



<http://www.diva-portal.org>

This is the published version of a chapter published in *ICT for Anti-Corruption, Democracy And Education In East Africa*.

Citation for the original published chapter:

Alissandrakis, A., Milrad, M. (2013)

Designing interactive mobile services to promote civic participation in northern Uganda.

In: Katja Sarajeva (ed.), *ICT for Anti-Corruption, Democracy And Education In East Africa* (pp. 53-65). Stockholm: Stockholm University

Spider ICT4D Series

N.B. When citing this work, cite the original published chapter.

Permanent link to this version:

<http://urn.kb.se/resolve?urn=urn:nbn:se:lnu:diva-36729>

Designing Interactive Mobile Services To Promote Civic Participation In Northern Uganda

Aris Alissandrakis

Department of Media Technology, Linnaeus University

Marcelo Milrad

Department of Media Technology, Linnaeus University

ABSTRACT

This chapter presents the activities and outcomes of the project called “People’s Voices: Developing Cross Media Services to Promote Citizens Participation in Local Governance Activities”.

The aims of the project were as follows: a) To identify and describe a number of cross media services that can be used to promote citizens’ participation in political decisions and civic activities, and b) To develop a conceptual design and a prototype system of such a service. The project included a number of field trips from Sweden to Uganda, used participatory design and ethnographic techniques for requirements elicitation, actively involving the different stakeholders. The developed system allows people in Uganda to use their mobile phones with an interactive voice menu interface to submit reports of poor service delivery or irregularities in local governance.

We hope that our contribution will emphasize how novel ways of integrating and using ICT can provide opportunities to encourage and facilitate civic engagement in North Uganda. The potential massive adoption of the kind of interactive mobile services described in this chapter can allow this technolo-

gy to be used in unique ways to provide opportunities to make governmental services more innovative, transparent and cost-effective, as well as to encourage citizens to become more engaged and goal-focused for the common good of their society.

The project was partially funded by the Swedish Program for ICT in Developing Regions (Spider) and was a collaboration between the Center for Learning and Knowledge Technologies (CeLeKT) at Linnaeus University (LNU, Sweden), the Women of Uganda Network (WOUGNET), and Makerere University (MAK, Uganda).

INTRODUCTION

The current chapter presents the outcomes from the ICT4D research project “People’s Voices: Developing Cross Media Services to Promote Citizens Participation in Local Governance Activities” carried out by CeLeKT.

The motivation behind the “People’s Voices” project was related to an ICT4D project carried out by WOUGNET in North Uganda, called “Empowering Local People and Communities to Monitor Districts Services Delivery through ICTs” (funded by Spider). The WOUGNET project was launched in the five districts of Amuru, Gulu, Oyam, Kole and Apac in September 2011. Since then a number of activities took place, including ICT capacity building workshops in the different districts, and orientation of project participants (Voluntary Social Accountability Committees, VSAC) in how to use mobile phones to send SMS messages to report poor service delivery and irregularities in local governance to the respective authorities. These participants were also instructed in how to use digital cameras for taking pictures as evidence of their concerns, and how to use computers.

These different awareness-raising activities have created excitement, especially among women who had not thought of owning and using a mobile phone. As a result, a number of them have since acquired their own phones and use them to report cases of poor service delivery. A website using the Ushahidi¹⁵ web platform is used to show these reports across the five districts. WOUGNET is also using more traditional media to inform about the project, including newsletters, articles in newspapers, and involvement in a radio talk show.

Despite these ongoing efforts, members of WOUGNET had identified a number of challenges. These included limited awareness of the benefit of using ICT, especially mobile phones, in disseminating information. The isolated use of the different types of traditional media to empower the local communities in fighting corruption seemed to lead to a waste of resources. This was mainly attributed to the lack of ICTs (e.g. few mobile phones amongst many), high levels of illiteracy in the community and low level of ICT skills,

¹⁵ <http://www.wougnet.org/ushahidi/>

and appropriate sensitization on the need to combat corruption through community monitoring. Therefore, the isolated use of ICT tools within Northern Uganda's districts has not had a substantial impact on reducing corruption within the local communities. Another related problem lies with strong cultural norms and practices that still limit the usage of ICTs, especially among women.

Megwa (2007) points out that although some organizations have launched different initiatives to counter the digital disparities between urban and rural areas in South Africa, most of the attempts tended to introduce more and more ICT hardware to rural areas instead of looking for creative ways to expand ICT access to benefit poor and rural communities. Guided by such observations, for the "People's Voices" project we wanted to repurpose and reuse existing technologies rather than introduce new ones.

