The impact of contextual factors on the implementation of government e-strategy in previously disadvantaged areas in Cape Town

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ABSTRACT

Despite the fact that it has been established that contextual factors affect implementation of Information and Communication Technology (ICT) projects, there is a dearth of information on how these were addressed in the implementation of the whitepaper on e-education in schools in previously disadvantaged areas in South Africa. This interpretive study, guided by contextual interaction theory, examines the impact of contextual factors in the implementation of ICT in schools in previously disadvantaged areas. The findings show that the implementation context and the history of the implementers and other issues that are in no way related to the implementation process affect the implementation process and outcomes. The results of this study offer those who carry out ICT in education implementation projects in disadvantaged areas in South Africa and similar contexts elsewhere insights into the Information Systems implementation dynamics.

Key Words: ICT Implementation; Impact of Contextual Factors on Implementation; E-Government Strategy; Policy Implementation; Education

1 RESEARCH PROBLEM

Despite the noble intentions and efforts driving implementation of information and communication technology (ICT) in education, the integration of ICT’s into teaching and learning has been wrought with challenges (Ford and Botha, 2010). Researchers have evaluated the adoption of ICT’s in education from different dimensions such as community informatics, digital divide, adoption barriers and self-efficacy issues. Studies show that there are problems realising the associated benefits of the ICT investments, inadequate ICT resources, limited access to the Internet, technophobia and age related adoption issues as older teachers have been found to struggle to adapt to using ICT for teaching and learning; shortage of skilled teachers to teach ICT subjects and security issues. Social status of the potential users of ICT’s has also been found to have a bearing on computer use and experience. It has also been established that there are issues with the high costs of acquiring and setting up ICT-based Management Information Systems (Wilson-Strydom and Thomson, 2005; Ford and Botha, 2010; Hodgkinson-Williams et al., 2007; Ng’ambi and Brown, 2004; Tas and Tatnal, 2010). Studies that have looked at the implementation process of the whitepaper have established that the implementation process is besieged with “dispersed and uncoordinated” implementation programmes and projects (Ford and Botha, 2010 p.1). These findings are not surprising as literature shows that planning and management of ICT projects is poorly done in developing countries (Galliers et al. 1998; Heeks, 2002).

Predominantly, existing studies have not focused on how the implementation process and context could have affected the implementation outcomes. The studies evaluate the successes and challenges faced by teachers in using ICT for teaching and learning. Whilst evaluation of ICT projects is problematic and subjective, research has shown that evaluation studies ought to investigate the underlying mechanisms and structures within society that can
affect the implementation and project outcome (Heeks, 2002; Irani, 2002). Furthermore, there have been for studies to unpack the interaction between ICT and the social-cultural, organizational, economic factors and context-dependent power structures and their bearing on the failure and successes of such projects (Zheng and Walsham, 2008; Walsham and Sahay, 2006).

It is in recognition of the dearth of studies on how contextual factors affected implementation of the whitepaper on e-education in schools in previously disadvantaged areas in South Africa that this study investigates the impact of contextual issues on the implementation of the whitepaper on e-education in these schools. There are two contextual parameters to consider, horizontal analysis, which focuses on the temporal sequences of events such as the history, and current status of events and the vertical analysis which focuses on the interplay among broader and more bounded levels of social contexts (Pettigrew, 1985). This is critical as the social system which is the “social context in which the innovation diffuses” (Rogers, 1995) and the cultural context which informs the researcher on how the history and culture affect perceptions and interpretation by agents within their social context have been found to be critical in the innovation diffusion process. Research has also shown that it is imperative that evaluation studies have a full understanding of the place of implementation, the implementers, their beliefs and the context that has shaped them into who and what they are (Laizen, 1999; UNDP, 2001).

Furthermore, researching into specific locations uncovers how the implementation process evolves in these contexts and exposes “how deep seated historical institutional patterns shape implementation outcomes” (Honing, 2006, p.100). Previously disadvantaged communities are defined as “persons or categories of persons who prior to the new democratic dispensation marked by the coming into force of the new constitution of Republic of South Africa (no 108) were disadvantaged by unfair discrimination on the basis of their race and includes juristic persons or association owned or controlled by such persons” (Nefcorp, 2005 p. 1). This group collectively constitutes black people, mainly Africans, Coloureds and Indians.

2. SOUTH AFRICAN CONTEXT
2.1 Overview
The study argues that the findings from South Africa regarding the implementation of ICT in education can be generalised throughout the country. South Africa ranks as the ninth unequal country in the world (Gillwald et al., 2012). The country is characterised by segmentation and dualism as a result of apartheid which divided South Africa into two segments which have contrasting natures, levels and paces of development (Fourie, 2011; Gillwald et al, 2012). Despite democratic rule since 1994, residential segregation has persisted in the new South Africa. The removal of racial barriers to mobility has enabled those with money to move out of the townships. “Deracialization” of the urban areas has been essentially “bourgeois”, as access to the city is based on money, leading to a segmented housing market (Gibson, 2007; Seekings and Natrass, 2005; Crankshaw, 2008).

