Midwives with mobiles: A dialectical perspective on gender arising from technology introduction in rural Indonesia

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Abstract
Mobile phones were introduced to rural midwives in tsunami-affected Indonesia, allowing them to contact medical experts and communicate with patients. 92 interviews were conducted with midwives, coordinators, doctors, and village representatives. This study applies a dialectical perspective to supplement the analytical frame of the ICT for healthcare development model (Chib et al., 2008), by addressing the multi-dimensionality of benefits and barriers. The theory of dialectical tension (Baxter and Montgomery, 1996) situates the conceptual discussion around the struggles between autonomy and subordination within gender roles, personal growth versus technological competency, and issues of economic and resource control in traditional hierarchies. We find that midwives engage in legitimization strategies, develop peer support, and focus on strategic issues to develop the capacity for agency and autonomy, despite socio-organizational barriers. Specific recommendations are offered, focusing on the resourcefulness and desire of women.

Key words
gender, healthcare, Indonesia, mhealth, mobile, tsunami
Introduction

The unabated loss of life due to maternal and infant mortality is arguably one of the persisting tragedies of the 21st century (World Health Organization, 2007). Lives can be saved by providing trained medical personnel attending during pregnancy, and access to emergency facilities during delivery (Freedman et al., 2007; Romano and Lothian, 2008). However, in developing countries with the greatest need, the scarcity of skilled healthcare workers, including community healthcare workers (CHWs), such as rural midwives, poses a crucial challenge. One mitigating strategy to improve the effectiveness of frontline CHWs involves utilizing technologies for enhanced communication, knowledge-sharing, and capacity building.

Mobile phone use in healthcare

Information and communication technologies (ICT) have contributed to women’s development, particularly in the domains of livelihood (Huyer and Mitter, 2003; Jorge, 2002; Mijumbi, 2002), education (Paik, 2002), and social advancement (Richardson, Ramirez and Haq, 2000). However, attention needs to be drawn to the use of mobile phones to improve hitherto inaccessible and inadequate healthcare services (Olla and Tan, 2008). The majority of 4.6 billion global mobile users are located in developing countries, with penetration increasingly extending to remote rural areas with hitherto poor communication infrastructures (Mishra and Singh, 2008). The mobile cellular penetration rate (57%) far exceeds that for the internet (18%); disparities in their relative growth rates suggest the importance of wireless technologies in delivering development benefits when compared with fixed-line infrastructures normally related to internet access via computers (International Telecommunications Union, 2009; Lee and Chib, 2008). However, constraints to the effective use of ICTs remain, as in other aspects of social life, regarding gender equality.

Gender divide

Some scholars suggest that women are less likely to access and use ICTs (Hafkin and Huyer, 2007), whilst others have commented on the lack of a gender focus in both organic ICT diffusion and targeted ICT for development (ICTD) programs (Hafkin, 2002; Morgan et al., 2004). A recent review of 145 articles of the mHealth, or mobile phones in healthcare, literature in the context of developing countries (Mechael et al., 2010) sheds little illumination on the role of gender as a critical variable in technology introduction and adoption. In order to understand gender from key sociological, technological, and economic perspectives (Chib, 2010), this article uses the ICT for healthcare development (ICT4H) model (Chib et al., 2008).

The ICT4H model (see Figure 1) posits that mobile phones can improve productivity for healthcare workers, increasing their capacity and potential; facilitate social ties by strengthening communication links within the medical system, and externally with the beneficiary community, and both share existing knowledge and generate critical new information for decision-making. The model suggests that certain barriers, consisting of infrastructural, economic, technological, and socio-cultural factors, occur...
simultaneously, and in conjunction with each other, at both individual and social levels. While the present context has been examined previously (Chib, 2010; Chib et al., 2008), the focus here is an in-depth investigation of the benefits and barriers that women health practitioners face.

