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Factors Influencing Principals' Leadership for ICT Integration in Public Secondary Schools Management in Bungoma County, Kenya

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Abstract
In this 21st century, there is global recognition of integrating Information Communication Technology (ICT) as a contemporary tool for best management practices. The Kenya government ICT Policy and strategy (2006) encourages ICT integration in school management for quality service delivery. The government further entered into partnership with development agencies and private organizations to promote ICT integration. By so doing, the government had at heart school principals to exact their leadership overseeing successful integration. However, despite the efforts, progress has been short of expectations. For instance in Kajiado County, 51% of teachers lacked Internet accessibility, 55% lacked administrative support for professional development in ICT while in Kakamega County, 61.9% of schools lacked ICT technical support and 57.1% had inadequately trained staff in ICT use. In Bungoma County, over 75% of public secondary schools have 1-10 computers and 25% have 11-40 and electricity installed. Even with this ICT infrastructure, principals' hardly integrated ICT in management due to deficits in operational budgets which raised questions on principals' leadership as key players in ICT integration hence the need for this study. This paper sought to determine factors influencing principals' leadership for ICT integration in PSSM in Bungoma County, Kenya. This study adopted Hasan (1998) Activity Theory which states that whole work activity is broken into three parts namely subject, tool and object. Descriptive survey research design was employed. The study population comprised of 272 Principals and 272 Deputy Principals (DPs) and 272 Director of Studies (DOS) Saturated sampling technique was utilized to select 245 DPs while simple random sampling technique was utilized to select 82 principals and 123 DOS. Data collection instruments were Interview Schedule, Questionnaire, Observation Checklist and Document Analysis Guide. Validity was ascertained by revising the instruments based on feedback from experts in the School of Education, Maseno University. A test re-test method was used and Cronbach alpha (α) reliabilities of the instruments which were above 0.70 threshold was therefore acceptable. Mixed methods approach was used in data collection and analysis. The study revealed that 62.2% of the respondents cited finance and administrative support and 64.6% cited attitude as factors influencing principals' leadership for ICT integration in PSSM. It was concluded that financial and administrative support was inadequate. The study recommended that MOE should increase its budgetary allocation and mount an in-service program on principals' leadership to enhance ICT integration skills.
Keywords: Factors, Influencing Principals' Leadership, ICT, Integration

1. Introduction

The development of Information Communication Technology (ICT) has come a long way with varying onsets on the global scene. According to Clark and Mayer (2003), computers made first appearance in schools in North Africa mainly for management back in late 1960s. Three decades later, ICT integration in management in various sectors gained a rapid growth based on its power to transform environments. However, the Millennium Development Goals Report (MDG, 2010) sounds a cautionary observation that there exists great variability in ICT integration between developed and developing countries. In agreement, the United Nations Educational, Scientific and Cultural Organizations (UNESCO, 2011 citing Kozma, *et al*, 2004) indicated that schools in developing countries are prone to more barriers in ICT use than developed. For instance, barriers in South America and Africa schools included inaccessibility to functional computers and Internet, lack of software, technical and administrative support, inadequate training for teachers and unreliable electricity supply. Similarly, UNESCO (2014) indicated that electricity is a major obstacle to ICT integration in education in India and several underdeveloped countries like Nepal and Cambodia where only 24% and 7% of secondary schools respectively had electricity. Conversely, in Malaysia and Armenia, all schools have electricity as a pre-requisite for ICT integration.

Singh and Muniandi (2012) observed that government's role in funding ICT in schools was found to be minimal. The study findings revealed that schools yet to integrate ICT in administrative activities lacked ICT infrastructure and adequate technical support. Since ICT integration is dependent upon principals' leadership to provide or receive administrative support for teacher professional development and resource acquisition among others, inadequacy and or total lack certainly constrain principals in the realization of Total Cost Ownership

(TCO).

In Africa empirical findings indicate that Public Secondary Schools (PSS) are to date still struggling to ensure successful ICT integration. Nangue, Creunen and Church (2011) opined that ICT infrastructure was core to ICT adoption in schools. However, principals citing a myriad of issues argued that donated computers were mostly old, nearly outdated and incompatible with current software use, 37% of teachers had inadequate ICT knowledge and skills while 51.9% cited lack of technical support. These factors had a bearing on successful ICT integration in management they complement each other.

In their study Adomi and Kpangban (2010) asserted that 64% of respondents cited limited/poor ICT infrastructure, 63% cited ICT policy on project implementation strategy, 61% cited inadequate ICT facilities, 47% cited high cost of ICT facilities while 57% observed that frequent electricity interruptions influenced application. The findings are a pointer that principals were unlikely to integrate ICT in management. The study recommended that the government ensures policy statements translate into practice and provide level playing grounds to ensure all secondary schools benefit from ICT.

In discussing barriers in the implementation of ICT in PSS in Sudan with a view to teachers' perspective, Abdelwahed (2016) study attributed lack of knowledge and skills among teachers, financial constraint, low Internet connectivity, lack of technical support and time to poor ICT implementation. The factors negatively influence implementation, create a wide digital divide and view principals as knowledge poor on TCO.

As Kamel (2010) would argue not long ago, penetration of ICT in developing countries was begged on the benefits of ICT in education and governments were expected to facilitate the course. Kenya as a developing country was influenced by the global technological trend in the increased adoption of several technologies for integration in management (EPZ, 2005). Down to schools, the concept of technology in developing countries comes with diverse demands on principals' leadership for ICT integration in management operations following the understanding that they hold key positions in the process.