The rest of the chapter is organized as follows: Section 2 presents the project research aims and objectives, while Section 3 describes the methodological approach that was followed. In Section 4 we describe the activities that took place, and Section 5 describes the conceptual design and the prototype that were developed based on the requirements we identified during our field trip in the summer of 2012. Section 6 describes the testing and validation of the prototype in the summer of 2013, and finally in Section 7 we present our conclusions.

RESEARCH AIMS AND OBJECTIVES

The objective of the related WOUGNET project was to empower local people and communities to monitor district service delivery through a combination of different ICT-based tools and traditional media.

Many initiatives in Uganda and other nations have focused on supporting civic participation. It appears that such efforts do indeed improve the quality of public service delivery (Deininger and Mpuga, 2005). Additionally, the use of ICT for the purpose of improving public service delivery (Zanello and Maassen, 2011) and fighting corruption (Grönlund, 2010) has shown promising potential. ICT is applied in various ways with the hope of improving transparency and fighting corruption, especially in sub-Saharan Africa (Heacock and Sasaki, 2010). According to a white paper by Barkat et al. (2011), the use of a combination of inexpensive and widely available tools and social media can empower citizens to organize themselves and to improve their civic responsiveness.

The use of "cross-media" to empower the local communities in monitoring and reporting corruption has a considerable impact on community development. Cross-media refers to interactive experiences across multiple media, including the Internet, video, cable TV, mobile devices, print and radio. The new media aspect of the "cross-media experience" typically involves a high level of audience interactivity (Davidson et al., 2010).

Thus, the research question that guided our efforts in the context of the “People’s Voices” project was as follows: What are the potentials of using cross-media services for supporting and empowering the people of Uganda in order to increase their civic engagement?

In particular, co-design and interactive techniques (Benyon, 2013) involving different stakeholders were used to identify the needs for the design of such interactive services. The project brought researchers and master’s students from LNU and MAK together with different actors from WOUGNET in order to achieve the following objectives:

- Identify and describe a number of cross-media services that can be used to promote citizens’ participation in political decisions and civic activities.
- Develop a conceptual design and a prototype system of such a service.

RESEARCH METHODS

An important aspect of the work that was conducted in this project deals with technology and service design, especially interactive services. We explored new solutions and ways to modify or improve existing methods to include the creation of cross-media services to support civic engagement. We applied exploratory and iterative approaches that involved a number of concurrent and interlinked activities that included:

- Generation of concepts
- Design and assessment with the different stakeholders
- Refinement of concepts
- Creation of prototypes

Design-based research is an attempt to combine the intentional design of interactive environments with the empirical exploration of our understanding of those environments and how they interact with individuals (Hoadley, 2004). Dourish and Button (1998) refer to the term “technomethodology”, which is closely related to our interest in using qualitative social science methods represented by participatory design and ethnography together with technology design.¹⁶

The team consisted of researchers from the fields of computing, information and media technology, software development, as well as members of the WOUGNET team. These stakeholders contributed in different ways to the knowledge base that guided and scaffolded the process of collaborative design (as it cannot be expected that each individual team member should be acquainted with all aspects of the knowledge base). The discussions and negotiations between the team members were guided by scenario-based design (SBD, Rosson and Carroll, 2002) as it is a methodology based on narratives that enable rapid communication about usage possibilities and concerns among many different stakeholders (Penuel et al., 2007).

¹⁶ For a comprehensive guide to interaction design see (Benyon, 2013; Beyer and Holtzblatt, 1998).

The methods used for analyzing the different communication processes and their implication for the design of the cross-media services were partially ethnographical. We used field notes, captured voice, and video recordings of dialogues with different stakeholders, and conducted interviews and observations that were connected to authentic situations. The aim of using such ethnographic methods has to do with “coming closer” to different situations in real settings, find out “how communication is taking place”—how artifacts are used, what the interaction between the participants looks like, and so on. In the next section we present an overview of the different project activities that took place between the period of spring 2012 and late summer 2013.

PROJECT ACTIVITIES

In the initial phase of the project (starting in the spring of 2012), the research team carried out an analysis of the ongoing efforts by WOUGNET as well an investigation of the technological feasibility and practicality of the project objectives mentioned in Section 2. Regular online meetings took place between the Sweden and Uganda teams, to discuss and work together. The outcomes of these efforts lead to an initial identification of requirements that could be used to guide our future developments. A web-based repository was established for project members to share documents and relevant scientific publications.

