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EVALUATION OF IMPLEMENTATION OF THE UGANDA COMMUNICATION COMMISSION (UCC) SCHOOLS ICT LABARATORY PROGRAMME: A SOCIO-TECHNICAL PERSPECTIVE

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Abstract

Ministry of Education and Sport in Uganda in pattern ship with Uganda Communication Commission (UCC) purchased computers and installed them in selected secondary schools in Uganda to help both students and surrounding communities in an effort to uplift IT literacy among Ugandan. It has since then been observed that a few interest groups like the army have been able to put this to use. The researchers set out to assess the infrastructure, security and other enabling condition using a cross sectional survey design on selected secondary schools from the four regions of Uganda. Findings showed a low level of usage due to lack of commitment by the entrusted officers, which is as a result of low pay and lack of proper training. The researchers thus recommend that training and incentives such as raised pay and allowances be enhanced.

Keyword: *ICT, Infrastructure, Security, Community.*

1. Introduction

Educations systems aim at equipping learners with pertinent skills to apply in solving day to day problems. Such skills are provided in various ways ranging from practical to theory orientations. With an invent of computers some of these approaches have undergone mutation to the effect that classes can be ran, assessed and monitored away from physical sites. In view of exploded knowledge sources, ICT has become an integral component of modern education. ICT helps in delivering content, downloading related material, viewing videos of related labs among others. African governments, for that matter are trying to incorporate it throughout the teaching learning process in their schools.

Communication Commission (UCC) in partnership with the Ministry of Education and Sports (MoE&S) of the Uganda government conceived a program to increase ICT usage in Uganda, by establishing an ICT laboratory in all government secondary schools. The concept is that if all children leaving government secondary schools are aware and can use ICT by the time they get out of secondary school, a good foundation in ICT, for the country would have been laid. This will mean that there is a good population of young people capable of taking advantage and driving ICT use and innovation in the country. This population would feed both the ICT market and also increase the creativity and innovation in the ICT sector. As a socio-technological benefit to the surrounding communities, all schools benefiting from the programme were required to make available the facilities to the surrounding communities for both training in ICT and use (communication and information). Many aspects of our lives are now being affected by ICTs. The Convergence Model presents that ICTs are increasingly building strong linkages among cultures, work environment, social life (entertainment), knowledge and health-Globalization (Bradley, 2006).

The study focused on socio-technical perspective. Social dimension entails culture and structure while technical dimension entails methods and machines. The proposed ICT project involves both schools and surrounding communities who have varying cultures and levels of organizational structures (Kowalski, 1994). Schools are run by head teachers and teachers along parents' support. They also have things they believe and norms they adhere to. The project is supposed to have computers connected in a network form and procedures will be suggested on how these laboratories will work (methods).

The Result Base Management evaluation model argues for stronger involvement of all stakeholders in designing, implementing and evaluation of developmental programmes. This is because as funding for ICT becomes scarcer, funders for ICT development programmes are increasingly looking to fund only those projects which derive maximum benefits as perceived by all stakeholders. This means that the success of a development project is no longer judged by only the target group but by also the surrounding communities. Such developmental programmes must seek to involve the community in determining the outcomes of the project as opposed to the financier and implementer determining the outcomes by themselves (Wallace, 2006). This is all because it is now recognized that community involvement is critical to the success of any developmental projects.

