Principals' Scope of ICT Use in Curriculum Implementation in Public Secondary Schools in Kenya

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Abstract

The appreciation of school principals' leadership role in enhancing the use of Information and Communication and Technology (ICT) in recent years has driven many countries and institutions of learning in particular to focus more on their inputs in driving integration of ICT in education. The study sought to analyze the principals' scope of ICT use in curriculum implementation in public secondary schools in Meru County. The study sampled 211 public secondary schools from Meru County through stratified sampling technique. The sample comprised of 335 teachers, 1441 students selected through simple random sampling method and 211 principals selected through purposive sampling. Data collection was done through use of interview schedules, questionnaires, and observation checklists. Data was analyzed using descriptive statistics where qualitative data was discussed under suitable themes derived from the objectives of the study while quantitative data was analyzed using frequencies and percentages. The study established that the principals' scope of ICT use in curriculum implementation is minimal. The study concluded that, limited use of ICT by principals in teaching and learning has negatively affected their leadership role in enhancing the use of ICT in curriculum implementation. It recommended that the Ministry of Education should play greater role in developing and improving ICT pedagogical skills in principals to be role models in the use of ICT in curriculum implementation.

Keywords: ICT Integration, Secondary schools, School curriculum, Teaching, Learning

INTRODUCTION

Generally, principals have not embraced their new role of promoting use of ICT in secondary schools in Kenya, hence facing the challenge of harnessing human resources to implement ICT in education (Ndwiga, 2012). Investing in principals' instructional leadership is vital in order to respond to rapid changes in classroom environment brought about by the digital technology that involves integrating of ICT in education (Gurr, 2004).

In Kenya, ICT integration means the use of computers in storing, writing of notes, researching and recording of students result (Akomo et al., 2015). This implies that, little attention is given in the core business of ICT in school. Despite the central role occupied by principals in school, for a long time there has been little effort to promote instructional leadership role of principals in augmenting the use of ICT in curriculum implementation (Minae, 2014). The Kenyan government currently aims at improving ICT utilization in learning sectors to tap its reward (MOEST, 2008). Use of ICT is considered as key in improving the country economy as well as enhancing quality and efficiency in teaching though the process seems slow with schools still relying on tradition method of teaching (MOEST, 2008; Mutwiri, 2012). However, the Kenyan

government and private sector have been involved to reverse the trend and ensure schools embrace ICT in curriculum implementation (MOEST, 2008).

The study sought to establish the principals' role in instructional leadership in enhancing the use of ICT in teaching and learning. The study was prompted by the fact that several studies have underemphasized the role of school leaders in ICT integration in Meru County (Laaria, 2012). Specifically, the study was guided by the following key objective; to analyze the scope of principal's use of ICT in teaching. When the level of ICT use in teaching and learning is elevated, it acts as great catalyst to teachers. Therefore, by being role models principals will inspire teachers to utilize ICT in class (Joyce et al., 2013).

METHODOLOGY

The study employed descriptive analysis method through which data was collected on multiple cases from schools to build a body of quantitative and qualitative data. The data was useful in establishing the relationship and variations between ICT and teaching/learning processes, which is one of the advantages of using descriptive study design (Bryman, 2008). The study was conducted in secondary schools within Meru County in Kenya, a county of 1.4 million people. The school principals, teachers, and learners in Meru County public secondary schools formed the target population. There were 308 Secondary schools, 308 Principals, 2443 Teachers and 64528 students in Meru County. The study sample comprised 335 teachers, 1441 students selected through simple random sampling method, and 211 principals selected through purposive sampling. Data collection was done through triangulation, which made use interview schedule, questionnaire, and observation checklist. The data collected were analyzed by descriptive statistics. Qualitative data was discussed under suitable themes derived from the objectives of the study. While quantitative data was analyzed using frequencies and percentages. Results of the findings were presented in tables.

RESULTS AND DISCUSSION

To determine the principals' scope of ICT, use in classrooms, interview responses from principals, as well as questionnaire responses from teachers and students were analyzed. An observation checklist was used to gather information in classes from the various teachers.

