Original Research Article

Reviewing the management procedures from a down-up approach to integrate ICT in schools to enhance work: A case study at a model school in Mauritius

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Mahboob Sooltan Sohawon*2
Yugesh Dutt Panday¹ and Abdoul Khabir Baxou¹

¹Ministry of Education and Human Resources, Tertiary Education and Scientific Research.
²Mauritius Institute of Education MIE.

*Corresponding Author Email: mssohawon@hotmail.com
Tel.: +230 5761 0202

The integration of ICT tools in the school environment is being canvassed by the Government of Mauritius as it is viewed as being the first step in the digitalisation efforts of the country’s services. This paper sets out to investigate teachers’ opinion in a model school about the integration of ICT in school and to feedback same for management concerns to redirect procedures to enhance work at school. This study is of particular importance as a bottom-up approach is advocated to fine tune management practices from the end users perspectives. A case study methodological approach has been used to suit the research design. Data has been obtained through questionnaire survey and interviews in the backdrop of documentary search. The raw data has been filtered and was graphically treated using Microsoft Excel 2010 and a statistical treatment of the data collected was interpreted usefully by SPSS Ver 16.0

Key words: Education development, Mauritius, ICT, model school

INTRODUCTION

The United Nation Educational Scientific Cultural Organisation (UNESCO) professes that Information and Communication Technology (ICT) can contribute to support the pillars onto which quality of learning and teaching rest (available at http://www.uis.unesco.org/Communication/Pages/ict-education.aspx [last accessed 24.3]). ICT can therefore find practical applications in the scenarios of education reforms in creating universal access to education. ICT in the field of education also holds the promises to help in the capacity building of teachers as they learn to use ICT tools to better the school’s service delivery. The importance of ICT has also been discussed in the literature from the point of view to make of educational management and administration more efficient (Anthony, 2012; Stuart et al., 2009; Williams, 2008).

In Mauritius, the use of ICT in education has gained greater impetus since the last decade when the Government through the Ministry of Education joined in regional initiatives such as the New Partnership for Africa’s Development (NEPAD) e-school programme (Ramharai and Goodoory, 2003). A few years later, Mauritius was amongst the few African states chosen to showcase the implementation of the SANKORE project which aimed to bridge the digital divide between Africa and the more developed countries in the education sector (Bahadur and Oogarah, 2013). Indeed the use of ICT as a tool in schools carries in it the promise to improve student achievement, extend access to schooling, increase efficiencies and reduce costs, prepare students for lifelong learning, and train them for a globally competitive workforce (Williams, 2000). However, amidst the furor which hails ICT as one of the means to cater for the Education For All country goals, there is a slow but yet growing literature to suggest that the inclusion of ICT in the educational landscape may have fallen short of its expectations over the years. There are many reasons which may account for this deficit but one prominent feature tends to put forward that school readiness factors such as willingness of the school administration to plan the integration of ICT in the working culture of the school may not have been canvassed properly (Pelgrum, 2001; Bingimlas, 2009).

This paper therefore comes at an opportune time as it
proposes to investigate how few critical school organisational factors such as school leadership, school e-facilities and teacher empowerment may be brought together to make way for the integration of ICT tools in the educational landscape of a typical state secondary school in Mauritius. It is here argued that until and unless the school administration is convinced about the potential that ICT tools carry and strives to work the integration of ICT in school from a bottom up approach; no further deployment of action plan will take place which will trickle down to classroom situations. The built up of school culture to encourage the use ICT tools in educational settings is established from management commitment to engage the teaching staff to do so. It is only then that other plans will follow to guide the use ICT tools in school through other supportive managerial actions such as evaluation and feedback.