Benefits. ICTs can empower women in numerous ways if impediments to access and efficient usage are isolated (Nath, 2001; Sharma, 2003). First, women’s involvement in consequential decision-making processes, particularly about personal affairs, can then be catalyzed by the enhanced self-confidence gained through technology adoption (Oxaal and Baden, 1997). Further, Mijumbi (2002) found that women were better equipped to search for poverty-reduction opportunities, leading to greater autonomy in the social structure.

Secondly, a crucial ingredient for personal growth was knowledge gained through ICT usage. Women in ICT-based enterprises had enhanced capability to obtain information necessary to fulfill tasks, and make better choices when dealing with tough situations, which resulted in greater community respect (Duncombe et al., 2005). In addition, Henwood (1993) argues that women need to be producers of technology, as well as users, in order to regain control over male-dominated structures of creation and management (Ling, 2001; Thas et al., 2007).

Thirdly, ICTs entitle women to a larger share of the value-chain, formerly dominated by middle-men, thus transcending limitations imposed by class structures, location and culture (Davis, 2004). Such economic empowerment should improve the status of women through a process of psychological and social restructuring (Mehra, 1997). This process occurs both as a strengthening of internal self-esteem, as well as a more externally oriented weakening of traditional attitudes towards women (Gurumurthy, 2004; Hafkin, 2002).

Finally, scholars argue that ICTs can be used to ‘refine traditional gender roles’ (Kelkar and Nathan, 2002: 433), towards greater equality (Drucker, 2001). Thus ICTs not only promote practical efficiency and effectiveness in particular domains of experience, but provide a tool for strategic social transformation (Reeves and Baden, 2000). Various viewpoints emphasize women’s appropriation of power that go beyond the existing hierarchical control in society, a stance often ignored in technology diffusion projects. We suggest that a gendered frame of reference into the impact of ICTs should look

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**Figure 1.** ICTs for healthcare development model (Chib et al., 2008: 351).
beyond traditional socio-structural issues into examining dimensions of agency and autonomy in the negotiation of decision-making.

**Constraints.** Within the context of predominantly male-dominated societies, gender issues tend to be intermingled with social and organizational hierarchies, limited economic and educational progress, as well as constraints on physical mobility (Dunn and Dunn, 2006; Hafkin and Taggart, 2001). Technology, not being gender-neutral, cannot itself guarantee empowerment (Richardson et al., 2002). While the schism can be attributable partially to the absence of a gender lens in the design and implementation of technology projects, the reinforcing circle of deprivation and the technology divide poses significant problems. Further, some ICT projects, although targeted at women, not only do not foster gender equality (Rosser, 2005; Wajcman, 1991), but reinforce existing male-dominated socio-cultural structures (Maneja, 2002; Wood, 2001).

Structural constraints, such as a paucity of basic telecommunication infrastructure, inhibit the diffusion of technology. Even when available, facilities are concentrated in urban areas, while women, compared to men, tend more to live in rural areas. Furthermore, economic and physical restrictions limit women’s travel to urban ICT centers (Huyer and Mitter, 2003). With an inferior income and relatively few secure paid jobs, women are less likely to own household possessions, particularly precious technology items (Hafkin, 2002), or access fee-paying centers (Hafkin and Taggart, 2001). Although wireless technologies can act as substitutes (Jorge, 2002; Lee and Chib, 2008), their effectiveness is restricted by traditional hardware infrastructures. Socio-structural constraints begin early in a woman’s life-cycle, with inadequate educational opportunities, manifesting in a lower understanding of English (Elnaggar, 2007), the language predominately used on the internet, and in the absence of scientific literacy required for the contextual use of technology (Heeks, 1999). The high incidence of poverty therefore hampers the effective adoption of technology.

Socio-cultural barriers are often present and influential in family and community affairs. The multiple domestic, productive and community management roles women have in society (Rakow and Navaro, 1993), reduce leisure time and mobility to use public access facilities (Gurumurthy, 2004; Huyer and Sikoska, 2003). Social pressures and traditional cultural attitudes, based on gender biases, exist towards the female employment of technology. Notions of gender segregation extend to issues over access and control of ownership of resources. For example, the notion that girls are not as accomplished in science and technology as boys discourages academic advancement (Huyer and Mitter, 2003; Quaisie, 1996). Women are discouraged in professional practice, especially those married who struggle between domestic and work responsibilities (Hafkin and Huyer, 2006). Some cultures discourage their interaction with men in public, thus eliminating the potential of travel to mixed-gender ICT facilities.

