

Doctoral Colloquium

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*Adoption of Information Communication Technology for Development (ICT4D) and Poverty Reduction
in a conflict zone: A Zimbabwean Case*

**ADOPTION OF INFORMATION COMMUNICATION TECHNOLOGY FOR
DEVELOPMENT (ICT4D) AND POVERTY REDUCTION IN A CONFLICT
ZONE: A ZIMBABWEAN CASE**

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ADOPTION OF INFORMATION COMMUNICATION TECHNOLOGY FOR DEVELOPMENT (ICT4D) AND POVERTY REDUCTION IN A CONFLICT ZONE: A ZIMBABWEAN CASE

OVERVIEW

This thesis adopts the Capability Approach as a framework for evaluating development, and draws upon Technology Adoption and Diffusion theories to develop an ICT4D adoption strategy for Zimbabwe in a Participatory Approach framework (Sen, 1999; Melkote, 2001; Ojo, 2004; Alampay, 2006; Alkire and Deneulin, 2008). This approach challenges the prevailing technological deterministic and modernisation theory inspired approaches that are often blamed for Africa's failed projects and escalating debt burden. This failure is said to be due to putting the technological cart before key issues like human capacity, opportunities and access to education and health, which are prerequisites of ICT4D adoption (Ojo, 2004; 2005, Mhlanga, 2006).

At a time when other developing countries are adopting ICT4D, the country specific issues that determine its success in Zimbabwe need to be investigated. Zimbabwe is facing unprecedented economic decline and deepening poverty due to political conflict. This fuels brain drain and dependence on remittances and may lead to years of lost opportunity for growth and recovery. Formulating this ICT4D adoption strategy also demonstrates how to address the problem of wrong approach to ICT4D adoption and attempts to show how ICTs can address deepening poverty in Zimbabwe.

Expected Contribution to Knowledge

The proposed thesis makes its contribution by developing an ICT4D adoption strategy for Zimbabwe through an application of Capability Approach and Technology Adoption Models to ICT4D research by addressing the following research question:

Research Question

How can ICTs be harnessed to facilitate expansion of people's capabilities (effective opportunities) in rural Zimbabwe if it is possible?

Sub-questions

1. What economic activities do the people engage in and aspire for in order to combat recurrent poverty and underdevelopment in Zimbabwe?

2. What skills and infrastructure are available and what skills are required in order to enable people to use ICT for poverty reduction and development endeavours in Zimbabwe?
3. How can ICTs assist the poor to receive remittances and participate in mainstream economic activities?
4. What is the current use of ICT and what is the scope for further adoption?

Research methodology and Conceptual framework employed

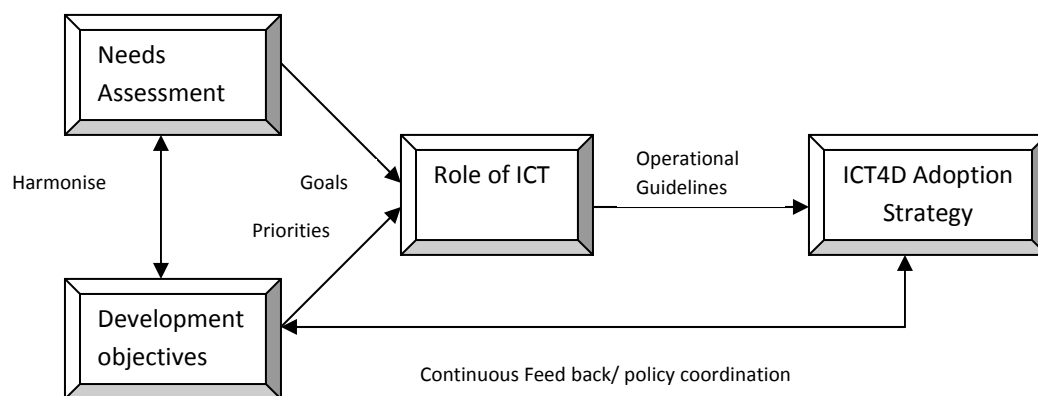


Fig 1. ICT4D Adoption Framework, adopted (Rogers, 1962; Davis, 1989; Tornatzky and Fleischer, 1990; Goodhue and Thompson, 1995; Sen, 1999).