The aims of this research

Taking into the consideration that policy makers at the Ministry of Education in Mauritius want to see the inclusion of ICT tools in the school environment as a significant opportunity (Jhurree, 2005); this paper sets out to investigate how a typical state secondary school plans and addresses the integration of ICT tools in its administrative routines to enhance service. In the wake of this school based strategic initiative, important questions will seek to address how the leadership style and potential of the school head can bring about the right synergy to pull resources together to integrate ICT tools in the administrative routines. This paper also attempts to build the case that an e-work culture in a school organisation must first be established from a bottom-up approach and same must be felt by teachers before they will show the interest and the need to use ICT tools in classroom situations. It is as well interesting to investigate how clear procedures and follow up actions need be explained and implemented so that teachers may make sense of their obligations. This paper has therefore limited itself to investigate the administrative tasks of the school to make the use of ICT tools prevalent at school. It has not sought to deal at all into the use of ICT tools in pedagogy or any curricular issues involving inclusion of ICT tools in lessons planning and teaching.

Literature review

The world is in the face of an overwhelming conclusion: students entering schools are already ‘digital natives’ and the modes of teaching need to change because learners are changing by growing up in a digital world (Lu et al., 2015; Bennett et al., 2008). There is therefore a strong case for schools to adapt to this reality and show up capacity to engage teachers and students in an environment where the tools used to organise learning processes should be as enticing. Schools must now take up the responsibility to build on this foundation to meet the challenges of the digital world in order to realize students’ full potential. Anderson (2010) sets out to plan the integration and adoption of ICT in school scenarios where distinct phases evolve systematically and build on each other to include ICT in the working environment of schools. Anderson (2010) particularly argues that before the ultimate ‘transforming’ stage is reached, schools at the ‘applying’ stage must have acquired ICT equipment throughout their organization and where school administrators use ICT for more organizational and management tasks.

School culture, leadership and planning for ICT in schools

Collis and Moonen (2002) remark that new cultures need to be created in order to respond to the opportunities and the challenges of the digital world. Although hard to define and difficult to put a finger on, culture is extremely powerful. This ephemeral, taken-for-granted aspect of schools, too often over-looked or ignored, is actually one of the most significant features of any educational enterprise. Culture influences everything that goes on in schools (Firestone and Wilson, 1985). School leaders from every level are the key to shaping school culture. Principals communicate core values in their everyday work. Teachers reinforce values in their actions and words. The role of school leaders in the crafting of cultures is pervasive as their words, their nonverbal messages, their actions, and their accomplishments all shape culture (Deal and Peterson, 1994; Peterson and Deal, 1998).

In the quest for conditions that support the integration of educational technology into schools, recent attention has been paid by researchers (Fishman and Zhang, 2003), policy makers (Zhao and Conway, 2001) and practitioners to the importance of technology planning. Technology planning or information and communication technology (ICT) policy planning is commonly referred to as the process of developing, revising and implementing a school technology plan that guides teachers and the school organisation in the integration of technology for teaching and learning (Baylor and Ritchie, 2002). In a technology plan, a school describes its expectations, goals, contents and actions concerning the integration of technology in education. Vanderlinde et al. (2012) argues that the above interest in school technological planning has not received much of attention since literature is sparse concerning how schools can develop their local ICT policy capacity and how to establish an ICT policy plan. However, research and findings so far by Tondeur et al. (2008) tend to show that a school ICT plan should not be the depository of the school principal alone. In fact, the ICT plan must be detailed out so that there is a shared meaning amongst stakeholders for ICT, and coordinating their relations and interactions in keeping with the school’s culture. Probably the preferred mode of leadership is the distributed leadership model where at school teachers are also called to participate in the process of ICT policy planning at school considering that the latter is a multifaceted phenomenon grounded in
school culture. ICT policy consists of different policy domains: vision development, financial policy, infrastructural policy, continuing professional development policy, and curriculum policy.