Furthermore, previously disadvantaged areas are also said to be wrought by service delivery issues. The failure has been attributed to the adoption of “neo-liberal” policies by the government which are said to have reproduced the inequities of the past. These policies are reportedly hinged on redistributive financing. Municipal services have been privatised in pursuit of cost-recovery and private-public partnerships. This has allegedly led to the denial of basic social and economic rights of the poor as these policies are crafted such that those in high come areas pay more to get better services whilst those in poorer section pay less and get basic services (Beall, Crankshaw and Parnell, 2002; McDonald, 2008). This perceived
denial of service to the poor had led to service delivery protests in previously disadvantaged areas (Seekings, 2011; Nthambeleni, 2009; Atkinson 2007; Pithouse, 2006).

Post democracy, teachers feel that education is marred by a capitalist divide based on money and resources which make quality education accessible only to those who have access to the private schools. Studies have established that there is an exodus of “rich black students” from former black schools to former white schools in efforts to escape the “historical disadvantage” and improve chances of graduating (Chisholm et al., 2000). Desegregation in the Western Cape, has been entirely in socioeconomic terms, leaving the racial composition of both black neighbourhoods and black schools unchanged (Lemon and Battersby-Lennar, 2009). Eighty percent of children in Cape Town continue to attend schools intended for their race group under apartheid (Lam, Seekings, and Sparks, 2006).

Based on these factors, this study argues that there is need for studies to try to establish if there is any relationship between the research findings on ICT in education studies and the social economic context.

2.2 E-Education in South Africa

The South African government through the Department of Education embarked on initiatives to provide public schools with computers and other ICT’s in an effort to enhance learner’s access to knowledge and information. The government articulated this intention through the whitepaper on e-education policy (Government of South Africa, 2004). The whitepaper on e-education states that South African educators and learners ought to be fully prepared to operate in the information society (Government of South Africa, 2004). Provincial governments were tasked with the implementation of the white paper on e-education policy in different provinces. In the Western Cape, the Khanya project was set up to drive the implementation. The Khanya project, which began in 2001 had the mandate to assist schools, especially disadvantaged schools, in the acquisition of ICT for purposes of curriculum delivery by the year 2012 (Khanya, 2008). The project sought to be a “world leader in sustainable curriculum delivery through ICT; to increase educator capacity and effectiveness by means of technology; enhance the quality of the learning experience in the classroom by providing an opportunity for learners to benefit from a variety of learning styles; assist differently abled learners to maximise learning” (Khanya, 2008, p.1).

The project states that during implementation it took cognisance and was responsive to local conditions prevalent in individual schools. Furthermore, to ensure sustainability of the project, communities within which the Khanya project was launched were to be brought on board (Khanya, 2008). The implementation of the programme was done in two phases. In Phase 1, the project sought to identify, secure and install computers and educational software and Internet connectivity in computer laboratories. In Phase 2 the project trained trainers on the educational use of the technologies. Khanya appointed facilitators who were trained to train teachers. These facilitators also served as contact and support persons between the Khanya project and the schools. The duration of these training sessions for teachers varied depending on situations on the ground in school. The training sought to

- Equip the educators with basic computer theory and practice.
- Equip the educators with skills to enable them to Integrate technology into the curriculum delivery process
- Equip the educators with skills to use the computer and other ICT’s as tools for teaching and learning.
- Increase learning by designing lessons that use instructional technology (Khanya, 2009).
The training sessions took place once the school laboratories were opened or upgraded. The training sessions covered basic computer concepts, operating systems, the Internet, electronic mail, file management, word processing, spreadsheets, and presentations, computer literacy, educational software training and equipment training such as using scanners and interactive whiteboard. In addition, Khanya set up school based computer committees who were trained as local area network (LAN) administrators. The LAN administrators were also supposed to provide first-line support for the other teachers in the school.

3 THEORETICAL FRAMEWORK: CONTEXTUAL INTERACTION THEORY

This study used the Contextual Interaction Theory to understand what happens during policy implementation and why it happens. The theory provides a framework that highlights factors that can potentially affect implementation of policy. The theory outlines the factors that can potentially affect the policy implementation processes namely: characteristics of policy actors and interactions, cognition, motivation, resources and power, the setting and coherence of the public governance (Bressers, 2004). The theory has been used widely in (1) environmental sciences to analyse policy implementation (Bressers and Lulofs, 2010; Vazquez-Brust and Sarkis, 2012; Owens, 2008; Boer et al., 2013); (2) to investigate Human Immune Virus policy implementation barriers and prevention of infectious diseases (Spratt, 2013; Bakari and Frumence, 2013) and (3) to study the implementation of domestic violence law (Javakhisvhili, 2011). The following section presents the key concepts of the theory.

