrant parent, such as their ability to assume authoritative roles and their consequent use of communication technologies. Additionally, the use of the mobile phone or landline dominated the parent–child and parent–caregiver communication (Brown & Grinter, 2012). Such technologies (i.e., mobile phones) were usually gifted to the child by a migrant parent so as to match the technology available to the parent abroad. Along with these tools, the parent also sent the funds to support the child's use of the technology such as purchasing call credit. Although we looked for other cases of technology or social media use, we found use of these, if at all, to be episodic, while the mobile phone was used on a daily basis (Brown & Grinter, 2012). In large part, parents were low adopters and felt the mobile phone was sufficient for communicating with children, although not with the extended network. Overall, we found three motivations for which migrant parents used the mobile phone.

1. **Triangulating the Truth:** Participants (parents, guardians, educators and children alike) reported the importance of migrant parents being able to hear multiple sides of a story. This was often accomplished by phone calls (some mediated) to different members of the child's network based on the nature of the situation. For instance, parents called guardians or teachers to verify information conveyed to them by their children.

2. **Remote Household Interaction and Micromanagement:** There were reports of migrant parents using phone calls to mediate household matters remotely. They called to ensure children completed chores or homework, complied with rules they had set, or to ease guardian–child tension.

3. **Mediated Access to Their Child's Care Network:** The mobile phone presented opportunities for parents to communicate with particular members of a child's network in a mediated manner. For instance, a parent would have the child initiate a phone call from their mobile phone while at school and then hand it to their teacher so he or she could talk with the parents.

In focusing on these technologies used to bridge the distance, we found that cost structure (i.e., who could initiate phone calls), trust levels among individuals, and childrearing arrangements impacted communication practices and parental authority.

Parent–School Communication (or Lack Thereof)

Educators, as we found, assumed moral and emotional caregiving roles (Brown & Grinter, 2012). Their frequent interaction with these children stimulated empathy. A child's left-behind status cautioned teachers to look for signs of psychological distress such as withdrawn or authoritative behavior as well as fluctuating academics, poor attendance, or an apathetic attitude toward school, all telltale signs of insufficient guardianship or an absence altogether of guardianship. The educators reported that children of migrant parents at times adopted a "waiting to migrate" attitude, i.e., the assumption that one doesn't have to work hard now because he or she will migrate to another country at any moment. (We have expanded on other telltale factors in previous work [Brown & Grinter, 2012]).

Given all the challenges, educators wished to connect with migrant parents to get a sense of the child's home environment and their family's migration goals. In most cases, this communication did not happen, which caused difficulty for teachers in assisting these children. One teacher spoke of being unable to enroll a child in a school feeding program because she could not secure the signature of a parent or legal guardian. Only a few parents were able to overcome the distance and forge functional relationships with their children's educators. In cases where parents had direct access to the child's school teachers, those parents were likely teachers themselves at the same institution prior to migrating or had relatives or friends serving on staff at their child's school and so had the information necessary to make contact. In those situations, it was much easier for the parent to obtain information about their child's academic performance directly from the school. Yet, as one adult who was formerly a left-behind child stated during her reflection, parental involvement (by the remote parent) when present was important. She described how her migrant mother's continued involvement with her school while away allowed her mother to identify an opportunity to provide assistance the child needed:

> I was struggling in school and [my mom] called me and she asked me about it but I didn't tell her anything . . . but because [the teacher] who was helping me at the time was her friend, she told my dad, then my mom called her and she told my mom. I guess I wasn't paying attention so my mom got me a tutor. (Rayna,[1] adult previously left behind)

Other parents worked around the cost issue that prevented teachers from communicating with parents abroad. The parents initiated the calls to teachers directly or provided the teacher with phone credit to initiate the call: "Good parents you know who will even send you credit to call. Or if they don't do that they just know that they must call you every two weeks or something like that" (Samuel, educator). Hence, the mobile phone worked for some parents, but only a few, mainly those embedded in social networks that were sustained postmigration abroad. For others, parents and educators alike, they wanted to connect with each other, but the opportunities to do so were lacking due to such socioeconomic reasons as cost or being disconnected from a changing network of educators and nontraditional caregivers (such as community members).