While such analysis may yield insights, further refinement of the model is possible. A distinct conceptualization of benefits and constraints limits the understanding of resultant ICT effects because it fails to consider the agency of individuals. Besides considering the macro forces of infrastructure, economy, education and socio-culture, one needs to understand how individuals experience and react at a micro level. In this article, we align our arguments with feminist scholars (Foss and Foss, 2009) to position women...
mobile phone users as active agents who are able to maneuver through social constraints to reap benefits from ICT use. However, constraints and benefits are not static. To explore the role of female agency and power within the ICT4H model, we draw upon the theory of dialectical tension (Baxter and Montgomery, 1996), to guide understanding of the benefit-constraints dialectic.

**Theoretical framework**

The dialectical perspective is focused on uncovering tensions that result from oppositional pulls within various facets of social life. Instead of viewing any issue as static, this perspective posits that conflicting issues are constantly being renegotiated and redefined between parties (Rawlins, 1983). Contradiction refers to ‘the dynamic interplay between unified oppositions’ (Baxter and Montgomery, 1996: 8), defined in resistance to one another (e.g. fear-boldness), or coexisting within a unified system. Often viewed as negative, contradictions describe a natural process of redefinition and renegotiation that occur within and between social parties. Usually applied to interpersonal relationships, contradictions are evident with the introduction of ICTs to women, producing opposing tensions. As a woman attempts to incorporate mobile phone benefits into daily life practices, oppositional forces act as a restraint. Through struggling with dialectical tensions produced by shifting power dynamics, however, the woman may arrive at a novel position quite different from where she began (Townsend, 1999). Hence, this perspective is useful in circumventing the totalizing ‘either benefits or constraints’ approach to female empowerment, and examines the issue in its multi-faceted, complex entirety.

Therefore our first research question examines the benefits and constraints that occur with mobile usage from a gendered perspective, whilst the second investigates how women negotiate the resultant dialectical tensions that emerge.

**Method**

**Context**

The rural Indonesian province of Aceh, coupled with being a remote region recovering from a debilitating two-decades long civil conflict, suffered immeasurably from the devastating impact of the 2004 tsunami (Chalk and Rabasa, 2001). The inadequate health system lost a critical resource; the frontline CHWs, in the form of rural midwives (MWs). As a consequence standards of healthcare expertise on offer to scattered and remote rural communities deteriorated rapidly. An ICT4H intervention was implemented using mobile phones. The pilot project aimed to utilize mobile communications technology to develop a more responsive healthcare system to support MWs servicing rural communities.

The entire health system, consisting of MWs, MW coordinators (MWCs), and doctors was linked via mobile phones, which transferred data via a Java applet to an internet based database for handling information, accessible by a computing system installed at the hospital and clinics. Mobile use thus aimed to facilitate access to time-sensitive information by MWs, improve the quality of information accessible, create an information-sharing system within their hierarchical and peer networks, and allow tracking and collection of
critical health indicators. As suggested in the literature review, there was limited applicability of computer technologies to the MWs’ individual contexts: specifically, unavailability in remote rural areas, work mobility requirements, lack of computing expertise, and economic constraints. Hence this study focuses on the impact of mobile technologies only. To obtain details about the existing health system and technological infrastructure, and the World Vision program, refer to prior publications (Chib, 2010; Chib et al., 2008).