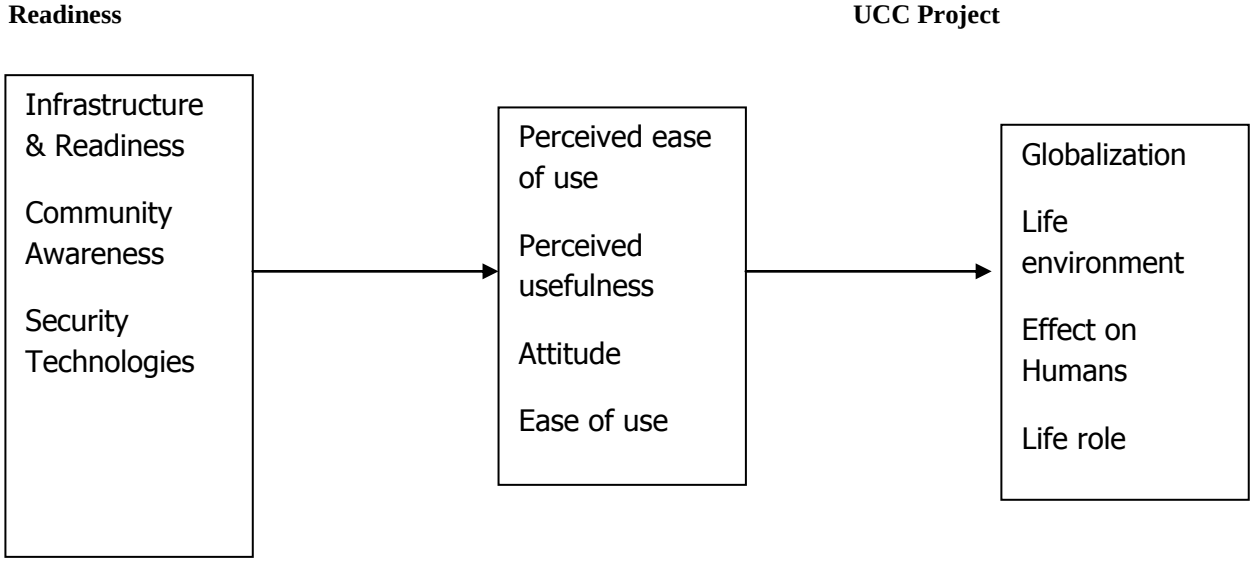
Community involvement has proved benefits of nurturing ownership and self worthiness, sometimes counter fund contributions, from the community, security ideas and motivation (Najjemba et. al,. 2012). Implementers of Programmes for developmental must be aware that as ICTs infuse in the lives of citizens, roles of individuals change both socially and psychology. Socially, citizens begin to get more involved in wider scope of interests like politics, education, communication beyond the immediate community, trade and others. Psychologically citizens improve in self-

esteem which can positively impact their contribution to community development as well as self development (Bradley, 2006). The Technology Acceptance Model cautions for constructive involvement of communities in ICT developmental, well aware that there are causal linkages of between how communities perceived benefits from a new technology and their acceptance of the technology (Davis et al. 1989).

The main objective of this program is to enable integration of ICT into the teaching and learning in all Uganda schools as well as increasing ICT awareness and use by the surrounding communities. The programme involves UCC supplying and commissioning a computer laboratory with 40 computers, with power supply (main grid if available with standby, solar and or generators, for those schools not on the hydro electricity grid). The ICT laboratory would be connected to internet and subscriptions for one year paid by UCC. UCC would also fund the creation of the initial content (science based) and carry out basic training for the teachers that would run the laboratories. After launch, the schools were expected to take over and run the programme by essentially teaching and allowing school children to learn and use the computer laboratory while at the same time allowing the surrounding community to access for communication and information the laboratory. The schools were required also to teach the surrounding community as a way of raising ICT awareness for the community. (UCC RCDF Annual Report 2009/10).

Issues pertaining to a need to evaluate project implementation of UCC ICT Laboratories include: i) The number of students in the target schools is too big implying inadequate facilities for the surrounding community members to access; ii)The population of the surrounding community is also too big for the ICT laboratory of selected schools to accommodate. If the population is too big then it cannot be adequately served by the limited facility which is to be shared with the school population; iii) Some schools have been reluctant to allow entrance or even use of the facility by the surrounding community due to security, control, costs and related issues; iv) Most schools feel a compromise of their information security, if the surrounding community is allowed to access. Among the local communities, may be IT savvy individuals who may guise under such an avenue to penetrate school databases and perform dubious acts; v) There is reportedly slow internet connectivity which may affect speed deliveries of science content for on line classes. This is also affecting internet cafés despite paying relatively huge amounts of money; vi) There has been low awareness of the existence of such a facility, by surrounding communities. Generally, local populations don't easily adopt a change; quite a long time is allowed for them to realize the net benefit. In this regard, targeted communities are skeptical about the relevance and benefit of UCC project to them; vii) It is currently security communities (barracks) that seem to pick up the project faster than other communities and yet the project is meant for all; viii) Uneven power distribution among government aided schools which may have significant influence on smooth running of ICT labs. This normally affects availability and sometimes causes equipment failure. Therefore the issues pointed out should be addressed to pave way for a smooth implementation and realization of good output of UCC ICT project. Therefore the purpose of this study was to evaluate the implementation of UCC ICT Laboratory project in Uganda.