Rationale behind Conceptual framework

This framework harmonises people’s capabilities (Sen, 1999) with policy objectives, to establish the role of technology (through a top-down and bottom-up approach) and manages the adoption process using technology adoption models (Rogers, 1962; Davis, 1989; Tornatzky and Fleischer, 1990; Goodhue and Thompson, 1995). The rationale is that ICT adoption strategy must support people’s needs, conform to macro-level development objectives and draw from tried and tested technology adoption theories.

Components of Conceptual framework

- *Needs Assessment* uses Capability Approach for bottom-up investigation of people’s needs, priorities and capabilities. It was chosen for its ability to explore people’s capabilities (Sen, 1999; Jasek-Rysdal, 2001).
- *Development Objectives* This top-down policy objective captures investment priorities and development agenda of government. This is because ICT4D adoption requires key role of central authorities and it won’t work unless it fosters clearly defined policy objectives (UN, 2002; Batchelor and Scott, 2005).

- *Role of ICTs*: This identifies the information and communication components of people’s needs and government priorities.
- *ICT4D Adoption strategy*: Uses technology adoption and diffusion models to strategise and mainstream adoption of ICTs. These are post-use models, are being used for guidance at design stage. *Task Technology Fit* (TTF) will be used for assessing the potential of candidate ICTs to perform specific tasks (Goodhue and Thompson, 1995) *Technology Adoption Model* (TAM) and *Technology-Organization Environment* (TOE) are used for managing the adoption process at households and organisational levels respectively. This is because TAM explores adoption imperatives at individual while TOE assesses adoption at organisation level (Davis, 1989; Tornatzky and Fleischer, 1990) *Diffusion of Innovation* (DOI) is intended for mainstreaming ICT4D adoption. This is because it is useful for managing the way different groups adopt technology (Rogers, 1962).

Proposed Research Methodology

The thesis uses a mixture of survey and interviews to investigate adoption of ICT4D in Zimbabwe in an overall hermeneutic approach (Brannen *et al.*, 1994 and Brennen, *at al.*, 2000). A survey will be used to identify non random trends expeditiously and interviews will be used for interrogating the trends identified during survey and to explore the existence of any unexpected factors.

A unique approach is adopted for the challenge of investigating capabilities in a conflict zone requiring work at a distance. This involves a preliminary qualitative research conducted among Zimbabweans in the UK who come from the identified regions i.e. to 1) explore the relevant issues, 2) test and verify the validity of lessons lent from literature and 3) to investigate how to ask the right questions in the right way.

This exercise involves the development of novel Local Capability Maps drawn by selected subjects to reflect the socio-economic activities in their neighbourhoods in rural Zimbabwe. Focus groups are also used for exploring remittance practice and socio-cultural nuances that the research needs to consider. See table 1.

Research Action	Aim/relevance to RQ	Output	Contribution to model
Capability Maps	Inform data collection instrument design. RQ 1, SQ 1-4 at meta level	Picture of rural infrastructure and way of life	Needs Assessment (Nature of ICT and non ICT infrastructure)
Focus groups	Investigate key issues ICT use in remittances. RQ 1, SQ 3	Key themes for remittance	Needs Assessment (factors affecting remittances)
Survey Remittances	Investigate ICT enabled remittance economy	Role of ICTs in remittance economy	Needs Assessment (Scope of ICT use)

	and poverty reduction RQ 1, SQ 3	and poverty reduction	remittance economy and poverty reduction)
Survey ICT4D	Assess human capabilities, infrastructure and use of ICT RQ 1, SQ 1-4	Opportunities, infrastructure and ICT use	Needs Assessment (Skills, infrastructure and opportunities)
In depth interviews	Investigate deeper meaning behind survey findings RQ 1, SQ 1-4	Deeper meaning of factors affecting needs, barriers and opportunities	Needs Assessment (Reasons behind barriers, needs and opportunities)
In depth interviews	Investigate Gvt and NGO policy objectives. . RQ 1, SQ 1-4	Development policies of Gvt and NGOs infrastructure human capacity investment	Development Objectives(priorities, direction and reasons behind it)

Table 1 Research activities and their relevance to conceptual framework and research questions

Legend; RQ-Research Question; SQ-Sub Question

This mixed but mainly qualitative approach was adopted because information systems (IS) and e-readiness studies in particular are social issues that use technology; hence the need to investigate the natural and social science roots of IS (Hirschheim, 1992, Galliers, 1992).