Principal's Scope in use of ICT in Teaching/Learning in School

From information gathered using observation checklist, no principal was seen applying ICT in class or coming out of class carrying any ICT tool. For, instance in extra county school (EC8), the principal responded by stating the following,

"To be honest with you I have not used ICT in teaching although I would love to, but … even in my office I don't have any computer".

However, in some schools visited, principals had desktops or laptops but they were not necessarily used for teaching purposes as the researcher observed. For instance, eight principals were found using computers in their offices. A significant number of principals confessed that, they apply ICT mostly for their studies and not for teaching purposes.

From the interview, majority of principals have basic ICT skills in word processing and PowerPoint presentation that they used in teaching and learning. Most principals

confessed that the modest skills they had in the use of computer was generally acquired informally and not from formal training, making them unable to effectively apply ICT in teaching, supervising and promoting the use of ICT in curriculum implementation. This finding corroborates Miima (2014) who established that, Principals need more tailor-made in-service training and incentives to enable transfering of theoretical enthusiasm into practice.

Two principals were found using Closed-circuit television (CCTV) to run the school (one from a county school (CS15) and another from a National School (NS1). This implies that principals were eager to acquire skills, which have immediate benefit to them (Leach, 2008). A number of principals stated that they actually acquired basic skills to enable them use computer for the sole purpose of carrying out research and assignments for their studies.

Majority of principals interviewed indicated that they were not competent in ICT in curriculum implementation and therefore, rarely applied in teaching or lesson preparation. This implies instructional leadership will be highly compromised since teachers would not be consulting them in case, they had problems in class using ICT. This is due to the fact that, one way of effective modeling is to provide opportunity for teachers to learn from principals by observing how they conduct their professional duties and be freely available for consultation incase a teacher was in any difficult situations (Margaret, 2010). Hence, if teachers knew that their principals were competent in ICT, they would be confident to try out because they would be assured of support in case they encountered challenges in class. As indicated by Yildirin (2007), a competent principal with vision on ICT integration, was in a position to harness school resources and promote ICT integration in the school.

From the study findings gotten through analysis of information, using interviews with principals, majority of principals normally used traditional method during teaching. In county school (CS4) visited, the principal told the researcher,
"You have seen yourself there are no ICT facilities in this school for teaching so issue of compliance does not occur here."

This implies that principals were limited in their ability to offer meaningful instructional leadership in teaching using ICT. This is because as stated by Akomo et al. (2015), principals' use of ICT in class has a powerful motivation in giving teachers incentive to use ICT in class. Therefore, it is imperative for principals to embrace ICT in their teaching if the desire is to see their schools cultivate a culture of using ICT in curriculum delivery.

From the analysis of data gathered from principals, a number of them did not use ICT in communicating with parents on academic progress of their children. In addition, a couple of principals indicated that, they sparingly used ICT to communicate to parents. A good number of principals often used ICT to communicate academic progress of students to parents. However, few principals stated that, they used ICT very often in communicating to parents on academic progress of their children. From the findings, short messages service (SMS) was the most common method used by principals to communicate to parents.

This study also investigated the scope of principals' use of various ICT tools in teaching from students' perspective. The findings are as shown in Table 1.

Table 1: Responses of Students on the Level of Principals' ICT usage in School

Constructs	Students responses (in %)				
	NAA	R	U	O	VO
Principals level of using-computer lab	74.6	17.2	0.9	3.2	4.1
Principals level of using-desktop computer	74.8	8.9	2.4	9.7	4.2
Principals level of using-laptops	76.8	9.2	1.1	9.0	3.9
Principals level of using-video camera	92.1	2.3	1.3	4.2	0.1
Principals level of using-radio	90.9	5.3	0.2	3.3	0.3
Principals level of using-LCD projector	79.0	13.0	1.3	2.1	4.6
Principals level of using-television	78.1	5.8	1.4	10.9	3.8
Principals level of using-DVD/CD	76.4	10.0	2.2	8.4	3.0
Principals level of using-Video/cassette player	85.7	8.4	0.7	3.2	2.0
Principals level of using-interactive whiteboard	92.2	2.2	5.6	0.0	0.0
Principals level of using-smart phones	80.8	3.7	1.8	8.8	4.9

N=1337. Key: Not at all (NAA), Rarely(R), Undecided (U), Often (O) =4, Very Often (VO).