Conceptual Framework



Source: **(**Davis, et al, 1989; Bradley, 2005)

The conceptual framework above insinuates that considering pattern schools' capacities to receive and implement UCC ICT lab project; relatively acceptable community awareness of the project and its benefit to them and ICT Savvy of implementers in terms of security technologies , this project will significant transform communities in as far as narrowing the world scope into a village (globalization), affect their work style in that one can perform office work at home and generally make life simple to live. The success of this project would significantly be affected by implementers perceptions on ease, usefulness and net benefit of the whole project.

2. Review Of Related Literature

System Vulnerabilities

There are various system security vulnerabilities experienced today and these include but not limited to: (Neil, Christoph & Anita, 2007): Anonymity is where an attacker accesses a computer system on a network infrastructure from far distance. The commonly experienced scenario is when one's computer system pops up a 'low memory' message and yet one or two programs are loaded in RAM. Computer networks like the ones set up by UCC for the schools are often easy target by such attacks. Vulnerability is further complicated by the fact that most of the members of the community from the surrounding communities are ordinary users at best, learners for the most parts, whose security consciousness is not yet well developed.

ICT Project Implementation

In an effort to address the Digital Divide, there are many ICT developmental projects aimed at addressing many inequalities in the world, through the use of ICTs, have been implemented and others are being implemented while many are being planned. It is mandatory to examine the success rate of especially ICT projects for purposes of ensuring realization of the objectives to all stakeholders who include financiers, beneficiaries, ICT experts, developmental experts, among others. Some studies have shown that on average the success of ICT developmental projects is currently standing at about 33% (Rubeistein, CHAOS Report, 2007). Others put the success rate of ICT projects (e.g. in South Africa a developing country with high penetration ICT indicators in Africa) at an average of 43% (Sonnekus and Labuschagne, 2004). The success rate of ICT project implementation in Uganda is not well documented, but it is estimated below the regional average of 43% understanding that South Africa has more resources relating to ICT project implementation, compared to Uganda.

For the last 30 years of the 20th century, Information and Communication Technology for Development (ICTD) have faced a high failure rate, partly due to poor management and poor project design. Additionally, a well defined and well balanced (interplay) among the key elements of a successful ICTD project are people, process and technology (Macapagal, (APCICT), 2010) .At the world level, failure of ICT projects has been linked to; lack of clarity about roles, responsibilities and requirements, lack of definitions and managing project requirement and failure to communicate these from project sponsors, poor design and implementation among others (Ritter, 2007).

In Africa, lack of awareness about any project benefits, mindset and fear of beneficiaries, lack of clear process and lack of clear perception have been cited as some of the key reasons for failure of ICT programs and projects in Africa (Tusubira et. al., 2001). Also lack of funding for ICT projects, poor network infrastructure and unaffordable ICTs, have been cited as the key challenges to Uganda' ICT successful implementation of ICT projects (Rwangoga & Baryayetunga, 2011). Successful project implementation should address several attributes which include, project integration, project scope management, project time management, project cost management, project quality management, project human resource management, project communications, project risk management, project procurement management, otherwise the chances of failure is high whenever anyone of those attributes are not addressed properly (Duncan, 1996). The commonly assumed models of ICTs and development make certain assumptions which are grounded in technology determinism. This often ignores complex political factors influencing poverty and inequality at all levels to be hidden or go unhidden. ICTs and development discourse have to be rethought and this is likely to change the way ICT projects are designed (Wilson, 2003).

Teaching-Learning Environment

Though majority of teachers involved in the teaching of ICTs have positive attitudes towards the importance and the general role ICT can play in education and the integration of ICT in the educational process, there are parameters that make teachers cautious or skeptical about ICT integration in educational practice. There is also need to develop effective strategies for learning. It is important to understand that technology, effective teaching, a good curriculum, learning technology through use, social connection and desired goals are important in an ICT learning environment. Environment acceptance of ICT projects in developing countries contributes to the success of ICT projects. ICT projects should not be designed as a self-sufficient unit but rather as a process interaction with the environment within which it is being implemented. Stakeholders in education need to effectively collaborate and contribute towards creating the infrastructure and environment which results in a conducive learning environment. Student participation in learning cannot be assumed. Deliberate strategy, planned intervention, formative assessment and group presentation are needed to increase their participation (Dart, 2006; Rozendal, 2003).