Procedures

The qualitative study was divided into three fieldwork phases conducted from September to December 2007. In-depth interviews and focus groups have been employed by researchers to understand people’s lived experiences and how they account for the daily events happening around them. Hence, focus group discussions (FGDs) and in-depth interviews were employed to gather data. Respondents were selected through multistage sampling, with health centers and villages randomly selected, from which different groups of participants were then randomly chosen. All responses were recorded by audio, and in the case of the FGDs, with video (to ensure accurate attribution during transcription). Transcription took place locally, while translation from Bahasa Indonesia was conducted twice, once by locals to capture slang in the vernacular, and then by Indonesian undergraduates at a Singaporean university for better rendering in English. All respondents received a gift hamper of basic foods as a mark of appreciation for participation.

Participants

In addition the health system participants, as ultimate beneficiaries of the use of ICTs, patients, and their families were also interviewed. For the FGDs, a total of thirty-five MWs, six MWCs, and nineteen villagers, were interviewed. For the in-depth interviews, seven MWs, four MWCs, six patients, and four villagers, were selected. Five doctors were interviewed to understand hierarchical issues. The primary respondents, MWs, were on average aged 29 years, ranging between 23 and 50 years old, and 43 percent had 6 years or less of experience. 12 percent of MWs had less than 2 years of experience, having been recruited to replace those lost in the tsunami. MWC ages ranged from 30–50 years old, while the patients and villagers ranged from 23–35 and 25–70 years old respectively. Respondent comments are provided to highlight the analysis; however, individual names have been withheld to protect identities.

Analysis

Examination began with reading through all transcripts at least once. Following this, methods of constant-comparison were employed (Glaser and Strauss, 1967; Strauss and Corbin, 1990). Data was compared amongst the accounts of MWs, but also between social and professional others, including doctors, villagers, patients and husbands. To illustrate, viewpoints of different participants were reviewed with the focus on gender. Such a method unmasked certain gender-specific issues that could have remained unobserved otherwise.
Special attention was paid to two areas, namely the specific benefits or constraints emerging from the MWs’ gender position, along with their reaction to the change. During the process of analysis, researchers came together several times to discuss and identify themes that contradicted or opposed one another. This process, guided by the ICT4H model and dialectical theory, yielded a picture of how MWs experienced, and behaved towards, these dialectical tensions. There were four major themes identified in this process that explain the dialectical struggles Acehnese women health practitioners face.

Findings

Midwives’ mobile phone use was found within the negotiation of the benefit-constraint dialectic. Dialectical tensions were categorized into two dimensions based on observations of the internal and external struggles experienced by the women. The psychological standpoint refers to the internalized norms a woman has in realizing the full benefits of the ICTs, while social hierarchy refers to the external societal pressure women face when using ICTs.

Psychological standpoint

Traditional and patriarchal gender expectations were internalized by Acehnese midwives, subsequently influencing their mobile phone use. In particular, women were caught in the struggle between autonomy and subordination; personal growth and limited technological competency.

Autonomy versus Subordination. There was widespread lack of consciousness about female subordination in relation to technology use. Nonetheless, mobiles allowed MWs to catch a glimpse of their autonomous potential. Realizing this, MWs utilized new strategies to enjoy autonomy by managing their fears of the perceived challenge of patriarchal control.

The needs of women in Acehnese society were often subordinate to the needs of men. Many MWs did not own a personal mobile phone, outside of the program. A MWC said, ‘I use my son’s mobile. [Patients] used to ask for the number … in case she fell sick in the middle of the night.’ In another interview, a MW wanted a mobile but later admitted, ‘Let my sons have it.’ Like many other participants, she experienced a struggle between admitting and suppressing her own desires. An internalized normative system induced her to deny personal needs, leading to a contradiction in feelings about the issue. Lack of ownership and possession was rationalized because MWs regarded mobiles as familial objects, with personal needs secondary. However, this view is problematic at two levels. First, patients explained that reaching the MWs through their husbands’ or sons’ mobile phones felt ‘uncomfortable’. Second, as one participant explained, the men were often ‘not at home’, leading to uncertainty in obtaining urgent medical care. Even so, legitimation of inequality via justification of male ownership was common.