Bridging Networks at a Distance

A disconnected care network means that parents miss out on opportunities to assist in the emotional, physical, and academic development of their child. It also means that some members of the care network, such as

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1. Names of all informants changed to protect confidentiality.

educators, can't be as effective in their duties as they would like. Knowing this, a teacher described the benefit a social space that connected all concerned caregivers could have:

> It would be a tremendous benefit. Because what you have here, you have all the parents and stakeholders in the child's education in one place. It makes things that much easier, and the parents can see everything holistically, instead of getting it piece by piece and not knowing how to put the pieces together. (Samuel, educator).

In the following paragraphs, we highlight recurring themes in the desires expressed by our participants for a social space to connect migrant parents, caregivers, educators, and left-behind children.

Visibility

Migrant parents, educators, and children pictured an application that enabled visibility into (i.e. a deeper understanding of) a child's home and school life by making the members of the care network visible and accessible. Visibility into the child's home environment and living conditions was key for educators to understand how to more effectively help the child. For instance, knowing that the child lives with a grandmother or in a household without parental authority allowed educators to empathize with the child and even understand the source of any behavioral issues. Knowing the migration situation (whether a child was expected to migrate or their parents intended to return) could help educators better prepare the student for remaining in the country or transitioning abroad. Additionally, knowing what the parent–child relationship was like could help educators gauge their interactions with the child. Students did not always accurately, if at all, convey this information to educators.

Parents, too, echoed the sentiments of educators. Visibility into the school environment and academic lives of their child allowed parents to better identify opportunities to intervene such as through the provision of an after-school tutor to help the child or finances to support extracurricular activities. Even children vouched for visibility of a parent's involvement in their lives to help with self-presentation (i.e. managing the impression others form of them) (Goffman, 1959). Often a child wanted a parent's presence to be made more noticeable so as to correct the misperception of being "parentless," given his or her status of left behind. "[With this network, my mom] would take interest in my schoolwork, my teachers would see that my parents are interested . . . They call us 'the endangered species'" (Lisa, child). They also wanted parents to hear from the educators themselves how he or she was performing. We see, then, how the participants envisioned an application that would improve the visibility of people and their interactions. The participants believed this would help to establish or bridge the transnational network and provide some accountability despite the distance.

Transparency and Privacy

In the context of this discussion, we describe *transparency* as information made accessible to all concerned parties, and *privacy* is defined as the notion that one is in control of who or what has access to information one has shared (Erickson & Kellogg, 2000). Concerning transparency, educators believed that the parent–teacher exchange should be made transparent to the child given our target group of teenagers. Some educators, for instance, believed adolescents were at an age where they could also speak for themselves and, as such, should be included in conversations concerning them. One teacher stated:

> Everything here [should be shared with the student]. Why should something be said about me and I am the student and I don't know. If it's about me [the student], I am not performing to the best of my abilities let me know so that I can work on it. Transparency is important. (Teresa, educator)

Participants, however, expressed tension between visibility and privacy. Although most teachers agreed that transparency was important, they were divided about the level of transparency the network should provide. While Teresa felt the conversations and interactions should be done in the open and be fully transparent, those who were more conservative wanted privacy controls. For instance, the technology should provide sharing mechanisms that would allow educators to specify who could see the content they posted. The children were also divided on whether they would want the parent–teacher exchange to be fully transparent or kept private. Those in support of full transparency said it would allow them to share their side of the story: "Yeah I would

like to see [the conversation] because I would like to give my side of the story" (Michael, child). Other teens, however, felt it would be unproductive—stating that what was said about them, if negative, would cause them to continue that behavior as an act of nonconformity.

Finally, with regard to privacy, educators felt that nonlife-threatening information told to them by children in confidence was privileged information. This was not to be shared with the parent online, as doing so would infringe on the teacher–student relationship.