Data Collection

Stage	Research Activities	Purpose	Progress
1	Local capability maps + focus groups	Inform data collection instrument design + use of ICT	In progress
2	Survey	Assess needs, Capabilities and use of ICT	In progress
3	Semi structured Interviews	Investigate deeper meaning behind survey findings	Pending

Table 2. Data Collection activities and progress

This thesis uses stratified sampling to identify subjects by socio-demographic variables that have a bearing on both digital and socio-economic divides. These vectors are gender, ethnicity, literacy, income and age (Mansell, 2001, Reddick, 2001, Vengefeldt, 2003).

Location	Ethnicity	Gender		Age		Income	
Total number of subject	Minorities 2%	Male 49%	Female 51%	Young 96%	Old 4%	High 10%	Low 90%
Harare 95		47	48	91	4	10	85

Bulawayo 74	4	36	38	71	3	8	66
Gweru 36	2	17	19	34	2	4	32

Socio-demographic distribution of sample Table 3.

Quantitative data collection will use a mixed survey instrument consisting of open ended and closed questions (Vitale, Armenakis and Field, 2008). It will be done by questionnaires administered by trained research assistants in the three Zimbabwean cities located in the three regions shown in fig. 3 below.

Location	Capability maps	Focus groups	Questionnaires	Interviews
Eastern region	2	n/a	95	10 provincial 5 national
Mid lands	2	n/a	74	10 provincial executives
Western region	2	n/a	36	10 provincial executives
London		3	10 pilot	n/a
Birmingham		1	n/a	n/a
Leeds		1	n/a	n/a

Table 4. Locations for data collection

Due to the difficulty associated with both accessibility and political stability in Zimbabwe, data that should have been collected from rural areas will be collected from 3 main cities’ bus stations to rural destinations. These are Mbare Musika in the eastern region, Renkini in the western region and Makaranga stations. See table 3 for the rationale behind their choice.

Qualitative data collection will employ semi-structured telephone interviews, focus groups and Capability Maps.