Rural schools can improve their learning environment by engaging in active Place –Based Knowledge acquisition, which essentially encourages students in schools to actively interact with their environment (surrounding communities) rather than shut them out. It is well documented that success of schools benefit from involvement with the surrounding communities (Hohlfeld et. al., 2010; Shammah et. al., 2003). It is now recognized that community involvement is critical to the success of any developmental projects. Community involvement has proved benefits of nurturing ownership and self worthiness, sometimes counter fund contributions, from the community, security ideas and motivation. Implementers of Programs for development should be aware that as ICTs infuse in the lives of citizens, roles of individuals change both socially and psychology.

3. Methodology

The study employed both qualitative and quantitative paradigms. A cross sectional correlation survey design was used. The design insinuates that research instruments were administered to respondents and collected from them at once. The findings were then correlated among selected schools to come up with a generalizable position. In this study the target population involved the 156 pattern schools (Ministry of Education & Sports, 2011) and opinion leaders in the four regions of Uganda.

4. Findings

In as far as the school infrastructure is concerned the respondents assessed it as very satisfactory (mean=2.63); Whereas teachers to support the project being available was ranked highest (mean=2.49), the ICT teachers willing to support the project was ranked least (mean=1.93). In as far as the communication infrastructure is concerned the project was assessed as fair (mean=2.05). However existing bandwidth being sufficient was ranked highest (mean=3.38) and internet being secure (mean=1.07) was ranked last. In as far as the school security technologies is concerned, a very satisfactory response, on average.

Table 1: Summary of Level of Assessment of School's Capacity

Indicator	Mean	Interpretation	Rank
School Infrastructure	2.63	Satisfactory	1
Communication Infrastructure	2.05	Fair	4
Security Technologies	2.36	Fair	2
User Experience	2.33	Fair	3
Total Mean	**2.34**	**Fair**	

Table 2: Summary of Level of Assessment of School's Capacity

Indicator	Mean	Interpretation	Rank
Awareness among the surrounding communities	2.63	Satisfactory	1
The appropriateness of the implementation mechanism used by UCC	2.05	Fair	4
Total Mean	2.34	Fair	

Table 3: Relationship among school capacity, awareness of local communities and existing security technologies against successful project implementation in UCC

Category	Means	r-value	Sig	Decision on H_0
School capacity	2.34	0.78	0.000	Reject
Awareness of local communities	2.45	0.67	0.000	Reject
Existing security technologies	3.56	0.77	0.000	Reject

The results indicate that there is a significant relationship among the three study constructs (average r-value = 0.74). This position is supported by the means where respondents assessed the whole project implementation as satisfactory (mean=2.67). The results thus postulate that if school capacity is adequate; the targeted communities aware; and security technologies adequately used the implementation of ICT Laboratory project would be successfully realized.

5. Discussion

The school infrastructure is such a key component in determining the success of any project that carries on in schools (Ayeni & Adelabu, 2012; Ben et. al., 2006). If space, furniture and ambience are insufficient or unfit it is highly probable that a project will succeed. The technological aspects of security leave a lot to be desired in that if the systems are not secure they are prone to intrusion and misuse which may tantamount to abuse and profound legal implications (Huseyin, Srinivasan & Hasan, 2009; Jon, 2006; Mayette, 2010). Every project involves several key stakeholders among which are surrounding communities, opinion leaders and learners. Such players require a keen level of involvement, without which they can easily fail the project; by rejecting or destroying it (Teddy, 2007; Tina, Albert & Ann, 2010; Victor, 2009; Wilson, 2003).

6. CONCLUSION AND RECOMMENDATIONS

UCC has a good intention of uplifting IT literacy but has failed to address pertinent issues like infrastructure, training, motivation and vigilance in security. The researchers thus recommend that training, involvement and motivations of stakeholders be considered vehemently.

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