Hesitation to Adopt

Educators found SNSs to be a contemporary technology, useful for connecting with younger parents but expressed concerns about formality, identity, time, and ecosystems. We highlight these concerns individually.

Formality: Stemming from their experiences with SNSs such as Facebook and Twitter, some educators expressed concerns that adopting something similar would lead to informality (since SNS assumes familiarity). This would change the formal nature of the parent–teacher relationship, which educators did not want. Moreover, they felt it would encourage the use of colloquial language and that shared content (comments and photos) would be difficult to monitor for appropriateness. Such thinking may reflect cultural expectations and generational gaps.

> But if it's something like Facebook and Twitter and so on, I don't know. Maybe because I am one of the older teachers. I think we would have lost the whole basis of formal communication . . . the parents will be very young and they would be [responding] in the BB or in text language. (Teresa, educator)

Identity verification: Some educators felt that anonymous content or content written pseudonymously should be disallowed on the platform. Revealing a user's identity was important to providing accountability for content posted. Other fears focused on knowing the true identity of the people they were connecting with. One fear for this teacher was whether a parent was in fact using the application him- or herself or if it was the child using the parent's account:

> With technology these days, I might send a message through that medium and the parent might actually allow their child to know their password and I'll be there thinking that I am communicating with the parent when I am indeed communicating with the child. (Jane, educator)

Hence, a network could provide additional authentication such as taking the parent's photo when they accessed the account or requiring a digital signature. Supporting voice interactions could also provide some assurance during the parent–teacher exchange.

Time commitment: A few teachers were concerned about the time commitment of using a new social tool. Expecting that the application would only be accessible via a desktop or laptop computer, one teacher feared that it would encroach on her personal time or require her full attention, whereas she felt the mobile phone did not: "It [the application] is just too time consuming and it needs too much of you. I can walk around with the cell at my ears and do all that I am doing" (Ann-Marie, educator). Given the ability to multitask that the mobile phone provided, she felt comfortable issuing her personal phone number to parents: "Most of the children who get into trouble the parent have my number my personal number at that so they call me anytime" (Ann-Marie, educator). Hence, the factors influencing her choice of tools were mobility and platform flexibility. Consideration would need to take into account how the system would integrate with teachers' existing work practices so as not to create additional work. For instance, the system could be designed as an interactive voice application accessible on the go via a phone call in lieu of a more complex interface. Additionally it could be integrated with classes to allow teachers to record observations in real time and quickly recall past interactions to recount to the parents.

Ecosystems: Some teachers were hesitant because they felt the success of a communication platform would require other things to be in place such as better school facilities. For those who taught in large public schools (with well over 40 students per class), smaller class sizes would allow for more time to observe individual students and communicate with their families.

Thus, mitigating the concerns around technologies could drive user acceptance of the application.

Table 3. Summary of Design Principles for Supporting Transnational Home–School Communication. (Guardians were not included since they desired minimal interactions, preferring to communicate on an as-needed basis.)

Design Principles	Parents	Teachers	Children (teens)
Adopt hybrid approaches in designing for a diverse network	Accessible UI: Simple, mobile accessible, and/or voice based	Formal UI: Single-purpose application, Web portal	Interactive UI: Feature rich, integrated with existing SNS
Facilitate the (re)building of trust networks	Provide a credible source of information about the child	Provide window into the family life	Connect parents with teachers to confirm information that children share
Design to balance transparency, privacy, and visibility	Design for privacy	Design for transparency, accountability, and teacher–child confidentiality	Design for visibility of the parent–teacher exchange (e.g., provide notifications)

Discussion

Information and communication technologies for development (ICT4D) has been concerned with issues of youth development, education, job attainment, and migration (Yin, 2014). We saw how migration, as a domestic survival strategy, has given rise to a vulnerable and at-risk population of children left behind in the home country. There has been an absence of ICT4D research that focuses on the needs of this group. Our research, then, calls for us to focus on the dire situation of children left behind. This increasing demographic faces vulnerability and poor development, challenges often masked by their increase in resources and finances remitted to them by migrant parents.