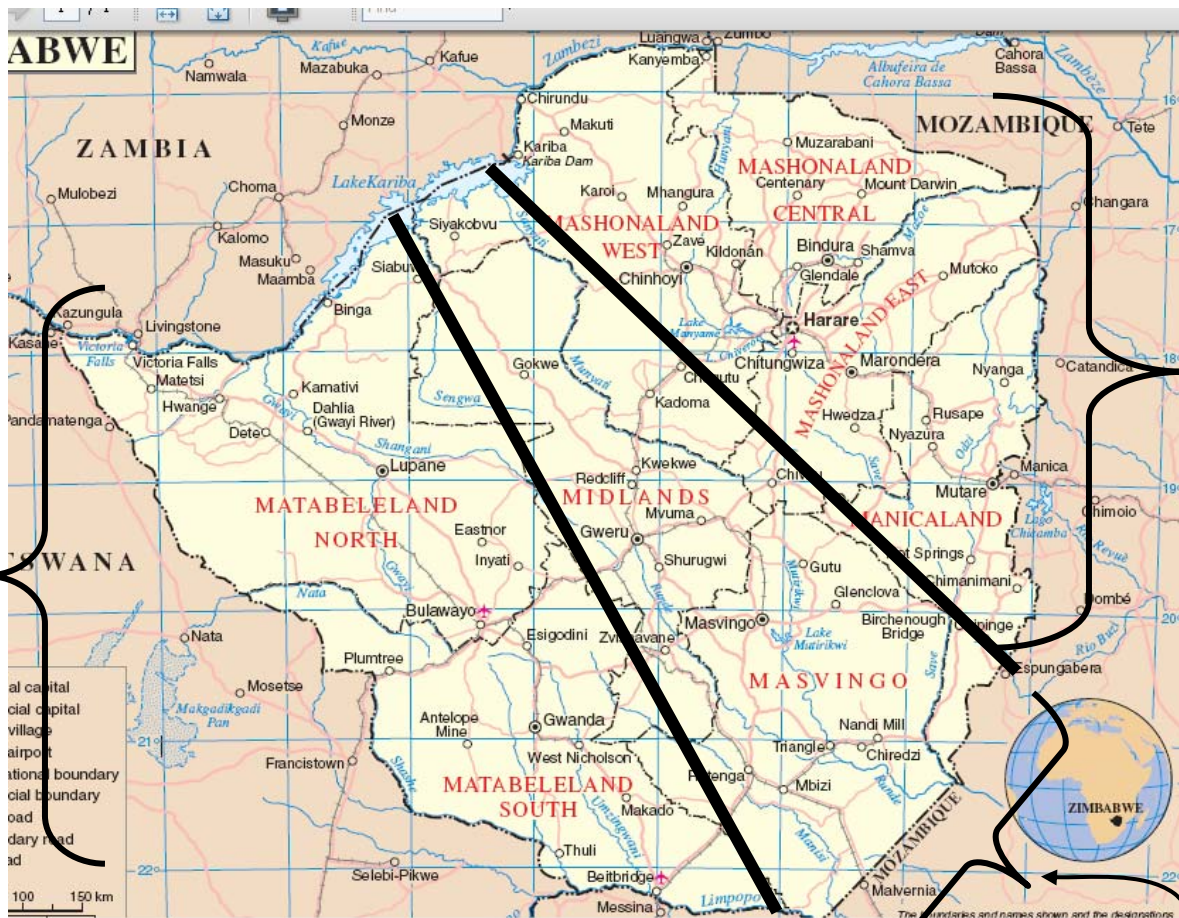


Fig 2. Map of Zimbabwe showing the three Sub Regions Demarcated for Data collection. Source: United Nations Department of Peace Keeping and Cartographic Section 2004(c)

Western Region
Matebeleland South and Matebeleland North provinces

Mid Zimbabwe Region
Midlands and Masvingo Provinces

Eastern Region
Mashonaland West, Mashonaland Central, Mashonaland East and Manicaland

Initial findings and planned analysis approach

Analysis

Quantitative analysis will use SPSS to produce descriptive statistics, while qualitative data will be analysed using the Ladder of abstraction (Carney, 1990).

Initial Findings

Local ICT infrastructure and economy

Legend: X: high penetration, x: low penetration, 0: none

Region	Place	ICTs			Way of Life	Institutions
Eastern	Chishawasha	Mobile	phone	electricity	Subsistence farming	Church, school, hospital, shops
	Kwenda	X	x	x	Subsistence farming, gardening	Church, school, shops
Midlands	Chirumanzu	X	x	x	Subsistence farming	School, Church, shops
	Sengwa Bridge	0	x	x	Sub-farming, Tourism	School, Shops, Game park
Western	Pending					
	Pending					

Fig 5. Capability mapping results

The capability maps are being drawn as part of the preliminary qualitative investigation. Overall results for this exercise are still pending since two more regions need to be investigated.

The first focus group shows that Zimbabwe is heavily dependant on remittances which are mainly transmitted through western union. Remittances are mainly spent on transient poverty and they are sometimes invested in flea markets and cross border buying and selling. Due to shortages, Zimbabweans are using ICTs to remit money and a wide range of goods services through online portals, couriers and money transfer agents.

Next Stage

The survey instrument will be refined to accommodate issues identified during focus groups, capability mapping and pilot study. After the data collectors' induction, field work will commence. Semi structured interviews and qualitative analysis will conclude the study, an analysis of which will inform ICT4D adoption strategy and theory building on how to combine Capability Approach and Technology adoption and diffusion theories in ICT4D research.

References

Alampay, E. (2006, August 10). Beyond access to ICTs: Measuring capabilities in the information society. *International Journal of Education and Development using ICT* [Online], 2(3). Available: <http://ijedict.dec.uwi.edu/viewarticle.php?id=196>.

Alkire, S. and S. Deneulin (forthcoming), 'Introducing the Human Development and Capability Approach', in S. Deneulin (ed), *Development and Freedom: An Introduction to the Human Development and Capability Approach*, Earthscan. 'A draft version of the chapter is available on www.ophi.org.uk

Batchelor and Scott, (2005). Good practice paper on ICTs for Economic Growth and Poverty Reduction OECD. *DAC Journal 2005*, vol 6, No. 3 available at www.oecd.org/dac

Brannen, J., Hepinstall, E., & Bhopal, K. (2000). *Connecting Children: Core and Family Life in Later Childhood*. London: Routledge.

Brannen, J., Dodd, K., Oakley, A., & Storey, P. (1994). *Young People, Health and Family Life*. Buckingham: Open University Press.

Carney, T.F. (1990), *Collaborative inquiry methodology*. Windsor, Ontario, Canada: University of Windsor, Division for Instructional Development.