Following an identification of needs and a feasibility study, a team of two researchers and four master’s students from LNU traveled to Uganda in the summer of 2012 for a period of two weeks, visiting Kampala as well as the Apac, Oyam and Gulu districts. The team met with the academic partners from MAK and WOUGNET representatives. During the trip to the three northern districts, several members of WOUGNET, as well as a master’s student from MAK, accompanied the group from LNU. The purpose was to conduct field trips in order to get a deeper understanding of the problem domain, as well as to carry out the requirements definition. In each of the three districts an interactive design workshop took place (see Figure 1), together with the different stakeholders (these included members of WOUGNET, VSAC, and local people, totaling more than 150 persons). In addition to these workshops, the local radio station at Apac was also visited, to explore some further cross-media possibilities.



Figure 1. Photos from the workshops during the first trip to Uganda. Photos by LNU, Media Technology Department.

During fall 2012 and spring 2013, a conceptual design was developed. Guided by the analysis of the data collected in the field and the continuous interaction with our colleagues in Uganda, we embedded user needs into the design and implementation of interactive mobile services. Given the component identification, a conceptual design and a prototype were developed and implemented. Both will be described in more detail in Section 5.

Finally, in the summer of 2013, a follow-up trip to Uganda took place, in order to test and validate the functionality of the prototype. Two master's students from LNU (supported by a third master's student working remotely) traveled to Uganda for a period of three weeks and engaged in activities related to the deployment of the system (see Figure 2). They were mainly stationed in Kampala (where they worked closely with WOUUNET), and visited four districts (Oyam, Gulu, Amoru and Apac). More details about this trip will be presented in Section 6.



Figure 2. Photos from the second trip to Uganda: (Left) training WOUUNET staff on how to use the system, (Middle, Right) workshops to test and evaluate the system. Photo by Lars Lorenz.

CONCEPTUAL DESIGN AND PROTOTYPE

During the initial workshops conducted in Uganda in August 2012, the participants were asked to describe some “typical” report cases, actual events that took place and that fell under the categories of governance irregularities or poor service delivery. The participants explained how these were reported (and for some cases how these were resolved), what kinds of ICT (if any) were used in order to do so, and—in the cases that did not involve ICT—how they would imagine using ICT to report and resolve those cases. Having an overview of the type of cases at each district, some representative ones were chosen and a number of group interviews were conducted for more information. Examples included lack of staff or resources in schools and medical centers; people charging for services or equipment that should be free (like a donation of bicycles), or not delivering contracted work for the communities (leaving buildings and roads unmade or with problems).

The collected data after that first field trip (notes, audio and video) allowed the synthesis of a “super case” that combined as many of the characteristics as possible, and helped to define both requirements and limitations for a possible solution.

The proposed interactive mobile service should fulfill the following requirements:

- Be free, in order to encourage people to use the service and make reports. The high cost of telephone services in the region was noted.

- Be easy and intuitive to use, requiring very little training.
- Be accessible over the existing ICT infrastructure available in the region. As mentioned above, we avoided introducing new technologies, but instead took advantage of existing (and familiar) ones.
- Preferably use voice as the main channel to collect, deliver and interact with information, instead of text (such as SMS), due to high levels of illiteracy among the local population.
- Allow the dissemination of important information to a wide audience. One of the main problems in the rural areas is the lack of communication infrastructure, and the resulting lack of information is allowing incidents of bad governance and poor service delivery.

Following the above-mentioned requirements, a conceptual design of a solution that would be a combination of Content Management System (CMS) with Interactive Voice Response (IVR) was proposed. This approach would allow WOUGNET to collect reports via mobile phones from the local people, and also disseminate information back to the community through the same channel. Already at this stage, we identified that our initial ideas of combining and connecting traditional radio channels with mobile communication could instead be deployed by using IVR technology and mobile devices.

A typical scenario from a users' perspective would involve making a call with a mobile phone to a toll-free number, and going through an interactive voice menu to either report (record) a new case, or listen to existing ones in the system. A database of cases submitted by the local people would be available to WOUGNET personnel for their own activities (e.g. updating their Ushahidi website) but also to approve and make them available back through the same service. By using existing mobile phones, at no cost, not involving the use of text but rather voice (with a few key presses to navigate the menu) we hoped to make the service accessible for widespread adoption and empower the local people and communities. This specific way of interacting with mobile services using voice was guided by the requirements specified above. However, obtaining a toll-free line number in Uganda had proven very difficult in practice, and also did not meet some of the technical requirements for connecting with the server. The solution was to emulate a toll-free line so that the caller does not have to pay for the service.