**ICT integration in the state secondary schools of Mauritius**

The Global E-schools Community Initiative (GESCI 2011) reports that the Government of Mauritius has been working on a programme to give students and teachers access to the most modern tools of learning and teaching, including IT. However, while schools have received some equipment, more needs to be done in terms of action and implementation. The Government has confirmed its determination to effectively steer the country into the global economy by developing a diversified, sustainable, knowledge-based economy and a highly trained and adaptive workforce in the 21st century (Ministry of Education and Human Resources, 2009). The Education and Human Resources Strategy Plan 2008-2020 of the Ministry of Education encourages initiative to bring in ICT as a strategic goal in schools. ICT in the Mauritian schools is not only meant to support pedagogy but intends to have far reaching impact on school planning and development as well. Despite the keen interest of the Ministry of Education in Mauritius is showing to integrate ICT in the daily routines of the school, yet it would seem that there is a gap between the ground realities and the expectations. Issaacs (2007) in the Mauritius country reports that stakeholders identified that the barriers to the efficient integration of ICT in organisations are the lack of a coordinated and coherent inter-organisational model of collaboration, communication and common vision of the Knowledge Society pillars. Ramharai and Goodoory (2003) in their assessment of the use of ICT in primary schools in Mauritius argue that good intentions and decisions taken by the Ministry of Education and Scientific Research (MoESR) in the field of ICT are not sufficiently grounded in Mauritian reality. The gap that exists between the reality in the field of ICT and what policymakers propose is sometimes so huge.

**METHODOLOGY**

A case study approach has been used to investigate how feedbacks from teachers to the head of school can enhance the integration of ICT tools in the work environment of a typical state secondary school in Mauritius to improve on service provided to students and stakeholders. For the sake of ethical consideration the school is named 'East Star College'.

To answer the research questions, a documentary search for policy documents from the Ministry of Education was carried out at the East Star College to establish the current policy advocated by the Government concerning the issue under investigation. A check list and an observation lists were also established to take stock of the ICT tools and equipment which already existed at school and which are now being used to help in the administrative proceedings. In addition, a survey was carried out using a questionnaire which was distributed to all the 64 teachers working at the East Star College. Data from multiple sources (e.g. interviews with school leaders at the helm of each department and ICT coordinators, focus group interviews with teachers) were gathered and analysed. A statistical treatment of the raw data obtained was done using SPSS Ver 16.0. While a Cronbach alpha test was conducted to check the reliability of the questionnaire, descriptive statistics using Microsoft Excel Ver 10.0 were used to establish the profile of the school workforce in terms of the analysis of independent variables such as age group and crude opinion polling with regards to the ease with which the school teaching personnel is at ease with Information Technology.

The research design has not evolved from specific hypotheses; rather the research questions have been investigated using surveys and interviews. The results obtained at each step of the research prompted further investigation using a positivist approach. Hence the researchers are concerned with gaining knowledge in this present case study which is objective using scientific methods of enquiry. Methods associated with this paradigm include surveys and collection of data which were given a quantitative treatment from the use of SPSS Ver 16.0

**FINDINGS**

East Star College has a history of 42 years of existence and over time, it has come to establish itself as a school which caters for the above averaged students. Today the school harbours some 853 boys' students and it welcomes 63 full time teachers spread in 14 departments representing various subject studies including Computer Studies which is offered to students at Cambridge Ordinary level and Cambridge Advanced level examinations. The school administration has left no stone unturned to bring in the necessary ICT tools in the school daily routines with funding from either the Ministry of Education or from the Parent Teachers’ Association. At this point in time, the school administration is well equipped with standard ICT tools such as emails, fax and web technology to retrieve, store and relay information efficiently. Following a central policy by the Ministry of Education, tablet PC has been distributed to all teachers teaching students aged 15-16 years to all state secondary schools in Mauritius in the hope that it this IT tool will enhance teaching and learning.

**Overall teacher profile of the East Star College with regards to use of ICT at school**

An overview of the teaching personnel shows that 43%
have 45 years or less and 57% has over 45 years (Figure 1).

The benchmark of 45 years has been taken as the majority if not all of the teaching personnel in this age group has had formal training in ICT either as a college or university students compared to the older generation. The feedback from these 2 different age groups will therefore differ in terms of ICT use at school as shown in Figure 2.