Davis, F. D. (1989) Perceived usefulness, Perceived ease of use and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340 [http://links.jstor.org/sici?sici=0276-7783\(198909\)13%3A3%3C319%3APUPEOU%3E2.0.CO%3B2-E](http://links.jstor.org/sici?sici=0276-7783(198909)13%3A3%3C319%3APUPEOU%3E2.0.CO%3B2-E) Accessed 5 September 2007

Galliers, R.D. 1992. Choosing information systems research approach. In: *Information Systems Research: Issues, Methods and Practical Guidelines*, edited by Galliers, R.D., Blackwell Scientific Publication, Oxford

Goodhue, D. L., and R. L. Thompson (1995) Task-Technology Fit and Individual Performance, *MIS Quarterly* 19 (2), pp. 213-236.

Hirschheim, Rudy and Klein Heinz. K, (1992). Paradigmatic Influences on Information Systems Development Methodologies: Evolution and Conceptual Advances. [Advances in Computers 34](http://www.computer.org/advances/vol34/adv34_293-392.pdf): 293-392 (1992)

Iacovou, Charalambos L., Benbasat Izak, Dexter, Albert S. (1995). Electronic data interchange and small organizations: Adoption and impact of technology. *MIS Quarterly*, 19(4), 465-485, <http://www.misq.org/archivist/vol/no19/issue4/vol19n4art3.html> accessed 2 September 2007

Jasek-Rysdal, K (2001). Applying Sen's capability framework to neighborhoods: Using local asset maps to deepen our understanding of well being. *Review of Social economy LIX* (3): 313-329

McNamara, Kerry S. (2003). *Information and Communication Technologies, Poverty and Development: Learning from Experience* Information for Development Program, The World Bank. A Background Paper for the infoDev Annual Symposium December 9-10, 2003 Geneva, Switzerland www.infodev.org

Melkote, S.R. and Steeves, H.L. (2001) *Communication for Development in the Third World: Theory and practice for Empowerment*. NewDelhi.

Mhlanga, B. (2006). Information and communication Technologies (ICTs), Policy for change and the mask for development: A critical analysis of Zimbabwe's E-Readiness Survey Report. *IJISDC*, 2006, 28,1, 1-16 <http://www.ejisdc.org/ojs2/index.php/ejisdc/article/viewFile/339/185>
[Accessed 5 September 2007](#)

Mukhopadhyay, T., Kekre, S. and Kalathur, S. (1995). Business Value of Information Technology: A Study of Electronic Data Interchange. *MIS Quarterly*, Vol. 19, No. 2 (Jun., 1995), pp. 137-156

Ojo, T. (2004). Old Paradigm and Information and Communication Technology for Development Agenda in Africa: Modernization as Context *Journal of Information Technology Impact*. Vol 4, No, 3, 139-150, 2004

Ojo, T. (2005). Wiring sub-Saharan Africa for development, International, *Journal of Education and Development using Information and Communication Technology (IJEDICT)*. 2005, Vol. 1, Issue 3 pp. 94-107.
<http://64.233.183.104/search?q=cache:4uX95h1I1doJ:ijedict.dec.uwi.edu/include/getdoc.php%3Fid%3D772%26article%3D51%26mode%3Dpdf+Wiring+sub-Saharan+Africa+for+development+pdf+%22Tokunbo%22&hl=en&ct=clnk&cd=1&gl=uk>
accessed 5 September 2007

Rogers, E. M. (1962). *Diffusion of Innovations*. The Free Press. New York

Sen, A. (1999). *Development as Freedom*, Oxford, Oxford University Press, 1999, ISBN: 0 19 829758 0

Tornatzky L.G., and Fleisher, M. (1990). *The process of technology innovation*, Lexington Books, Lexington, MA.

United Nations (2000). *United Nations Millennium Declaration* General Assembly Resolution, 55th session, document A/RES/55/2, Chapter III, number 11. 18 September 2000

Vitale, D.C., Armenakis A.A, and Field, H.S., (2008). Integrating Qualitative and Quantitative Methods for Organizational Diagnosis. *Journal of Mixed Methods Research, Vol. 2, No. 1, 87-105 (2008)*

Wild, K.(2003). *A global overview of e-strategies – making the link with poverty and the Millennium Development Goals*. A discussion paper for the 5th Session of the United Nations ICT Task Force Geneva, September 12 and 13, 2003

Zhu K; Kraemer, K. L. and Xu, S. (2002). *A cross-country study of electronic business adoption using the Technology –Organisational-Environment framework*, Center for Research on information Technology and Organisations University of California, Irvine
<http://www.crito.uci.edu/publications/pdf/CrossCountryStudy.pdf> Accessed 4 September 2007