After examining a number of available technological options we chose two off-the-shelf technologies for creating a prototype that would allow such a scenario, these were Drupal¹⁷ (in particular the VoIP Drupal¹⁸ module) and Tropo¹⁹ (see Figure 3). Revisiting the scenario above, a person with a mobile

¹⁷ Drupal (<http://drupal.org>) is an open source CMS system commonly used for websites and applications.

¹⁸ VoIP Drupal (<http://drupal.org/project/voipdrupal>) is a framework that allows the use of voice and Internet Telephony with Drupal.

¹⁹ Tropo (<http://www.tropo.com>) is a Cloud Application Program Interface (API) for Voice and SMS.

phone calls a local number. This number belongs to an Android mobile phone (“mobile server”) located at the WOUNET offices in Kampala. The mobile server rejects the call (busy signal), and forwards the caller’s phone number (via the Internet, connected by WiFi) to the “server”, located at LNU in Sweden. The server forwards once again the caller’s phone number, along with an appropriate voice menu script (created by the “reporting system”) to the Tropo cloud service, which then makes a call back to the caller’s mobile phone. Answering the returned call provides access to the voice menu (see Figure 4).

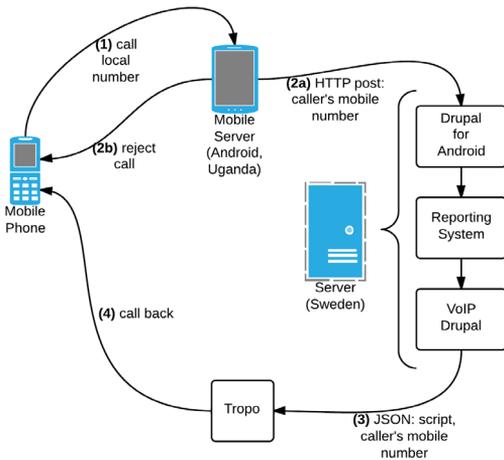


Figure 3. An overview of the system components and the communication between them.

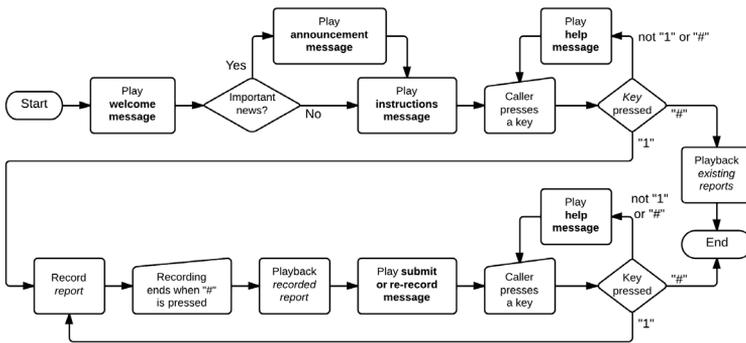


Figure 4. The voice menu.

The voice menu was designed following the model of IVR interfaces for low literacy users proposed by Sharma Grover et al. (2009). The caller is guided step-by-step, using touch-tone input (pressing keys on the phone keypad) instead of voice recognition, and is provided assistance if a wrong (invalid) key is pressed.

After an initial welcome message, an optional announcement message (e.g., an important message by WOUGNET) can be played. Instructions on how to use the system follow: if the “1” key is pressed the caller can record a report, if the “#” key is pressed the caller can listen to existing reports in the system. If neither of these two keys are pressed, an input error is assumed, and the caller can try again after listening to a help message. In order to conserve system resources, retries are limited to up to three times. After recording a report, this is played back, and the caller has an option to either submit or re-record.

TESTING AND VALIDATION

In July of 2013 a team of two master’s students from LNU travelled back to Uganda for a period of three weeks, to test and validate the prototype. The team was mainly stationed in Kampala. A mobile phone with a local SIM card was obtained, and the mobile server software (see Figure 4) was installed. This particular “mobile server” phone was placed at WOUGNET’s office in Kampala, with WOUGNET being responsible for keeping it charged and connected to the Internet (via WiFi). Members of WOUGNET were trained in how the system works and how to use it. After a number of initial tests to make sure the system worked as intended, the team visited four districts (Oyam, Gulu, Amoru and Apac) and conducted workshops to make sure the prototype worked in the field too.