While the mobile phone has enabled parents to connect with their children and some members of the child's caregiver network and to retain a degree of parental authority, the phone still has its limitations. For instance, it does not allow individuals to manage a changing network and lacks features to provide richer interactions. As a result, our participants were enthusiastic about having a network that would enhance communication among home, school, and the parents abroad. Use of social networking tools seems promising, as it greatly diminishes the cost and distance barriers associated with mobile phones. Yet we see even the limitations that existing SNSs pose as they are not tailored to reflect the desires of the network. At times, transparency and visibility are lacking, and privacy is often difficult to control. In their traditional form, SNSs appear too informal, blur the boundaries between one's professional and private life, and may not support simple access from nonfeature-rich devices.

For these reasons, educators and parents alike were not drawn to using existing social networking sites to communicate, but preferred a solution designed solely for their purpose. We next highlight some design principles (summarized in Table 3) for mediating the home–school communication through the design of social tools to keep remote parents aboard abroad, i.e., engaged in the school life of their children (residing in resource-constrained environments).

Adopt Hybrid Approaches When Designing for a Diverse Network

Although individuals all wanted to increase information sharing among members of the care network, they expressed differences in their vision for a social space. Teachers felt a social space would allow them to engage with the child's household and parents abroad, allowing the educators to better serve their students. Children saw it as a way to improve their left-behind status by making parental involvement more visible. Guardians felt it would help to alleviate some of the caregiving duties by allowing migrants to assume more parental roles at a distance. Parents, of course, wanted to parent, i.e., provide emotional and psychological care for children despite the distance. Moreover, the manner in which parents wanted to engage and interact with others on the network was different. Children wanted frequent and engaging interactions such as the ability to post

pictures and leave comments, similar to how they engaged on informal social networks. By contrast, teachers wanted more restricted engagement and interactions that were not time consuming and that retained the formality of the parent–teacher communication. Parents desired more frequent engagement, so as not to miss out on the child's daily activities and educational progress. Finally, guardians wanted to engage only as needed, since they viewed such a platform more as a tool to engage the remote parent.

To therefore balance the desires of this user group, one would need to design the system and interface in a way that caters to a diverse group of individuals with differing expectations for what interaction on a social space should look like. For teachers, the system would need to be designed exclusively for the parent–teacher communication (rather than leveraging an existing platform). This could be in the form of a Web portal, with a more formal look and feel that allowed for accountability (i.e., identity tied to posts). It should encourage the use of formal speech and positive language. This would mirror their expectations and offline experiences. Moreover, the portal should be asynchronous, mobile, and accessible from multiple platforms (with less reliance on the school's infrastructure) such as Internet-enabled smartphones, which many teachers already possessed. This would allow them to use it on their own terms and at times and locations convenient for them. For parents, a constant stream of content coming in from various individuals would help them feel in the loop. Moreover, many of them were less prone to using a computer due to busy schedules or lack of comfort in using them. Looking into ways, then, to make the social space accessible through their mobile phone was needed. The application could have as another point of access (in addition to the online portal) an interactive voice response application to support voice and text message exchanges via a standard mobile phone. Voice-based social media solutions already exist. For instance, Avaaj Otalo, is an interactive voice application for farmers in rural India to communicate and share expertise with each other (Patel, Shah & Savani, 2012). With such a design, parents could call in to access voicemails by calling a local number (much like calling in to check one's bank account balance). This is already in line with what they can do and does not require new technology or new skills. Text-based messages sent through the application by teachers would be delivered as text messages directly to the parents' mobile phones. And for those parents who prefer the Internet, a Web portal would provide an alternative (though not a required) point of access. And perhaps, given children's desire for informality, designing a separate space or integrating with the social applications they already use might be a good approach.

This work, then, extends research on both voice-based virtual communities and online communities by proposing hybrid designs that merge both approaches to implement a social space, providing richer flexibility to better meet the needs of a diverse and distributed group.