3.1 The Setting

The Contextual Interaction Theory states that whilst the characteristics of the geographical place and decisions surrounding the implementation provide an understanding of the setting, they do not determine the implementation process. Rather, the characteristics set the “institutional arena for the process that influences which agents participate, the extent of their participation and the available legal resources and expectations” (de Boer and Bressers, 2007 p.76). For a policy to be implementable, it has to be adapted to local situations as the local situation has a bearing on what can be done and by whom (Bressers, 2004). The theory clarifies that the adaptation to local circumstances can affect the policy implementation process as it can determine if policy gets implemented as articulated or goes in a different direction by diverging from the stated goals, leading to different outcomes (Bressers, 2004). During implementation, the setting can change due to

- changes in the actors’ cognition as the implementation process results in new learning processes that can bring about changes in the policy agents motivations
- Changes in the actors’ resources.
- Actors may change in response to their experiences or behaviours of others involved in the implementation process
- Actors deliberately changing the strategies they adopt to achieve such change.
- Changes in the actors’ capacity and power during the implementation process

Furthermore, changes in the wider context, the structural context and the specific context such as the political, socio cultural, economic, technological context can change the setting. These contexts can be affected by factors that are not related to the implementation process itself and not initiated by it (Ellis and Wildavsky, 1990; Bressers, 2004; Bressers and Lulofs 2010).
3.2 Human Social Interaction Processes

The Contextual Interaction Theory states that policy implementation is an interactive process which involves the policy proponents who by virtue of their official capacity have to actualise the implementation, the policy target groups and organisations. The resultant relationships are not vertical between higher and lower authorities but rather results of the relationships amongst the parties involved in the implementation process which ultimately determine the course and results of the process (Bressers, 2004). These human social interaction processes are affected by the motivation, cognition and resources of the involved agents.

3.2.1 Motivation

Motivation drives action. The agents’ motivation influences their activities and interactions and motives. Both the implementer and the target’s motivation are inspired by the same aspects. The motivation can be due to both internal and external factors (Bressers, 2004). Internally, the agents’ motivation is informed by their

- Standpoint regarding the policy problem.
- Compatibility of the goal and objectives of the implementer with the goals of the policy
- A belief systems and self-interests about the implementation goals.
- Priorities.
- Attitudes to the implementation objectives.
- Self effectiveness assessment (Bressers, 2004).

Externally, the need to act can be a result of job expectations, social standing, economic responsibility or political pressure. An actor can also be driven by identification with the group from which such expectations come (Bressers, 2004; Bressers and Lulofs, 2010).

3.2.2 Cognition

Cognition refers to what the agents in the policy implementation process believe to be the truth about policy problem based on the information they have about the situation. This affects ones perceptions, opinions and influences activities that one engages in regarding the situation (Bressers, 2004). However, information is based on one’s interpretation of reality. One interprets, assigns labels to an occurrence based on the frames of reference they have which they believe to be true (Bressers, 2004). This interpretation can potentially limit and prejudice understanding and affect motivation (Bressers, 2004).

It is therefore critical that policy agents have readily available and adequate information. Policy agents also have to have the capacity to collect and process information to be able to deal with any uncertainties they might have concerning the implementation project (Bressers, 2004). The ability to seek for information is critical as it has been established that if it happens that in the process of policy implementation, an agent who is actively involved and is sufficiently motivated, lacks necessary information, they stop taking part or carrying out such activities temporarily until they have learnt enough to proceed (Bressers, 2004).

3.2.3 Resources and Power

Resources give policy agents power and the capacity to act as they are a prerequisite for action. One’s power is legitimised and solidified through real resources such as formal rules, legal rights, institutional rules, money, skilled people, time and consensus as they are the sources of power (Klok, 1995). A resource, however, is only as powerful as its relevance in the actions that are to be carried out. The availability of resources influences the ambition of
the agents as when agents believe that there is scarcity of resources, the agent is more likely to avoid carrying out policy implementation activities as agents want to avoid cognitive dissonance (Bandura, 1986). When an agent depends on the resources of another agent, then the one who has the resources has the power (Bressers, 2004). To maximise the resource base to improve action, agents can form coalitions with others who have relevant resources although this might result in them losing their independence, autonomy and power.

Motivation, cognition and resources influence each other as changes in any one affects the other two. It is critical as for policy implementation to be successful, the agents who take part in the process, the policy agents have to be sufficiently motivated, have the required resources, and have power, information and authority to do what is required (Owens, 2008). Motivation, cognition and resources also influence the agents’ standpoint regarding the policy in question and in turn their position and activities and interaction with other agents in the policy network (Bressers, 2004).

3.3 Type of Cooperation between Stakeholders

The Contextual Interaction Theory claims that although those engaged in the policy implementation process are working towards the same goal, their attitude and motivation will not necessarily be congruent. The differences in attitude and motivation are attributed to the fact that although the agents are representatives of either the organisation driving the implementation or recipients of the implementation, they are still individuals whose traits, beliefs, opinions or characteristics come into play in the implementation process (Bressers, 2004). This potentially affects the motivation and cognition and type of interaction the policy actors and affect policy implementation outcomes (Ostrom, 1998; Bressers, 2004; Bressers and Lulofs, 2010).