The objectives of these workshops were two-fold: on the one hand we wanted to allow VSACs to get familiar with the interactive services, and on the other hand we wanted to validate whether the provided functionality would match people’s expectations based on the requirements identified in the previous phases.

Overall, during these workshops, the participants (in total around 30 members of VSAC) found no major difficulties in how to use and interact with the system. Some of the participants even started using it straight away to generate new reports, providing some encouraging indications about the potential added value of this type of interactive mobile service.

Apart from these initial promising outcomes, a number of important observations were made during this testing period:

- Electricity and Internet access could not be taken for granted, not even in the capital city of Kampala. Extended blackouts (some lasting days) were, unfortunately, rather frequent. Given that the mobile server needs to be charged and with continuous Internet access, the availability of the service cannot be guaranteed. If someone tries to use the service during a blackout, that call is lost.
- Rather unexpectedly, the quality of mobile phone services in Kampala is worse than in the northern rural areas. Possibly due to network overload problems, calling and reaching the wrong phone number by accident is rather common. This can have implications when the system

tries to call back. The issue was confirmed both from system logs and from private communications with the Uganda team.

- It is common for people to have their voice mailboxes on their mobiles activated to answer all incoming calls. This can interfere with the call-back from the system, and they would need to be aware and deactivate this feature.
- The voice menu is currently only in English; language options were requested, as this kind of feature is typical for automated phone systems in Uganda.²⁰
- There was interest expressed in adding a geo-location feature, in order to associate a place with the report.
- Many raised concerns regarding anonymity, and also the possibility that their data (reports and means to identify them) would fall into the wrong hands.

CONCLUSIONS

Research within the field of ICT4D is a relatively new area that has gained a lot of attention in the last 7 years. The series of International Conferences on Information and Communication Technologies and Development (ICTD) started in 2006 and since then it has been attracting researchers from almost all over the world working in the field. An overview of the research efforts described in the conference proceedings from ICTD [2006-2012] indicates that not many efforts (Bussell, 2009; Gigler, 2009) have been carried out in the particular line of research described in this chapter. Gomez et al. (2012) provide insights about the trends and directions in the field by doing a comprehensive analysis of the ICTD literature across multiple sources over the last ten years. While looking specifically at the research efforts carried out in Uganda and reported in these proceedings, a few can be identified in the field of ICT for health care, agriculture and banking (Ho et al., 2009; Futterman and Shuman, 2010; Ghosh, 2012).

For our project, we used participatory design and ethnographic techniques for requirements elicitation, actively involving the different stakeholders. An interactive mobile service was developed and tested, that allows people in northern Uganda to submit reports of irregularities in local governance or poor service delivery.

The results of the “People’s Voices” project contributes to the ongoing scientific discourse in the field of ICT4D about how ICT and well-informed design can help less privileged people and marginalized communities across the world to benefit from technological developments to improve the quality of their lives. In particular, we hope that our specific contribution will emphasize how novel ways of integrating and using ICT can provide opportunities to encourage and facilitate civic engagement in North Uganda. We can sum-

²⁰ English is one of the official languages, but there are over forty languages used, including Swahili and Luganda (mostly in and around Kampala).

marize by stating that the outcomes emerging from these efforts provided us with a better understanding of how interactive mobile services in countries with non-standard ICT infrastructure should be guided by the needs and the contextual settings in which they should be used.

The potential of widespread adoption of the kind of interactive mobile services described in this chapter can be used in unique ways to provide opportunities to make governmental services more innovative, transparent and cost-effective, as well as to encourage citizens to become more engaged and goal-focused for the common good of their society. As described in the introduction, the ICT infrastructure available in the community, in particular mobile phones and Internet, can be utilized in new ways to facilitate the reporting of cases of bad governance and poor service delivery. The reduction in costs of services afforded by the use of different ICT solutions within the country can lead to easy acquisition by the people and hence can be used to monitor and report corruption.

ACKNOWLEDGMENTS

The project was partially funded by Spider (further assisted by Spider student travelling grants in 2013), and was a collaborative effort between CeLeKT, WOUGNET, and MAK.

The authors would like to thank Asreen Rostami, Valeriy Saviov, Lars Lorenz and Juan Tomás Rodríguez Rodríguez (LNU), Montathar Faraon (Södertörn University, Sweden), Dr. Jude Lubega, Dr. Rehema Baguma, and Agaba Issa Mugabo (MAK), and Goretti Zavuga Amuriat (WOUGNET).