Figure 2 shows that all teachers aged 45 and below expressed ease with the manipulation of ICT tools while the response is more varied amongst the senior staff (aged above 45). The x-axis displays the likert response scale from 1 to 5 where 5 is the strongest response in the positive.

A Mann-Whitney U test was run to determine if there were differences in the ease to manipulate ICT tools for teacher aged 45 and below and those above 45(Table 1).

Distributions of the ease factor scores for the 2 age groups were not similar, as assessed by visual inspection. Median engagement score was statistically significantly
Table 1. Mann-Whitney Test to determine if there are differences between two age groups

<table>
<thead>
<tr>
<th>Age distribution</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease with IT tools</td>
<td>Less or equal 45</td>
<td>36</td>
<td>37.54</td>
</tr>
<tr>
<td></td>
<td>More than 45</td>
<td>27</td>
<td>24.61</td>
</tr>
<tr>
<td></td>
<td>63</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Test Statistics

<table>
<thead>
<tr>
<th>Ease with IT tools</th>
<th>Mann-Whitney U</th>
<th>Wilcoxon W</th>
<th>Z</th>
<th>Asymp.Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>286.500</td>
<td>664.500</td>
<td>-3.045</td>
<td>.002</td>
</tr>
</tbody>
</table>

a. Group Variable: Age distribution

Figure 3: Response from teachers about integration of ICT in school

![Figure 3](image.png)

Despite the difference in ease of manipulating ICT tools, all the teaching staff queried agrees that there is a strong need to integrate ICT tools in the school working environment as shown in Figure 3.

The x-axis displays the likert response scale from 1 to 5 where 5 is the strongest response in the positive.

Interview data will correlate well with the opinions of teachers that ICT tools are indeed vital in the school working environment including class situations. As would Mrs. Bhakloll of age 56 declare: “Despite some practical problems which I may face, I am convinced that ICT tools facilitate reporting as well bring life to classroom, where possibilities are offered to students to be more expressive through the digital gadgets. The students just love it”

Teachers however regret that ICT tools are not always available for all teaching to use at leisure. This is the reason why the majority of teaching personnel will have recourse to both manual and electronic means to prepare class work or submit reports.

Teachers’ opinion concerning central policy decisions concerning ICT in schools

With regards to the recent policy decision of the Ministry of Education to provide Tablet PC to teachers and students aged 15-16, teachers have been queried about the
relevance of same through a questionnaire survey. The raw data obtained has been treated using SPSS Ver16.0 Cronbach’s alpha is a measure of internal consistency and in this particular case a value of 0.734 is considered as being sufficiently robust (Table 2). An analysis of the item statistics suggest that teachers surveyed have been categorical about the central policy decision. In resume, is concluded that while teachers are willing to use tablet PC in class situation, yet they are rather critical of the way that the measure has been implemented. In particular we note strong resentment of teachers on the following fronts concerning the implementation of the tablet PC policy:

a) It does not seem that the Ministry has surveyed the school situation first before deciding on the implementation agenda

b) In consequence of gaps in the policy intentions and outcome, teachers wish for a complete review of the policy and would wish for an alternative project of the sort.

c) Teachers also admit that many colleagues may find difficulties in using the tablet PC softwares.

A focused group interview indicates that ground realities are indeed compelling and the Ministry ought to have planned the Tablet PC in phases: Mr Badegam mentions that "with no WI-FI and internet facilities missing at school, the tablet PC policy becomes a non-event"

**Perceived barriers to the integration of ICT tools at school**

A query of perceived barriers to the integration of ICT tools at schools was carried out through survey questionnaire and same has been analysed for internal consistency. A satisfactory Cronbach's Alpha coefficient of 0.687 (Table 3) has been obtained with revealing response from teachers. Amongst the most noted qualms from teachers are the lack of training and the access time to ICT resources at school. This implies that probably the Ministry of Education could do well to provide more ICT tools in terms of Personal Computers/laptop interface at school together with basic connectivity to internet and through WI-FI. It is argued that only then could teachers feel confident and inviting to integrate ICT in the teaching and learning interactions with students.