On another note, midwives acquired some autonomy through the use of mobile phones. Previously, many MWs were limited by the lack of knowledge in handling complicated deliveries, with ‘problematic cases’ referred to hospitals because ‘they (MWs) are too scared to handle it’. Having mobiles allowed MWs to contact doctors or
coordinators for directions to help patients (Huyer and Sikoska, 2003). Midwives explained that mobiles made them ‘calm’, ‘confident’ and ‘relaxed’, giving them the boldness to make certain decisions which they dared not to previously. A midwife narrated the critical role of the mobile phone:

I had a patient. When I came, the openings were almost completed and the water had turned green. It was a high risk delivery. I couldn’t refer her anymore. I called Ms X (senior MW). When the baby came out, he didn’t cry; he had asphyxia. We thought he was already dead. The blood was all over my phone. I kept holding onto it. I called an ambulance.

Mobiles increased proficiency of MWs’ healthcare skills, translating to respect from the community. ‘We’ve become like opinion leaders, we sometimes feel embarrassed because we are still young, yet people respect us. Kids call us ‘Ma’am’; so do the elderly.’ With this new-found respect, MWs utilized strategies to incorporate, instead of challenge, the instilled subordinate position of women. The professional role of being a CHW diffused a part of the tension that arose from technology possession. Relegating mobile usage to professional work, rather than a form of personal ownership, was one legitimization strategy.

Myriad strategies were employed to enjoy the newly found autonomy while circumventing possible social repercussions, including sharing or hiding project phones. Some MWs lent their mobiles to others, even to the extent of taking up all the airtime credits, because they did not want to look ‘arrogant’. Another hid her mobile phone when meeting patients because ‘if I have a mobile phone but they don’t, it’s not nice.’

**Personal growth versus Limited technological competency.** Education and knowledge gain are key components of female empowerment. For Acehnese MWs, who often do not receive much higher education or formalized training, mobile phones became a crucial channel for personal growth. For instance, World Vision project managers periodically transmitted basic healthcare knowledge through short message service (SMS) broadcasts. More importantly, mobiles were an important tool in bridging physical distance and informal hierarchies, allowing MWs of different knowledge levels to connect. As one MW described it, ‘I will call my fellow colleagues who have a lot of experiences in baby delivery so we can discuss things.’

However, knowledge-building practices could be impaired by a lack of technological competency. At the outset, MWs were able to use only the basic call functions of the mobile phone. Despite having undergone training, MWs expressed an inability to use the application functions of the mobile phones. At first glance, this may be attributed to a high learning curve, as some confessed that they ‘forgot’ the training. Delving deeper, however, it is evident that gender played a part in the slow uptake of competency.

Midwives’ domestic and professional roles took a considerable part of their time, making it difficult for some of them to attend formalized training sessions. When one woman was asked whether she wished to attend such training sessions, she replied, ‘No, not yet, because I still have to take care of my child.’ The gender inequality in technology use and ownership meant that most women would have access to technologies slower than men, and this impaired women from learning the use of these technologies.
Despite such constraints, MWs were enthusiastic about learning new skills. They, for instance, volunteered to learn computing skills, despite being outside their job scope. However, the dialectical tensions between their desire to learn and the constraints to learning caused constant frustrations. MWs attempted to solve the problem by suggesting that ‘time constraints’ could be circumvented through flexible training sessions.

Social hierarchy

Socio-cultural and economic factors influenced the diffusion of ICTs amongst women. Midwives engaged in negotiating independence by over-riding economic considerations with personal satisfaction, and in appropriating power from the entrenched hierarchy.

Economic independence versus Constrained earning capacity. Economic constraints place women in a position of economic dependence, limiting their role in daily decision making and investment in personal growth. Despite the increased efficiency made possible by mobiles, MWs did not experience a corresponding monetary increase. It is possible that MWs found it difficult to increase fees for private consultation, as Acehnese suffered economically in the tsunami aftermath. Though specialized in female medical treatment, being female prevented MWs from getting the same pay as other healthcare practitioners.