The differences in attitude and motivation also affects the type of interaction between the policy actors. According to the theory, there are different types of interactions between policy implementers; namely joint learning, cooperation or collaboration and opposition. When both actors lack information about the project and they join forces to look for information this is called Joint learning (Bressers, 2004; Owens, 2008). In instances when both actors share the same vision and ambition for the implementation the type of interaction that occurs is classified as active-constructive cooperation. In instances where actors who are implementing a policy do so formally but are not passionate or driven by real interest in its adequate implementation the kind of interaction they give others is called Active-obstructive cooperation. Passive cooperation occurs when one party is impartial about the implementation whereas forced cooperation occurs when a more powerful actor forces a passive one to cooperate. Obstruction or opposition occurs when one actor attempts to prevent other actors from proper implementation and can result in conflict (Bressers, 2004; Owens, 2008).

3.4 Coherence of the Public Governance Component

In situations where several sectors, government or bodies are charged with implementation of the same policy, these have to be mutually dependent and cognisant of the impact of their actions on the outcome of the policy implementation process. To ensure that there is coherence it then follows that there should be clarity regarding responsibilities by clearly articulating who is responsible for what, required resources and who is supposed to provide these and policy implementation activities of activities and their coordination. Coordination of resource usage should be based on a common set of objectives and framework to ensure that any potential source of conflict in terms of goals and usage is resolved in pursuit of a common goal. This is necessary because at times policy actors have different perceptions of
the same problem and these have to be reconciled. The advantages of coherence are that there is

- less discord in the goals of the implementers and target groups.
- less uncertainty.
- more and improved information exchange.
- high degrees of trust.
- a common way of resolving conflicts.
- standardised procedures, policies, guidelines.
- enhanced efficiency in carrying out tasks.
- better prioritisation of tasks to be carried out.

Typically fragmentation is characterised by more discord between the actors, their goals, more uncertainty, lack of clarity of confusion (cognitions), and more stalemates (power) and, thereby, can hamper implementation.

3.5 Adaptive Strategies
As a response to unsatisfactory processes, those involved in the policy implementation can engage in adaptive strategies such as preventive action or avoidance tactics to avoid an unproductive setting before it becomes fixed part of their environment. The theory argues that it then becomes imperative that there are constant efforts to balance the evolving threats and opportunities of the context. These strategies can include but are not limited to the trying to alter the implementation process by either bringing in new actors or exclude existing ones or redefining the process and its issues, or even changing the implementation arena and its governance structure. In addition there can be efforts to change cognitions by introducing new information, creating media hype or repackaging the project and using new catchy key words and metaphors (Bressers and Lulofs, 2010; Van Buuren and Gerrits, 2008).

4. Research Methodology
Given that this study is idiographic, the chosen research strategy was a multi-site case study. The multi-site case study was a follow up to a larger collaborative seven-year longitudinal research project called Measuring E-Learning Impact in primary Schools in South African disadvantaged areas (MELLISA) by the University of Cape Town, Cape Peninsula University of Technology from South Africa and Universita’ della Svizzera italiana from Switzerland. The project sought to familiarise primary school teachers with ICTs and their use in teaching and learning and study the impact of ICT training on primary school teachers in the Western Cape Province over an extended period. Our involvement in MELLISA formed the exploratory phase which sensitised us to the use of ICT for teaching and learning in previously disadvantaged areas. The exposure provided us with insights on the problems and success of the usage of ICT for teaching and learning. The exposure did not, however, give us insights on the impact of the context on the implementation process (Bytheway, 2010).

4.1 Selection of Study Area
The previously disadvantaged part of Cape Town selected for the study is Langa; a well-established Xhosa-speaking community located outside the Cape Town city center. The selection of study area and the respondents was based on how appropriate the selected study area and selected respondents suited the phenomenon under study. In this study, the two criteria that were uniquely suited for this study were the social system which is defined “as the social context in which the innovation diffuses” which is affected by social norms or “the established patterns of behaviour that tell members of the system what behaviour is expected” (Bhattacherjee, 2012). The other criterion was the naturalistic inquiry which posits that social
phenomena ought to be studied within its natural setting as “social phenomena are situated within and cannot be isolated from their social context” (Bhattacherjee, 2012 p.106).

4.2 Study Population and Ethical Considerations
The primary data was gathered during visits to schools in Cape Town during the months of June 2012 to September 2012. Four schools in Langa were asked for a list of all educators in their schools. Given financial and time constraints we limited the sample to 32 teachers from the four schools. In addition, three regional e-education officers in the e-education unit from the district and regional office and four school heads were interviewed. Other sources of empirical data were sections of the e-education policy that are relevant to the study. Using multiple sources of data as indicated in Table 1 done to overcome bias that would come through if only teachers were interviewed (Myers and Newman, 2007). The data from the different sources was used to inform the study to gain in-depth information.