REFERENCES

- Barkat, H., Jaeggli, L. and Dorsaz, P. 2011. Citizen 2.0: 17 Examples of Social Media and Government Innovation. [online] Available at: <http://citizen20.redcut.ch/> [Accessed September, 2012]
- Benyon, D. 2013. *Designing Interactive Systems: A Comprehensive Guide to HCI, UX and Interaction Design* (3rd ed.). London: Pearson Education.
- Beyer, H. and Holtzblatt, K. 1998. *Contextual Design: Defining Customer-Centered Systems*. San Francisco: Morgan Kaufmann.
- Bussell, J. 2009. Political incentives and policy outcomes: Who benefits from technology-enabled service centers? In *Proceedings of the 3rd International Conference on Information and Communication Technologies and Development (ICTD 09)*. IEEE Press, Piscataway, NJ, USA, pp. 173-182.
- Davidson, D., et al. 2010. *Cross-Media Communications: An Introduction to the Art of Creating Integrated Media Experiences*. Pittsburgh, PA: ETC Press.
- Deininger, K. and Mpuga, P. 2005. Does greater accountability improve the quality of public service delivery? Evidence from Uganda. *World Development*, 33(1), pp. 171-191.
- Dourish, P. and Button, G. 1998. On "Technomethodology": Foundational Relationships between Ethnomethodology and System Design. *Human-Computer Interaction*, 13(4), pp. 395-432.
- Futterman, N., and Shuman, R. 2010. AppLab Question Box: A Live Voice Information Service in Rural Uganda. In *Proceedings of the 4th International Conference on Information and Communication Technologies and Development (ICTD 10)*. ACM, New York, NY, USA.
- Ghosh, I. 2012. The mobile phone as a link to formal financial services: Findings from Uganda. In *Proceedings of the Fifth International Conference on Information and Communication Technologies and Development (ICTD 12)*, ACM, New York, NY, USA, pp. 140-148.
- Gigler, B.S. 2009. Decentralization, Clientelism and Popular Participation - Is There a Role for ICTs to Improve Local Governance? In *Proceedings of the 3rd International Conference on Information and Communication Technologies and Development (ICTD 09)*, pp. 267-279.
- Gomez, R., Baron, L. F. and Fiore-Silfvast, B. 2012. The changing field of ICTD: Content analysis of research published in selected journals and conferences, 2000-2010. In *Proceedings of the 5th International Conference on Information and Communication Technologies and Development (ICTD 12)*. ACM, pp. 65-74.
- Grönlund, Å. 2010. Using ICT to combat corruption: tools, methods and results. In: C. Strand, ed. *Increasing Transparency & Fighting Corruption Through ICT* (Spider ICT4D Series), 3, pp. 7-31.
- Heacock, R. and Sasaki, D. 2010. Information and Communication Technology for Transparency in Sub-Saharan Africa. In: Strand, C., ed, *Increasing Transparency & Fighting Corruption Through ICT* (Spider ICT4D Series), 3, pp. 33-44.
- Ho, M., Owusu, E. and Aoki, P. 2009. Claim mobile: engaging conflicting stakeholder requirements in healthcare in Uganda. In *Proceedings of the 3rd International Conference on Information and Communication Technologies and Development (ICTD 09)*, pp. 35-45.
- Hoadley, C. 2004. Methodological alignment in design-based research. *Educational Psychologist*, 39(4), pp. 203-212.
- Megwa, E. R. 2007. Bridging the Digital Divide: Community Radio's Potential for Extending Information and Communication Technology Benefits to Poor Rural Communities in South Africa, *Howard Journal of Communications* 18 (4) , pp. 335-352.

Penuel, W.R., Roschelle, J. and Shechtman, N. 2007. Designing formative assessment software with teachers: An analysis of the co-design process. *Research and Practice in Technology Enhanced Learning*, Vol. 2, No. 2, pp. 51-74.

Rosson, M.B. and Carroll, J.M. 2002. Scenario-Based Design. In Jacko, J., & Sears, A (Eds.): *The Human-Computer Interaction Handbook: Fundamentals, Evolving Technologies and Emerging Applications*, 1032-1050. London: Lawrence Erlbaum Associates.

Sharma Grover, A, Stewart, O and Lubensky, D. 2009. Designing interactive voice response (IVR) interfaces: Localisation for low literacy users. In Proceedings of the 12th *IASTED International Conference on Computers and Advanced Technology in Education (CATE)*, St. Thomas, Virgin Islands, November 2009, pp. 673-029.

Zanello, G. and Maassen, P. 2011. Strengthening citizen agency and accountability through ICT. *Public Management Review*, 13(3), pp. 363-382.