From the study, it shows that principals were not taking advantage of ICT tools available to teach. This implies that students in pubic secondary schools were disadvantaged because they were losing on the potential benefits accruing in learning using ICT. From the results, principals were not providing any role modeling to teachers.

Therefore, their use of ICT is based on their personal initiative and not due to leadership from principals. Lack of ICT usage might indicate that the principals were either not competent in ICT or were not fully sensitized on the importance of ICT tools' utilization in teaching and learning. This clearly indicates that there was need for training of principals to enhance their ICT skills. This will boost their confidence in using ICT. As Omwenga (2003) states, teachers who have acquired IT knowledge, use ICT more in teaching than those without these skills.

This is a worrying trend because despite various studies such as Minae (2014), Nyagorme (2014), Polizzi, (2011) and Tondeur (2008) supporting the vital role ICT tools play in enhancing learning, most principals in Meru County had not embraced ICT, for instance 74.8% did not use desktop computers at all in teaching. It is worth noting that ICT tools were not "extra" instructional materials but integral part of instructional tools to be used in day today teaching process.

To corroborate the principals' responses in the interview, teachers were requested to rate the level of principals usage of ICT in teaching. Result of findings is presented on Table 2.

Table 2: Responses of Teachers 'on level of Principals Use of ICT in Teaching

Constructs	Responses (%)				
	SD	D	U	A	SA
The Principal has been able to walk the talk in using ICT in curriculum implementation	29.9	24.7	17.3	21.4	6.7
The Principal is competent in using ICT in pedagogy	14.9	20.9	35.8	20.3	8.1
The Principal has been presenting lessons mostly in ICT medium	38.8	36.2	12.8	11.3	0.9
The Principal has been using ICT in communicating to parents on academic issues	34.9	28.1	11.9	18.2	6.9

N=335. Key: SD=strongly disagree, D=disagree, U=undecided, A=agree, SA=strongly agree.

From results of the study, 63% (34.9+28.1) of principals had not been communicating using ICT to parents about their children's academic performance. This generally

implies that school principals have not been using ICT in communicating to parents on students' academic issues. The results showed that principals were not showing the way to teachers in the usage of ICT. Thus, there isn't any motivation or incentive for teachers because modeling is a powerful way that principals could use to motivate teachers. It is therefore high time principals took a proactive role in ensuring ICT is embraced as a mode of instruction by taking the lead role in the same.

To corroborate information from principals and teachers, students' views were sought on whether schools use ICT to communicate examination results to parents. Students were expected to respond to the statement and presented using frequencies and percentages on various items.

Table 3: Students Responses on the Schools' Communication of exams Results using ICT to Parents

Forms of Communication to parents	**Frequency and percentage of responses from students**			
	Yes	418	No	919
	F	%	F	%
Phone Calls	13	1.0	674	50.4
Short message services (SMS)	365	27.3	206	15.4
Social media (Facebook, twitter and WhatsApp)	40	3	39	2.9
Total	418	31.3	919	68.7

N=1337

In addition, information was sought from students to inquire on the use of e-books and e-materials for assignments. The findings are presented on Table 4.

Table 4: Students Responses on the Use of E-Books and E-Materials for Assignments

	NAA	**R**	**U**	**O**	**VO**
Frequency	887	77	63	107	203
Percentage (%)	66.3	5.8	4.7	8	15.2

N=1337. Key: NAA=Not at all, R=Rarely, U=Undecided, O=Often, VO=Very Often

From the findings, 72.1% (66.3+5.8) of principals' use of ICT is not sufficient to offer the desired role modeling in school in enhancing ICT integration in curriculum implementation.