The issue of capacity building has also been stressed as an important determinant in enhancing the competence and skills of teachers. Properly manned in-service course and follow up should in principle be an asset to favour the

**Table 2. Cronbach Alpha reliability statistics on Government Policy on Tablet PC**

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>Cronbach’s Alpha Based on Standardized items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.725</td>
<td>.734</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item Statistics</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry must review the tablet PC policy completely</td>
<td>4.7460</td>
<td>.47411</td>
<td>63</td>
</tr>
<tr>
<td>Teachers do not know how to use tablet PC in class interaction</td>
<td>4.6032</td>
<td>.63601</td>
<td>63</td>
</tr>
<tr>
<td>As a teacher you would wish for an alternative to tablet PC</td>
<td>4.7460</td>
<td>.47411</td>
<td>63</td>
</tr>
<tr>
<td>Ministry planned Tablet PC well</td>
<td>1.7143</td>
<td>.68223</td>
<td>63</td>
</tr>
<tr>
<td>Ministry has surveyed the school before implementing tablet PC</td>
<td>1.4762</td>
<td>.56389</td>
<td>63</td>
</tr>
<tr>
<td>Teachers do not wish to use tablet PC in classrooms</td>
<td>1.4921</td>
<td>.61887</td>
<td>63</td>
</tr>
<tr>
<td>Teachers are using tablet PC to enhance teaching and learning</td>
<td>1.5873</td>
<td>.58571</td>
<td>63</td>
</tr>
<tr>
<td>Teachers are using tablet PC for storing past papers only</td>
<td>4.6032</td>
<td>.63601</td>
<td>63</td>
</tr>
</tbody>
</table>

**Table 3. Cronbach Alpha reliability statistics on Government Policy on Tablet PC**

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>Cronbach’s Alpha Based on Standardized items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.643</td>
<td>.687</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item Statistics</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of training</td>
<td>4.2344</td>
<td>.68411</td>
<td>64</td>
</tr>
<tr>
<td>Lack of confidence</td>
<td>3.7500</td>
<td>.73463</td>
<td>64</td>
</tr>
<tr>
<td>Lack of resource</td>
<td>3.5938</td>
<td>.60994</td>
<td>64</td>
</tr>
<tr>
<td>Access time to ICT resource is limited</td>
<td>4.0156</td>
<td>.74519</td>
<td>64</td>
</tr>
<tr>
<td>Analytical use of data collected not done</td>
<td>4.2344</td>
<td>.68411</td>
<td>64</td>
</tr>
<tr>
<td>Teachers’ resistance</td>
<td>2.5938</td>
<td>1.10868</td>
<td>64</td>
</tr>
<tr>
<td>Students’ resistance</td>
<td>19219</td>
<td>1.14510</td>
<td>64</td>
</tr>
<tr>
<td>Lack of technical assistance</td>
<td>4.0781</td>
<td>.78285</td>
<td>64</td>
</tr>
</tbody>
</table>
Table 4. Chronbach Alpha reliability statistics on the role of the rector for the integration of ICT at school

<table>
<thead>
<tr>
<th>Cronbash’s Alpha</th>
<th>Cronbach’s Alpha Based on Standardized items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.826</td>
<td>.842</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item Statistics</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rector should spearhead use of ICT at school</td>
<td>4.31</td>
<td>.704</td>
<td>16</td>
</tr>
<tr>
<td>ICT Coordinator at school</td>
<td>4.00</td>
<td>.730</td>
<td>16</td>
</tr>
<tr>
<td>Use of ICT to restructure school</td>
<td>4.19</td>
<td>.544</td>
<td>16</td>
</tr>
<tr>
<td>Rector needs minimum competency in ICT</td>
<td>4.50</td>
<td>.632</td>
<td>16</td>
</tr>
<tr>
<td>Use of ICT better learning experience at school</td>
<td>4.56</td>
<td>.512</td>
<td>16</td>
</tr>
</tbody>
</table>

development of digital Mauritius from grass root level.