Being desirous of greater earnings could also be perceived as a threat to the male-dominated economic hierarchy in the family structure. Further, as a MW said, ‘Husbands are the decision makers of the family because midwives get money from their husbands.’ This lack of financial independence also prevented the acquisition of higher education.

While the constraints in earning capabilities were a source of frustration, MWs did not struggle between the dialectical poles as much as accept them as facts of life. Although MWs desired increased incomes, they appeared nonchalant in achieving economic independence. Instead, helping others with their specialized skills provided a feeling of satisfaction and bestowed upon them professional dignity, with one saying, ‘We only get Rupiah 700,000 (~US$ 65) a month, but when we help people, we think about their life, and we hope to obtain merit from Allah.’

There is, however, the potential for economic independence in the long-run. As efficiency improves, MWs may attract greater numbers of patients, while charging increased fees, which could translate into increased earning power. Whether MWs would actively pursue economic strategies that, in effect, could threaten existing social hierarchies is debatable. Alternatively, it is likely that, given their subordinate positions in the existing social hierarchy, MWs would adopt legitimatization strategies to compensate for economic advancement.

Appropriation of power versus Hierarchical control. The use of mobile phones allowed MWs to appropriate power from doctors, by accessing informed advice. For example, many Acehnese believed that immunization jabs, being immediately followed by a fever, were a threat to children’s health. However, after MWs obtained information from doctors, families readily accepted the explanation. This indicates that power flowed down vertically, empowering women to influence decisions. Furthermore, village men recognized MWs connectivity to a hitherto inaccessible knowledge source. A villager said that if he
contacted the doctor, his ‘call would probably be ignored’. By using the midwife’s mobile phone, however, the doctor could ‘recognize the number’ and pick the call up.

Having access to doctors may, however, only provide a facade of power; a superficial gain easily removed with the termination of the mobile phone program. In reality, even gaining temporary access to power at the top was challenging. One MW said, ‘I consult with other midwives, but not directly with specialist. Sometimes the doctor takes a long time to pick up my call. I have to call a few times before they pick up.’ Sometimes these calls were ignored not because the doctors were busy, but because they simply could not bother to pick up MW calls. Even when doctors did answer, some of them may have replied in irritation. A senior MW described how she preferred talking to her ‘colleagues first’ because doctors sometimes provided ‘unsatisfying answers’ including ‘confusing’ remarks, making no attempt to help these MWs along in diagnosis or treatment application. Consequentially, many MWs spoke only to peers, limiting the potential appropriation of power.

Indeed, some doctors demonstrated negative attitudes towards these MWs. Although doctors acknowledged that MWs fulfilled important needs in communities, some remarks devalued their contribution, instead emphasizing their flaws. One doctor went into lengthy exposition about how MWs were covering up for each other’s laziness and that by ‘using the phone, sometimes she (the midwife) can lie about things. For example she lies about the blood pressure measurement because she hasn’t done it yet.’ Another doctor even ridiculed the MWs’ use of mobile phones, saying that ‘maybe she contacts her boyfriend.’ Project donors too were concerned about inappropriate personal usage of the mobile resource, and instituted a system with an airtime ceiling, yet such abuse was rarely found.

Although MWs struggled, largely unsuccessfully, to negotiate power within the healthcare infrastructure, the struggle itself produced a new form of internalized power. Having a mobile phone provided assurance that MWs could receive and provide help. This gave them the courage to handle difficult pregnancy cases. When successfully handled, MWs realized their own capability to help out in these difficult situations. One participant described heightened self-awareness that she could take on much more difficult tasks as a junior midwife, saying, ‘I’m still a junior, but they (the family) contact me and say patient is delivering. But delivery is usually handled by the seniors. I feel that patients trust me so I need to be confident.’ MWs directly benefited from the increased trust by the community, as their self-confidence increased. Over time, MWs’ self-empowerment should lead to empowerment within other domains as well.