These findings concur with those of Ifeoma (2010) and Ajibola (2008) who established that principals did not provide high extent of curriculum instructional leadership and therefore, this might have adverse impact on curriculum and instruction in education for all. This means that the country is on a precarious position in tapping the gains of ICT knowledge-based economy (Mutula, 2008). While launching laptops for primary schools, the country Cabinet Secretary for Education noted that the programme would be escalated from primary to secondary school(GoK, 2016), implying that if principals will not have improved in their ICT skills and usage scope in teaching, the task of implementing the programme will face serious difficulties. Low scope of application of ICT by principals in school indicates that either there is lack of motivation or there is no will to integrate ICT in teaching. This implies that, most likely principals have no ICT pedagogical skills or are not conversant with ICT. Bangolu (2011) and Mohammand (2012) indicate that, Principals who were competent in ICT tend to use it more often hence encouraging teachers to use ICT in teaching. This underscores the importance of instructional leadership in enhancing use of ICT in teaching. As indicated by Kidombo et al. (2013), integration of ICT will only succeed if principals

were ready to use it and model their staff to use ICT in teaching. Therefore, there is need for more investment on development of ICT capacities in principals in order to enhance of ICT use in secondary schools. This will not only elevate principals' scope of ICT use but also encourage positive attitude in principals towards use of ICT in classrooms. Given that principals are means and implementers of ICT integration in teaching (Polizzi, 2011), they must do more to increase their competencies. Principals' ICT competence and frequency of use seem to have a role in fostering principals' supportive behaviors for such integration (Mulkeen, 2003). It is worth noting that principal's support for ICT integration in teaching is associated with their attendance to ICT training courses. This is consistent with Dawson and Rakes (2003) who established that technology training received by principals influenced ICT integration in classroom.

Similarly, Serhan (2007), found out that, training of ICT in school leadership promoted the positive attitude of the principal to introduce ICT in classroom. Principals should act role models for prospective teachers by using ICT. They can demonstrate their competencies and willingness to use ICTs in teaching. Principals, other than their basic ICT applications should be aware of other effective software such as tutorials and simulations and learn to use them to improve their courses in ICT-integration process (Yuksel & Zahide, 2009). Concurring with Bishop (2012), who found out that, some school principals were not competent in basic skills in ICT skills, it can be said from the findings of this study that, it is crucial for principals to invest more in acquiring ICT pedagogical skills. This is in agreement with Gurr (2010), who indicated that, present school leaders should demonstrate some basic understanding of ICT in order to perform their duties effectively and inspire the school community to implement it. It is only when principals understand their technology leadership roles and show better leadership and clear visions in ICT for learning, can motivate teachers to use the same (Creighton, 2003; Sandholtz, 2004).

Various studies such as Polizzi (2011) and Tondeur (2008) suggest that there was need to create understanding between principals, teachers, and other stakeholders on the role of ICT in class. Engaging teachers in the development of an ICT plan gives them the opportunity to reflect on the significance of ICT in teaching (Tondeur, 2008). Tang and Ang (2002) highlight the impact of creating awareness on ICT integration and suggest that, teachers should not be considered as wayward but as operationally inhibited participants. This study established that teachers generally believe principals are not role models in spearheading ICT integration in curriculum. Lack of role modeling by principals on the use of ICT in classrooms has affected ICT integration in schools within Meru County. Mutwiri (2012) reported low use of ICT in secondary schools. Therefore, if schools in Meru County aspired to enhance the use of ICT in curriculum implementation, principals should lead b byteaching using ICT.

Modeling of principals in the use of ICT in class is crucial. For instance, many of the principals, advocated that, modeling was one of the best ways to make teachers use technology, though in some cases the teachers did not have the same perspective as the principals (Kozloski, 2006). Yuksel et al. (2009) argued that, one of the three primary roles for the principal as technology leaders in elevating the use of ICT among teachers was role modeling. The National Council for Science and Technology (2010) describes modeling in the use of technology, supporting technology use in the school, engaging in professional and development activities that focus on technology and integration as the main tasks of technology leadership.