The role of the school head to help the integration of ICT at school

The teacher community at East Star College is of the strong opinion that there need to be leadership at the helm of the school to guide the implementation of a strategy to integrate ICT in the school working environment. The survey carried out shows strong reliability and consistency of data with a Cronbach’s Alpha of 0.842 (Table 4)

Teachers relate their preference for a head of school who needs to have minimum competence in the field of IT and who is willing to delegate responsibility to an ICT Coordinator to implement the initiative. The latter is quite revealing: Though a strong leadership needs to be felt at the head of the school, yet teachers would welcome mediation. Teachers’ interview reveal that the integration of ICT at school should preferably be done in phase where teachers must be made aware of the role that ICT will play in school work and they are accustomed with the requirements of the demands.

Mr. Vincent aged 39 opines: “ICT is a tool and has a multiple use. Its adaptation to school environment is of interest and will surely help if colleagues are made aware of the particular use of ICT as a tool. Note that a lot of teachers bring along their laptops at school. It is time that the school environment be become more user friendly to ICT and its media. But I guess this means a lot of work.”

Indeed, the work impending on the school head is to have an ICT plan and bring about people to be aware of the vision and the way to plan the integration of ICT. A collegial approach will best serve the intention with support given to teachers to adapt to the exigencies. An in-service and hands-on training technique thorough interdependency amongst colleagues will best suit the designs. Management responsibility is therefore highlighted to develop team work with colleague teachers where the work culture at school is hinge on interdependency and collegial efforts for school development. In the wake of management effort, notions of distributed leadership to teachers would them seem to become an interesting feature at school.

DISCUSSIONS AND RECOMMENDATIONS

From policy decision to ICT integration at school

Jhuree (2005) remarks that the successful integration of any technology, thus ICT, into the classroom warrants careful planning and depends largely on how well policy makers understand and appreciate the dynamics of such integration. This present research has shown that the Ministry of Education could have been more thoughtful and systematic in its planning to integrate ICT tools in school. As argued by Kenny (2001), If funding is the limiting factor to provide a proper and in-depth outlay for the use of ICT tools in pedagogy in school, the latter should not be compounded with politically-motivated promises and misjudgement of the and scale that the project in fact required. At East Star College, teachers clearly show a disaffection to the Tablet PC policy and would wish for a better alternative for the above same reasons.

Hammond (2014) noted several reasons why the adoption has been a challenge at school level. In particular he noted lack of access to ICT equipment, location of the machines and access to technical support. The same situation seem to be experienced by the teachers at East Star College

At the level of the school, Levine (1998) entrusts the responsibility of the success of the integration of ICT to the administrative head and his team who must plan ahead with a needs analysis and management activities. In the absence of proper planning any initiative is doomed to slow progress or outright failure. The involvement of all stakeholders in the preparation and execution of the plan has been identified as a catalyst in the integration process. The plan should be produced, not for the sole purpose of putting technology in the classroom but to reflect the real needs of schools in order to make effective technology deployment and to produce enhanced learning environments.

Still relevant today is a three-phased approach to the
process of systematic planning and implementation of computers in schools formulated by Cheever et al. (1986). The three phases include strategic planning, management control and operational control. At the strategic apex institutional goals are established at the level of the Ministry of Education’s level where necessary resources are provided to the schools. In a second order, management control will be in the hands of the head of school for the deployment of resources to meet the requirements. Management control will also mean that teams are established in a working culture which will secure the organisational targets. At the operational level teachers are called in to use the ICT tools as per in house policies to maximise on the resources.