Table 1 - Summary of the different data collection methods in the research approach

<table>
<thead>
<tr>
<th>Data collection Methods</th>
<th>Use in the research approach related To research problem</th>
<th>Role in the data analysis</th>
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| Review of project documentation and media discourse | Documentation related to the implementation of the whitepaper in e-education. Media reporting on the implementation of the whitepaper on e-education in the western cape | • establish what the Khanya project and e-education whitepaper on e-education aims to achieve and why  
• understand the role players and what they are expected to do  
• establish the public and media perceptions about the project |
| Semi Structured Interview                         | The semi structured interview                                                                                                | • understand the interviewee’s reality from their perspective,                             |
| Panel Discussion Innivate Conference Wynberg Girls' High School Cape Town 2nd-4th Oct, 2012 | Presenting preliminary findings and allowing stakeholders to have discussions                                               | • to validate the preliminary findings.  
• Encourage dialogue between the stakeholders on the findings |

4.3 Data Analysis
Data analysis was done iteratively and emerging patterns consistent with concepts and relationships derived from the Contextual Interaction Theory were established. Data was reviewed and coded to establish recurrent themes for each participant. Areas of deviation from themes or concepts of the theoretical framework were also established. The unit of analysis was segments of texts rather than individual words or phrases. Meaning comprehension enabled the study to understand the subjective meaning of experiences and situations for the policy agents. Member checking was done during the panel discussion where the findings were presented; this enabled the study to evaluate the authenticity of researchers’ representations of participants’ perspectives worlds, and to consider the extent of
reciprocity between the researcher and those researched. This approach allowed us to organize qualitative data to make sense of unrelated material (Boyatzis, 1998).

5 FINDINGS

The Khanya project reported that on August 2010, 1,189 schools had been equipped and enabled to use technology effectively. Khanya reports that 28,419 of the computers have been funded by Khanya or its donor partners, and the 17,028 have been procured by the schools themselves. The study established that schools did not have any say in the management of the resources proving that at times forming coalitions leads to loss of power. Khanya prescribes who can and cannot use the available resources, when these can and cannot be used. One of the teachers remarked that

“Khanya is too strict. Even if [a teacher] does not feel competent, they have to come with their [learners]. It is a matter of doing it. Because we got a timetable. A scheduled timetable that you as a teacher, class teacher, you must bring your kids to the classes.”

Khanya had the legal and the resource power. All this was articulated in the terms of reference that legitimised the inception of Khanya. The resources Khanya had were powerful as they were relevant to the actions that had to be carried out. This act essentially stripped School heads of the powers that they were given in the Schools Act. Principals were powerless in the implementation of ICT in education as they did not own the resources. According to the South African Schools Act (Section 16), principals are charged with professional management of public schools. However, despite housing the resources in schools and school heads did not have much to say.

5.1 The Setting and its Impact on Implementation

According to 2011 Khanya report, prior to the implementation of the government strategy on e-education, public schools had no technology for use by students thus policy was not implementable (Khanya, 2011). Schools in previously disadvantaged areas had no computers or ICT’s and the teachers were not ICT literate and the students also had no access to ICTs. (Khanya, 2008). The lack of resources, lack of skills and exposure has a bearing on the extent to which the agents could participate and the extent and quality of participation (Bressers, 2004). This was to an extent as result of the history of South Africa and its past education policies

Furthermore, as stated by the theoretical framework, during implementation, the setting changed due to a number of reasons. The teachers’ cognitions changed as they learnt how to use ICT in teaching. This did not however give them the capacity to act effectively and they still needed support which was not forthcoming. In addition the inability of schools to maintain the resources resulting in changes in the actors resources. This affected their ability to act. These experiences and behaviours of others involved in the implementation process also changed the setting

5.2 Resource Availability

The educators stated that they had the following challenges regarding the use of ICT in teaching and learning the teachers mentioned that there were

- not enough computers as result have students in groups of three instead of two which makes it difficult for them to control students.
- non-functional computers with no funds for repairs
- perceived lack of interest of management
poor communication between schools and provincial department of education which compromised efficiency
• limited time allocated
• lack of training opportunities
• overloaded with too many administrative burdens
• having to attend too many training sessions on curriculum matters

It also emerged that teachers did not have access to computers outside the scheduled time. The teachers did “...not have computers in the staffroom, only the principal and the secretaries”. This led to teachers disturbing others whilst they were having lessons; one teacher noted that “sometimes you are having a class here and just like this one wants to do her work here, and you are having a class here”. A teacher stated that “Teachers should have their own space to work and not having to share with the learners.”

5.3 School-Based Agents Skills Base
At the start of implementation, the teachers underwent training that was two dimensional: (1) how to use computers and (2) how to teach using ICT’s. Even though they were still learning, they had to teach their student how to use ICTs and how to learn using ICT’s. In recognition of this and since everything was new to teachers, the project claimed that back-up support would be provided to educators after the implementation until teachers are comfortable. The teachers reported that the project “just train teachers and make no follow ups”. One of the teachers stated that

“the problem is the Western Cape Education Department.... the Department has got this changing every now and then. The only workshop we did here was the two week workshop. I think two weeks are not enough. It is not going to cover the whole thing.

The teachers raised a concern that they were not given time to master the skills between training and implementation. The teachers did not feel that they have the requisite ICT skills. This is despite the training done which sought to “empower all learners and educators in the schools to develop the necessary skills to use ICT in support of successful curriculum delivery” (Khanya, 2008). One teacher noted that the main problem was

“there are still things that other teachers do not understand. Before some of them didn't even know how to save the documents. Now they need to know how to download something from the Internet... but there are things that they are still not aware of. For example, if somebody is downloading information that is PDF if they can't open it, they still need to know that you now close the document and click on Adobe Reader and open. So there are still small things that they still need to learn from what they have done....”