Facilitate the (Re)Building of "Trust Networks"

Generating trust in a group is contingent on the ability to forge strong ties with others (Tilly, 2007). Trust is important in transnational networks because it provides the supporting structure for information exchange, support, remittances, and so forth during migration (Tilly, 2007). The distance that comes with migration, however, often prevents the formation of the strong ties that facilitate trust, particularly between parents and teachers, who are disconnected. Connecting the care network in a way that leads to increased transparency and accountability is one way to develop strong ties and allow for trust to develop among members of the network. We saw how a teacher, able to forge this strong tie through a connection with a parent abroad, was willing to take on other duties such as mediating financial transactions between the parent and child. Hence, a network should make it easier to keep the lines of communication open, allowing individuals to develop and define their trust relationships and define their expectations. We see examples of this in the domestic space where SNSs help maintain trust networks, and our work extends this discussion by investigating how this can be accomplished with members who reside across the domestic and work space (Madianou & Miller, 2012).

Design to Balance Transparency, Privacy, and Visibility

Finally, social translucent systems are designed to support social processes which involves providing visibility (of socially significant information), awareness (which brings social norm into play) and subsequently accountability (for one's actions) (Erickson & Kellogg, 2000). Considering this approach in the design of online systems allows for social norms (that tend to be lost in the digital realm) to be present in online interactions. Allowing individuals in a distributed group, for instance, to "see" each other's actions online, enables conformity with

social norms expected in offline social interactions (Erickson & Kellogg, 2000). Our participants brought up the need for visibility of several matters—for instance, visibility of the interactions between parents and educators. Yet in addition to that, participants were split over wanting some level of transparency but also privacy. Following social translucence approaches, an application could, for instance, allow children to see and comment on messages exchanged between a parent and an educator. A more conservative approach might conceal the specific details of the parent–teacher exchange but send a text message to notify the teen when the exchange occurred. Such a design could help ease the tension between privacy and transparency. As an added benefit, such a design would discourage behaviors beyond social norms such as oversurveillance by "helicopter" parents.

In terms of visibility, the system should allow educators to unintrusively acquire information from parents and guardians about matters of the home and family background. It should let parents gain insight into the academic progress and challenges of their children from educators. Additionally, we saw how important it was to children that others see their parents as engaged and active in their lives. A social space could make parents' interactions visible. Parents could comment on content shared by others such as a picture of the child receiving an award at school. They could participate remotely in Parent-Teachers Association (PTA) decisions through polls completed beforehand and later displayed alongside their image during PTA meetings. Considering the negatives as well, increasing visibility in this way could further marginalize those children whose parents are not only absent but in fact inactive in their lives or those who choose not to use such a platform. In terms of privacy, accidentally posting personal information about a child publicly on Facebook, for instance, could have irreversible consequences. Therefore, ways to ensure people are accountable for maintaining privacy is important. There is an obvious need to find the appropriate balance among privacy (given the sensitive nature of the subject), transparency, and visibility, given the teenage target group, who should also be kept accountable for their actions.

Conclusion

Children with migrant parents are three times more likely to have academic and behavioral challenges than children with parents who live locally—a disadvantage that could be lessened with more parent–school involvement (Lahaie et al., 2009). Bridging the parent–school communication disconnect is especially important, given that educators interact with children on a daily basis yet are likely to be omitted from conversations concerning the child. Bridging this disconnection can, in turn, also help improve parent–child connectedness. We offer these insights as a first step toward the design of a social space to support transnational parent–school communication. We propose catering to the needs of a diverse group through hybrid approaches to designing social spaces (merging both voice-based and online platforms) that allow flexible access. We discuss approaches that would facilitate the development of trust networks through an SNS that would span the work and domestic space. Finally, we offer suggestions on how to find the right balance between privacy and transparency in a social space and to provide visibility. Connecting parents with those who matter in their children's lives, such as educators, help parents to stay aboard while living abroad and could mitigate some of the developmental challenges faced by children who are left behind. As a next step, we plan to explore ways to collect and visualize information from a network of distributed caregivers in a manner that gives parents a more holistic understanding of the status and well-being of their child from trusted sources. This will help them to spot opportunities for intervention in their child's life despite the distance. ■

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