**Discussion**

The use of the dialectical perspective provided insight into two areas. First, it highlights how benefits and constraints may interact and cause struggles in women’s lives. As the introduction of ICTs gradually makes women aware of their capability and potential (Townsend, 1999), they simultaneously become increasingly conscious of gender-specific obstacles (Dunn and Dunn, 2006; Hafkin and Taggart, 2001). These opposing forces cause struggles within their minds and manifest in their speech and behavior. Second, due to the struggles, outcomes from ICT implementation usually emerge in the middle ground, between the opposites of benefits and constraints, and are negotiated to a point of resolution. Table 1 summarizes the dialectical struggle women faced.
Table 1. Summary of the benefits, constraints and resolution of the dialectical struggle

<table>
<thead>
<tr>
<th>Themes</th>
<th>Benefits</th>
<th>Constraints</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomy vs Subordination</td>
<td>Opportunity to make decisions</td>
<td>Denial of women’s needs</td>
<td>Used strategies to legitimatize benefits and acknowledge</td>
</tr>
<tr>
<td></td>
<td>Realization of usefulness of mobile phones</td>
<td>Masked inequalities</td>
<td>constraints</td>
</tr>
<tr>
<td>Personal growth vs Limited technological competency</td>
<td>Mobile phones provide learning material</td>
<td>Domestic role limits time for training</td>
<td>Attempted to work around the limitations of time</td>
</tr>
<tr>
<td></td>
<td>Discuss and share knowledge</td>
<td>Low access to technology</td>
<td>Used informal learning groups</td>
</tr>
<tr>
<td></td>
<td>Increased efficiency in profession</td>
<td>Fear to speak up Generalized poverty</td>
<td>Potential long-term gains</td>
</tr>
<tr>
<td>Economic independence vs Constraints earning capabilities</td>
<td>Access to power at top</td>
<td>Lack of appreciation for profession by outsiders</td>
<td>Economic gain put aside for gain in dignity and self-</td>
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<tr>
<td></td>
<td>Recognition of power by outsiders</td>
<td>Increased expenditure</td>
<td>respect</td>
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<tr>
<td>Appropriation of power vs Hierarchical control</td>
<td></td>
<td>Difficulty to appropriate power</td>
<td>Self-empowerment</td>
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<td></td>
<td></td>
<td>Reluctance to even out hierarchical power</td>
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One must note that an interpretive research project like this one does not claim its finding to be true in all developing countries. Rather, good qualitative research should place ‘an emphasis on the heterogeneity and contextuality of knowledge, with a shift from generalization to contextualization’ (Kvale, 1996: 232). It is done by paying attention to the specificity of different individuals, communities and context. An important caveat is that we have consciously avoided an emphasis on the orthodox Shariah nature of Acehnese Islamic identity, being careful to not suggest that this is a particular case of female subordination. Rather these findings should enhance understanding of mobile technology implementations in developing countries where the social status of women and technology infrastructure were similar to the current study.

**Women’s struggle with ICT use**

The findings revealed that gender inequalities can remain masked until gradually revealed by ICT implementation. Consistent with previous findings, MWs gained self-confidence through the use of mobile phones (Huyer and Sikoska, 2003). They came to realize that not only do mobile phones improve professional efficiency (Mijumbi, 2002), they help garner respect within local communities (Duncombe et al., 2005). However, with the rising consciousness of potential capabilities, prevailing gender-specific forces resisting such improvements have also become more evident.

The meeting of oppositional forces resulted in frustrations and concerns. While some women exposed their frustrations at dealing with gender prejudice, others devised strategies to alleviate concerns upsetting the prevailing male-dominated hierarchy.
Reactions, therefore, happen at two levels. While some confronted gender prejudice, others attempted to assimilate their new-found power into existing social hierarchies (Patel and Parmetier, 2005).

Hence, researchers and policy-makers need to be aware of the real tensions that could arise out of ICT projects. As noted in the article, empowerment in women is not only wholly beneficial or constrained, but also results in frustrations and tensions across multiple levels. These tensions, while uncomfortable at first, may be an important first step in transforming traditional gender roles (Townsend, 1999).