The other issue that emerged was the quality of training; one of the teachers stated

“I think they have done their best, but it was only time. It was short, so we didn't have much knowledge. Maybe some of us needed more time, it was only once a week, for two or three hours. The next week we had forgotten what we have learned. So we need more time then we will be experts.
Despite the issues about mastery and skills, some teachers indicated that they used ICT for teaching and learning. Specifically they used word processors to type and print assignments. One teacher reported that

“one of the things that I have learnt is ... that you can also print two pages on one page”. Some of the educators used PowerPoint and Excel especially “when we prepare ourselves for doing the marks”.

They also reported that other than subject-specific software, they also used the Internet, Google and Whiteboard.

5.4 Perceptions of Teachers on the Intention of the Government Strategy

The policy creates an impression of a socially inclusive education system through statement such as “an awareness of the need for equal distribution of educational opportunities” (Government of South Africa, 2004, p.8). ICT’s are projected as enablers for this transformation as they can “enable teachers and learners to move away from traditional approaches of teaching and learning” (Government of South Africa, 2004 p.16) especially as the teachers are obligated to “deliver on public expectations of quality education for economic growth and social development” (Government of South Africa, 2004 p.8). Statements such as “a global revolution is currently taking place in education and training. It is driven by the changing nature of work, the realities of the information age” (Government of South Africa, (2004 p.8) are used to set the context why it is important to use ICT for teaching and learning. In addition, the claims contained in the policy create hope in the readers as ICT are projected as offering a better alternative. The document uses statements like “the use of ICT will create new ways of information gathering, sorting and analysis” (Government of South Africa, 2004, 2004 p.6).

During the interviews the teachers were given a chance to comment on the intentions of the whitepaper on e-education. They were of the opinion that the intentions or expectations were “positive for teaching and learning”. The teachers, however, indicated that they did not have the skills or time to successfully carry out the implementation as they had “problems with accessing computers and school politics”. The consensus was that although the intentions were good they were “useless as we have no guidance, support to achieve these” as they are “difficult to implement as some teachers don’t know anything about ICT”. One of the teachers stated that “ICT are pivotal to the learners of today who live in a technologically advancing society but teachers are reluctant to use technology because they are not confident of their skills”.

The study established that despite lack or shortage of resources, teachers believed that the problem was important- some of the teachers stated that “If resources were enough, ICT’s can improve the quality of education”. Teachers felt that the problem of shortage of resources affected learners negatively as some of the teachers reported that “Learners should also have more time; if learners go once a day, how do you expect them to be literate?”

5.5 Social Context

The teachers felt that the context from which their students came from affected the students’ perception of usefulness of technology for teaching and learning as

“… some do not even have electricity or those who were very willing and eager to use these at school could not practice at home as they do not have these at home negatively affecting their desire to use ICTs”.
One teacher reported that she struggled with students at the beginning of Grade 1 as it was the first time for some of the students to see computers. She stated “That’s why I say the first day when they come in here: Touch whatever you want, just don’t break it, just touch, shake it, and shake it. What do you hear? Because I know at the end of the day I am going back to what I wanted them to learn”.

With time the students are reported to become enthusiastic and enjoy computer lesson “Even in the morning when I am coming through the gate: ‘Miss it is Tuesday’. Then: ‘What must I do?’ ‘No miss, it is computer day today’. They are eager”.

5.6 Type of Cooperation between Stakeholders

5.6.1 Interaction between the Policy Proponents Policy Target Groups and Organisations.

Despite having the teachers trade unions present at the meetings held by Khanya teachers expressed that they are not allowed to comment on the use of ICT for teaching and learning as they would have taken the chance to discuss the issue of availability and sustainability of ICT in previously disadvantaged areas. Furthermore, educators felt that Khanya and officials in-charge of implementation of e-education “do not understand our situation as we are still struggling in terms of resources”.

The educators further stated that official’s in-charge of implementation of e-education “just implement without checking us” “... they just have good policies on paper but no follow through; just train teachers and make no follow ups. They do not know what is happening on the ground. Policy makers should come to schools to see things as they are on the ground. No, they do not they do not involve us when they formulate these policies when they implement these – they do not monitor nor make follow ups”.

The teachers felt that failure to understand their situation by policy implementers was detrimental as they needed “Internet, needed support to upgrade software and hardware, ended up applying ICT in an inconsistent, manner thus not fully utilising ICT and felt that Learner performance was affected as learners are not getting the exposure and support they need”.

Some of the teachers felt they needed “guidance to know we are on the right track”. One teacher remarked that “lack of information about equipment” is a barrier to using ICT’s sometimes. One of the teachers stated “I wish I can get more other information from Khanya and MELLISA. The problem is that we seem to forget other things. We seem to forget about these things. We tend to be trained and then we don’t implement these things.”