Attitude of Principal towards ICT Use in Teaching/Learning

The study found that, majority of principals believed it was not their responsibility to ensure that the school had the required ICT facilities while the minority believed it was their responsibility. The findings are similar to Tanui (2003) who established that principals have been trying to equip schools with ICT facilities for teaching. Further analysis of information collected revealed that, majority of principals do not believe that ICT in teaching was the way to go.

If schools have to make any progress in the use of ICT in teaching and learning, school leaders are required to have a different observation on the function of ICT in learning. This is because as illustrated by Gurr (2010) in their study, negative attitude of principals among other factors was a key factor that influences use of ICT in classroom during teaching.

In addition, analysis of information collected using interview schedules revealed that, majority of principals had tried to acquire ICT pedagogical skills on their own. This is rather surprising because with this high number of principals it would be expected that, the rate of using of ICT in teaching would be significant. This implies acquisition of ICT was not necessarily for teaching and learning but may be for personal use or other administrative purposes. For instance, in one county school the principal stated,

"I have some skills to enable me carry out my studies since I am pursuing a master's degree."

The studies revealed that, majority of principals did not feel at a loss when teaching without ICT. This implies that, either the principals had not appreciated the role of ICT in learning or they did not have enough ICT skills to feel sufficiently competent to use ICT in teaching. In their study, Wahlstrom and Louis (2008) revealed that, principals who were competent in ICT were more likely to use ICT in teaching and learning as well as being keen in seeing that their staff had embraced ICT in their classes.

The study findings revealed that, a significant number of principals were not willing to encourage teachers to use ICT in teaching and learning. This is consistent with other research studies that were carried out in various countries such as Tubin (2006) and Yildirin (2007) who indicated that few principals were keen in supporting their teachers in use of ICT in teaching and learning. Moreover, as meta-analysis and review of Yee (2006) research studies concluded, teachers teaching experience did not eliminate computer phobias and many experienced teachers display some uneasiness and mild concern in using computers. This might explain why use of ICT by teachers in Meru County was generally out of teachers own initiatives. For teachers to be more enterprising and enthusiastic in the use of ICT in class, encouragement from school principals is paramount. Tanui (2003) state that,

"In case of a school setting, the principal's encouragement to the use of ICT in teaching will allow collaborations between teachers within the school and also with other teachers in other schools plays a key role in bringing positive changes towards adoption of ICT in the instruction process." (p. 24)

Therefore, principals in Meru County need to do more to encourage teachers in order to escalate the use of ICT in teaching

Analysis of information collected revealed that, the bulk of principals were never available to assist teachers when in difficult situations while using ICT in curriculum

implementation. This implies that, teachers had no incentive or drive to use ICT in teaching. Principals' availability and accessibility to teachers for consultation when in need of help was a powerful force in enhancing the use of ICT by teachers. In their study, Yuksel and Zahide (2009) revealed that lack of concern by school leaders was a main barrier in the integration of ICT in education. Hence, school leaders must allocate time to support teachers to use ICT in classrooms.

This study found out that, most principals were not looking for any training opportunities for their staff. This might explain why uptake of ICT in teaching in Meru County was still low. For instance, in their study, Wagner et al. (2005) established that attitude of principals and behavior with regard to ICT in their schools had direct bearing on the attitude and behavior of teachers towards the use of ICT in teaching and learning.

To corroborate the principals' responses, teachers were asked to give information on principals' attitude towards use of ICT. The findings are presented on Table 5.