**Process of resolution**

The outcomes of ICT implementations never exist as pure benefits or constraints. It is critical to take into account how the participants themselves, in this case, MWs, can influence outcomes (Baxter and Montgomery, 1996; Townsend, 1999). The findings show that at least two areas must be considered during the resolution process; the resourcefulness and the desires of women.

**Resourcefulness of subjects.** Resourcefulness refers to the ability and willingness of women to devise interesting means in overcoming constraints. The analysis found that MWs were active agents capable of dealing with the difficulties presented by their gender. This does not mean that access to mobile phones gives women the power to resist the gendered constraints in their society. Women did not wield major control over their societal constraints, but they utilized resources to find solutions to their problems. For instance, when faced with societal norms limiting their use of mobile phones, MWs devised excuses and strategies to legitimize their continued usage of mobile phones (Patel and Parmetier, 2005), particularly within their professional roles. To do so, these women utilized their social networks and understanding of social norms. These two resources were of importance in generating deviant solutions to their problems. While the constraints were not directly confronted, resourcefulness allowed individuals to maneuver around problems and absorb benefits. However, we note that a broader generalization of the negotiation process is problematic, as handset use was legitimated for professional usage. Whether this would occur for all females, in the absence of a specialist role, requires further investigation.

**Desires of subjects.** To understand the outcomes of ICT implementation, one also needs to value the desires of the subjects (Townsend, 1999). In some cases, the aims of researchers and policy-makers may not coincide with their subjects, or beneficiaries, leading to alternative outcomes. For instance, one measure of the project was to foster greater financial independence. Since financial independence could improve the dignity of women, as well as their profession, this was thought to be a clear indicator of empowerment. However, the analysis reveals that understanding of female dignity was based not on an economic indicator, but rather, the humanitarian services rendered to their own communities.

In another instance, MWs did not appropriate power from doctors partly because they did not see themselves as needing to express power over the men. Instead, their concerns were more practical; they wanted to feel competent so that they could handle difficult childbirths better (Duncombe et al., 2005). Thus, even though MWs did not appropriate hierarchical power, the inner empowerment developed left them highly satisfied.
Conclusion

The ICT4H model performs adequately as an analytic frame, but can be critiqued for denying an active role to the agent, thus veering towards a form of technological determinism. To understand the agency of women ICT users in a developing country context, we echo the standpoint of ‘power feminism’ introduced by Foss and Foss to communication studies (Rowe, 2009).

This standpoint moves away from the earlier rhetoric of oppression, to argue that an individual’s consciousness of their own social position in relation to the environment empowers them to gradually create a desirable world (Foss and Foss, 2009). The dialectical framework thus offers insights into how Acehnese midwives are able to understand their own gendering and empowering process, albeit within a technology implementation program, beginning a journey into questioning their role as women in society, and to realize their own agency.

Hence, the present analysis offers the dialectic frame as an improvement to the ICT4H model, bringing in the notion of an internal self-empowerment process as a means of achieving sustainable social change. However, to have agency is not necessarily to be empowered. Women as independent entities have to confront and overcome their own ingrained subordination for empowerment to be realized; current gender-consciousness is less than adequate to nurture such strategies. Thus technology implementation, beyond engaging participants within a community, requires astute strategic management (Lee and Chib, 2008).

Project designers have to integrate women’s practical needs with strategic concerns to transform the existing social hierarchy, as well as successfully conduct gender-neutral projects. Transforming theory into praxis by understanding the dialectic process, one can consider whether influencing the negotiation process could facilitate ICT implementation. Instead of seeing constraints as immediate obstacles requiring resolution, a preliminary step may acknowledge these as problems to be maneuvered around. Further, greater effort can be spent to convince women that the ICT implementation program is a worthwhile venture, not merely from the narrow development objective of the donor, but as a tool for social transformation. This would, in turn, spur them to tap into the resources present both internally, and in their communities. The negotiation process of gender empowerment, hence, could be targeted as a component in a holistic ICTD program.

Note

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