They felt that policy makers should come to schools to see things as they are on the ground and that policy makers really didn’t care as
“No they know that our schools are no fee and thus we will not be able to maintain the labs but they made no plans to assist as they could have employed full-time staff members to evaluate the use of ICT to ensure it is done in the school”.

On the other hand, the officers felt that educators were not pulling their weight and were concerned that a lot of money had been spent on training and procurement of resources which were lying idle in schools and not used. The contextual interaction theory states that as a response to unsatisfactory processes, those involved in the policy implementation can engage in adaptive management or strategies to avoid an unproductive setting (Bressers, 2008).

5.6.2 Interaction amongst Educators
Despite Khanya having set up school based computer committees which served as LAN administrators, the support that educators gave each other was informal; educators would ask one another for assistance as the schools did not do needs-analysis to audit skills and use skilled teachers to train other teachers. One of the teachers reported that “I assist the teachers in the computer lab .... Sometimes they ask for help that is technical and that they don't understand.” The teacher indicated that assisting in the computer room disturbed her teaching

“.... If there is something wrong with the email I have to come out of my class and sort it. And the secretaries are having a problem with assignments; she comes and asks for assistance. I need to come out of the class”.

The teachers also felt that the school management did not give them enough support; they did not run workshops to assist them in areas where they were incompetent. Some teachers felt the school management did not provide support for the teachers since they “too need support”. Others felt that the school management “don’t use ICT so they don’t care”.

5.7 Teachers’ understanding of role in ICT implementation
Regarding the implementation of the whitepaper in e-education, the study established that educators did not have knowledge about their role and that of other stakeholders in the policy processes. The educators indicated that their role regarding the use of ICT for teaching and learning was to assist where they could and encourage learners to use ICT. Some teachers felt that they did not have the responsibility to teach their students how to use ICT. Some of the teachers felt that ICT literacy should be a subject on its own. However, from the Whitepaper, the educator’s role is more than just assist. There was also evidence of mental fatigue as some of the teachers felt that “there are so many things, new things that are coming in and out. When you start adopting yourself in the new things, something else that will come in the next day. It is so confusing and there is a lot of paperwork.”

6. DISCUSSION AND CONCLUSION
6.1 Conflicts of Power between Stakeholders of Implementation
Whilst the educators, policy makers and Khanya all agreed that ICT’s were important for teaching and learning, this study concludes that they were not in sync in terms of how to implement and use the ICT’s for teaching and learning. This validates the theoretical framework claim that despite working towards the same goal, the policy agents’ attitudes and motivation will not necessarily be congruent as these are influenced by individual traits, beliefs, opinions or characteristics (Bresser, 2004). During training and implementation, Khanya issued instructions; Khanya could do so as they had the power to. They based their interactions on power structures. There are five sources that give others power over others;
namely legitimate authority over the target, the ability to reward, the ability to coerce, expert knowledge and control of the target's critical activities (Thompson and Luthans, 1983). However, basing their interactions on power structures was a critical flaw on the part of Khanya. Rigidity in implementation limits implementation as it stifles adaptation to suit implementation context (Edward III, 1980 in Makinde, 2005). Policy agents need flexibility to adapt policies to make them suitable for their context.

Despite Khanya having the power to control the going on regarding usage of ICT’s in schools, the Khanya officers expressed that resources were just laying idle unused in schools. According to the theory, interactions of the policy actors should not be based on power structures but on influence. Khanya should have avoided using legal coercion options, which have been found to be difficult and lead to resistance (Yukl et. al, 1993). Khanya’s power base was expert power; harsh tactics are incongruent with expert power (Klocke, 2009). Furthermore, Khanya seems to have overlooked the fact that they lacked legitimate authority and had limited powers to directly influence educators. This can be attributed to the type of relationship that existed between policy actors; the theory states that to a large extent the course and results of the implementation process are determined by the relationships between policy implementers (Bressers, 2004).

It is imperative that in instances where organizational actors have no authority over individuals on whom they depend to achieve their policy implementation goals, they enact effective influence or social influence approaches (Kotter, 1985; Cohen and Bradford, 2008). In such cases it is recommended that policy implementers deploy soft tactics such as consultations, education, rational persuasion and rewards to foster cooperation and change the policy actors behaviour and get them to commit to the project (Farmer and Aguinis, 2005; Schwarzwald, Koslowsky and Agassi, 2001). Furthermore Khanya should have recognised the organisational context within schools as this would have helped the project in improving support for the project in schools. Prior to the implementation in Schools, Khanya appointed facilitators who were trained to train teachers. These facilitators in some instances were not part of management. The failure of Khanya to recognise the organisational context within schools affected the implementation.

6.2 Inadequate Support from local Top Management to Enact the Changes Necessary for Implementation
Khanya gave priority to training of teachers, however, the project did not place much emphasis of training school management. The school management in the study were not conversant in the use of ICT for teaching and learning. This flaw affected the policy implementation. Hayes (2007) states that although ICT implementation in schools is driven by classroom teachers, it is ultimately the quality of leadership and management of ICT in a school that determines the success of the process. Pelgrum (2001) posits that positive attitude from administration facilitates efficient integration of ICT’s in the teaching and learning process mainly because by virtue of being school leaders they can motivate teachers to use technology in their lessons. Furthermore, it is imperative that school administrators be competent in the use of the technology and be conversant with the technical, pedagogical, administrative, financial, and social dimensions of ICTs in education for the integration to be effective and sustainable (Sife et al., 2007).