The deployment strategy with the right leadership approach at school

True to say that each school as an organisation is unique and is characterised by its vision and core values and beliefs which will mark its purposes. The effectiveness of an organisation thus depends on the extent to which people perform their roles and move towards the common goals and objectives.

Oakland (2011) argues that the key to organisation success is concerned with moving the focus of control from the outside to the inside of individuals, so that everyone is accountable for his/her own performance. Hence Oakland (2011) champions notions of Total Quality Management (TQM) as the means to an end to walk an initiative comfortably with the participation of people in a binding work culture. TQM has been discussed to be also a way of ridding people’s lives of wasted effort by bringing everyone into the processes of improvement, so that results are achieved in less time (Badri et al., 1995; Black and Porter, 1996).

Controls, systems and techniques are very important in TQM, but they are not the primary requirement. It is more an attitude of mind, based on pride in the job and teamwork, and it requires from the management total commitment, which must then be extended to all employees at all levels and in all departments. Here a collegial and participative approach to management is encouraged with the head of school acting as a facilitator and a mentor to bring in the best out of the team members. The distributed model of leadership certainly pays dividend as the school head identifies an ICT coordinator who is an IT trained personnel taking leadership in guiding and managing the ICT implementation procedures at school. Peer coaching amongst colleagues is certainly a feature which will need to be encouraged.

Proposing an integration plan for ICT at East Star College

Developing a technology plan is a dynamic process that needs continuous improvement (Gülbahar, 2007). To put differently, writing a technology plan is a process of going through different steps. Based on a developmental research project (Vanderlinde et al., 2010), five steps are distinguished: (1) gaining insight into teachers’ vision of good education, (2) making an inventory of the actual use of educational technology, (3) setting priorities, (4) considering new activities and (5) drawing up an action plan. The three last steps require frequent iterations to assess if the goals are being met and to evaluate if the policy plan needs revision. The first two steps do not need much revision as the schools’ vision on the nature of good education is considered to be relatively stable over time (Hermans et al., 2008). The five steps together point out that technology plans compiled for the context of education contain as well as strategic elements—e.g., knowing the schools’ ambitions or as operational elements—e.g. the steps taken to realise these ambitions.

Figure 4 compounds the philosophy of management practices which resonate with the Total Quality Management approach where the policy decision of the Ministry trickles down to school level and it is implemented through the provisions of the adequate resources at the site of the school. Management actions ensue and it has the responsibility to articulate the National policy into practical plans where the school lives the initiative through well-defined action plans where individuals are taken care of in a collegial effort. Hence a loop is defined where resources are managed and analysis carried out towards continuous improvement.

If TQM is concerned with the quantitative aspects of mobilising resources to implement action through established key performance indicators; the management attributions of the school head will also demand that support is provided through the right interpersonal interface in the working environment at school. The delegated responsibilities of the school head to an ICT coordinator make sure that colleague teachers are aligned to need of the initiative and support is provided through peer/ collegial interactions as colleagues learn from each other. Hence barriers to the integration of ICT at school are looked into and the issue of capacity building through an in-service and hands on approach.

CONCLUSION

This paper has put forward that policy planning from the Ministry of Education to integrate ICT in schools may certainly present a gap in its implementation if the school does not develop the right acumen and capacity to accommodate Government intentions. Teachers have expressed no resistance to the coming of ICT in the school scenarios but have wished that the policy initiative is planned well with the assistance of a school head who should be competent enough to develop the right managerial approach where there are visible elements of collegial action and support. In light of the feedback received from teachers, a management model has been developed where a Total Quality Management model has
been put forward to integrate notion of accountability through the TQM loop of resource allocation, implementation and review in the backdrop of a collegial action to be developed amongst colleagues. In the latter, peer collaboration and support join in management efforts to make of the policy of ICT integration in school a sensible venture. Research carried out by Piper et al. (2015) positively shows that the inclusion of ICT as support tools to implement National Curriculum agendas has yielded positive results in Kenya.

REFERENCES