Table 5: Teachers Responses on Attitude of Principals towards ICT use

Constructs	**Teachers Responses (%)**				
	SD	**D**	**U**	**A**	**SA**
Keen on using ICT in T/L	25.5	16.4	16.4	28.7	13.1
Showing great interest on the use of ICT in school	15.2	13.7	7.2	54.0	9.9
Trust teachers when using ICT in T/L	21.5	6.0	17.6	40.9	14.0
Adventurers in trying new ICT skills in T/L	26.3	18.5	14.6	31.9	8.7
Encourages teachers to use ICT in T/L	28.4	21.8	14.9	23.9	11.0

N=335. Key: SD=strongly disagree, D=disagree, U=undecided, A=agree, SA=strongly agree

The findings generally revealed that by looking at those teachers who strongly disagree together with those who disagree there was a luke-warm attitude of principals towards the use of ICT in curriculum implementation.

This could have serious implication in the advancement of ICT integration in education since principals' attitude towards use of ICT is a powerful force in the success of ICT integration. When teachers are motivated, they can ensure full implementation of ICT in classrooms. Therefore, the low level of interest in principal's use of ICT in school is an indicative of failure to use the right approach in the integration of ICT in education, even though ICTs have been there for quite a long time. Since principals are the catalyst and agents of change in education reforms, without their input, education transformation envisioned from the ICT integration point of view will remain a mirage.

Based on the findings of this study, Sathiamoorthy et al. (2012), it can be further argued that, if appropriate instructional leadership skills were provided to the principals, they could easily lead teachers in ICT integration and more ICT enthusiast teachers would be generated translating to better students. As other scholars have argued, negative attitude of teachers remain one of the major challenges in the use of ICT in learning (Nyagorme, 2014). Therefore, positive attitude towards ICTs is widely recognized as a necessity for effective implementation. Principals with positive attitude towards usage of computers tend to influence the teaching by emphasizing the importance of ICT integration in learning (Nyagorme, 2014; Omollo, 2013).

From Wabuyele (2003), attitude affects the behavioral objective to use ICT or to make others use it. The attitude of the principals matters a lot more than that of teachers

(Pollizi, 2011). This implies that if there is to be a positive approach of ICT integration in curriculum implementation in Meru County, a lot has to be done in changing principals' attitude towards the same.

Studies such as Pan African Research Agenda (2011) have pointed out that if principals were not more empowered to use ICT their schools it would take a long time integrating ICT in education. Consequently, this would threaten the country's effort in bridging the digital divide. Lack of focus in instructional leadership in ICT integration and concentration on other areas such as development of ICT infrastructure, training of teachers, and electrification would be less unless more attention was paid towards principals' instructional leadership.

CONCLUSION

Public secondary schools in Meru County are not fully benefiting from the advantages accruing from the use of ICT in teaching and learning as a result Principals' scope of ICT use in curriculum implementation being minimal. This is because use of ICT in curriculum implementation in schools has a positive impact in teaching and teaches (Lee & Gaffney, 2009). As educational reforms throughout the globe continue to emphasize curriculum innovation and inventions, principals in Meru County being instructional leaders need to pay serious attention in leading the process of schools' implementation of ICT in the curricula. The place of ICT in education in 21st century is well known, it has become both an enabler and key driver of quality and efficient education (Macharia, 2013). It is indisputable facts that for country to position it at a vantage in competing for knowledge-based economy, it must integrate ICT in all spheres of life, the entry point being education (Kompf, 2005).Therefore, all effort need to be done by all stakeholders in education in Meru County by both national and county government to ensure the scope of principals' use of ICT in teaching and learning is enhanced.

RECOMMENDATIONS

Since instructional leadership is wanting, more should be done to increase pedagogical, leadership and ICT skills of school principals so that they can help in enhancing the use of ICT in curriculum implementation. Strategies include regular training for principals on ICT in education. In addition, the Centre for Mathematics, Science and Technology Education in Africa (CEMASTEA) needs to carry out more training programmes targeting principals on the role of ICT in curriculum implementation. The government needs to support/facilitate production of ICT instructional materials by Kenya Institute of Curriculum Development (KICD) and make them accessible to schools. The syllabus should be restructured to ensure it is more compatible with use of ICT in teaching and learning. It is important for government officials and agents should monitor and evaluate frequently the use of ICT in schools. This will facilitate change in attitude and shift focus from traditional to modern teaching methods among teachers and principals.

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