6.3 Lack of Sustainability of Interventions.
The teachers in the study had problems with technical maintenance of ICT’s in schools. Pelgrum (2001) states that the breakdown of ICT’s causes interruptions which may result in teachers being discouraged from using computers in teaching because of fear of equipment failure especially where there is no technical support (Buabeng-Andoh, 2012).

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The educators had wide-ranging challenges regarding the use of ICT in teaching and learning. There were non-functional computers with no funds for repairs. It is important that schools have technical assistance to provide technical support to deal with repair and maintenance of ICT equipment (Chisholm 2003; Wang and Woo, 2007). Failure to provide technical support has negative impact experiences teachers have with ICT’s affects their computer attitudes and consequently impact the on implementation success. The failure to provide the technical support can be attributed to policies that are being implemented in the wider context. Schools in previously disadvantaged areas are unable to maintain or upgrade their resources because of the neo liberal policies of cost recovery and cost sharing. They do not necessarily have access to resources because service provision is driven by redistributive financing which has reproduced the inequities of the past. These schools are in areas that are poverty ridden (Beall et al., 2002; McDonald, 2008).

6.4 Stakeholder Consultation

The study established that schools and teachers were not involved in the decision making process regarding the implementation and usage of the ICT. This is problematic as evidence from behavioural science indicate that participation in the decision process encourages an increased level of compliance (Lewis, 2013; Hesling et al. 1988). Whilst to the government of South Africa and maybe to Khanya, ICT’s were instruments of transformation, Yanow (1996) states that organisational symbols are subjected to interpretation by multiple receivers and thus cannot have just one intended meaning. One’s knowledge and understanding of reality depends on how one makes sense of what confronts him or her. It is therefore not surprising that educators needed interpretation to support their understanding of ICT’s. Seashore et al. (2005, p.178) state that “when teachers are confronted with a new policy, their interpretation of it will determine whether they engage in significant change, incremental change, or resistance”.

Policy implementers ought to dialogue with the target group to ensure that they clearly understand the expectations, rights and responsibilities as a collective, make sense of their collective challenges and develop a strategy for action (Unger, 2002; OECD, 2002). Given that Khanya had espoused that they will take cognisance of the local situation, they should have consulted Teachers Unions who are the legal spokespersons for teachers. This might have enabled the policy actors to overcome differences in perceptions of reality. Lack of information during policy implementation can be divided into two major categories. Namely, missing information and information asymmetry (Blandford, 2007). Missing information is information that is not available as and when it is needed to enable those who need it to carry out administrative or operational activities. Missing information may increase uncertainty about the appropriate policy actions and policy ineffectiveness. The other type is information asymmetry which refers to instances where participants in policy implementation have different levels of information on a given issue to the disadvantage of the one that possesses less (Bharath et al. 2009). This is attributed to the fact that policies only articulate expectations or desired behaviour, but do not describe the precise actions to be taken. To attain the desired behaviour, people need to understand what is required (OECD, 2002).

In this study, educators had less information compared to the Khanya officials hence their dependence on Khanya officials for support. One seeks for information in several ways, either from formal systems such as information systems or from any other system which may perform information functions in addition to other primary, non-information functions such as the Khanya people (Bryk et. al, 2010). The educators seem to have chosen the latter option as they seemed to want to rely on reassurance from the Khanya people which was not readily available. Furthermore, lack of clarity in roles, functions and accountability of the different sources of authority affects policy implementation. The teachers assumed that Khanya was
7. Conclusions
The study highlights how outcomes of ICT implementation can be affected by several factors. In this study the key determinant of the outcome is the degree to understand and manage the implementation context. Policy actors need to manage the entire process and not just assume that the success of the process depended on the provision of initial resources. Failure to help the educators to make sense of the integration process and the emerging challenges from the implementation was detrimental.

Despite these challenges, this study concludes that whilst it is questionable if the educational potential of the poor schools was brought on par with that of the affluent ones, it is an undeniable fact that transformation took place. Learners have the chance to access the best learning material available; material that they may have been deprived of in the past. Whenever ICT policies are implemented, people’s livelihoods change based on how the in the technology is used in the local context (Mansell, 2005). The findings also demonstrate that for one to evaluate one need to understand the implementation process and the implementation context. It is also imperative that one also has an appreciation of the changes that might have affected the implementation outcome and appreciate the changes brought about by the implementation. This study did not explore how the implementation process was carried out and perceived by teachers in areas that are regarded as previously advantaged areas and compared the findings to the perception of those in previously disadvantaged areas. It will be interesting to uncover similarities and differences if any in implementation approaches and teacher behaviour to then be able to explore the causes of the differences and similarities. Furthermore, it will be interesting to explore reasons why it was difficult for the teachers and officers to communicate effectively.

8. References