Laaria (2013) study established that only 23.8% implemented ICT against a majority (76.2%) who were yet to. Besides, out of 76.2%, a total of 15.5% just like the Sessional Paper No. 1 of 2005 on policy framework for education, training and research (MOES&T, 2005) and MOE (2006) cited limited power supply and frequent outages as challenges facing ICT implementation in Kenya. Laaria observed that schools that implemented ICT did not identify electricity as influencing implementation per se which resonated with MOE (2006) that 75% of PSS in Kenya relied on alternative sources of power from grid lines or generators. Schools relying on generators or grid lines besides electricity introduced financial aspect as determining the source of power a school uses.

Nyanchoka, Matula and Kalai (2015) study revealed that principals' attitude influenced utilization of ICT as indicated by 75% of the respondents, 60% of schools utilized computer teachers while 40% involved technicians. The findings portrayed a picture that principals' attitude had great influence as key models and were not keen on hiring of qualified technicians hence reliant on computer teachers.

Mureithi and Zengele (2015) observed that according to Heads of Departments (HODS), resistance to change with a mean of 4.03 and age 3.86 were cited as key determinants in ICT integration among teachers and support staff. This implied that where there was resistance coupled with old age, integration was likely to be slowed down. In establishing accessibility to ICT facilities, the study revealed that 97.2% could not access Internet, photocopiers and surveillance cameras (91.7%) and scanners (88.9%). Services that require such ICT facilities were hit hard in terms of integration due to inaccessibility.

Operating room for ICT enhances integration in the sense that personal equipment could be used. Muriko, Njuguna and Njihia (2015) in their study noted that lack of room as indicated by 16.6% was one of the challenges in acquisition and maintenance of ICTs in schools. Room was associated with the high costs for establishment alongside insecurity issues. While the foregoing paints a picture of how ICT paradigm has been incorporated in developing countries, there is need to determine factors influencing principals' leadership for ICT integration in PSSM.

1.2. Statement of the Problem

The Kenya government has greatly invested in ICTs in education however sources indicate that other countries have posted up to 41% of ICT integration in school management and administration among others while Kenya posts below par performance. Public secondary schools in Bungoma County have recorded a considerable lack in ICT integration in management. This has been occasioned by factors such as lack of adequate financial resources to cater for the ever demanding technological advances in the market. In the process, schools which had computers earlier on, they had been rendered outdated and therefore incompatible with the current software. Principals have been operating on shoe string budgets and for this reason; they have been faced with lack of operating room to integrate ICT in other administrative areas in schools and financially incapacitated to hire qualified ICT technicians. To this end, the less techno savvy staff develops a negative attitude towards ICT integration. Most schools had computers however majority lack internet connectivity and the few connected were inaccessible. Many schools depended on electricity as a pre-requisite to ICT integration which was

available however the ever power outages frustrated efforts to integration. To this end, there was need to determine factors influencing principals' leadership for ICT integration in PSSM in Bungoma County, Kenya.

2. Literature Review

2.1. Financial Resources

There has been notable rapid growth in the introduction of ICT integration in schools' management characterized by changes to realize the 21st century technological demands. Principals are compelled to restructure processes to make integration happen with regard to professional output. However, the complexity of 21st century ICTs is undoubtedly expensive hence requiring colossal amount to fix it. The Kenya National ICT policy of (MOE, 2006) cites high costs of ICT as among challenges hampering adoption in most parts of Africa in education sector. Issues of finance are akin to ICT integration under the principle of TCO and principals' leadership that is heavily relied upon.

Laaria (2013) observed that respondents (93.33%) cited high costs of ICT tools as the main challenge. The issue of limited financial budgets borders weak principals' leadership knowledge of TCO for ICT integration. In Mue, Itegi and Kyalo (2014) study principals asserted that financial constraint was a major challenge facing application of ICT in administration in PSS. Principals were unable to invest in new ICTs, upgrade or maintain the existing ones to meet the ever changing technology standards and keep virus at bay. In Muchiri, Ndirangu and Kanori (2014) study respondents (20%) cited lack of computers and high maintenance costs as major obstacles to integration. This finding relates to financial constraints principals were faced with that eventually render them incapable of making any meaningful TCO in ICT integration. The study recommended that the MOE should come up with viable modalities to reduce the digital divide in terms of required ICTs. In an investigate study Musambai, Ndirangu and Mukhwana (2017) used Rodgers diffusion and innovation theory. The study established that lack of Internet; technical support and inadequate computers in schools were major challenges facing principals in integration of ICT. However such factors were not in isolation but associated with lack of finance to address the issues. The trio recommended that the government and other stakeholders support schools financially to address challenges hindering integration.

Mue, Itegi and Kyalo (2014) sample comprised of principals, computer teachers and students selected through probability and non probability procedures while the current study sample consisted of principals, DPs, DOS and CTs selected through simple random and saturated sampling techniques where the latter gives respondents an equal chance of representation. Muchiri, Ndirangu and Kanori (2014) used only questionnaire to collect data but did not use interviews, observation checklist and document analysis which provides an opportunity to obtain in-depth information and confirm the situation on the ground. Musambai, Ndirangu and Mukhwana (2017) used Rodgers diffusion and innovation theory while the current study used Activity Theory by Hasan (1998) to discuss the subject (principal), object (ICT integration) and tool (ICT).

2.2. Training in Information Communication Technology

Knowledge and skills in ICT provides self efficacy among staff to integrate ICT in management. Principals' leadership through staff development policy provides training and professional development in ICT in periodic or sporadic way. To equip teachers with ICT knowledge and skills, principals require technological skills and capabilities to influence positive outcome. Seyal (2012) preliminary study in Brunei revealed that professional development was a solid investment in technology integration and achievement of organizational goals. Administrators (92%) observed that they needed content intensive professional development in ICT to provide skills in collecting and analyzing data and use in administrative work (80%). Administrators had some considerable level of literacy but their expertise and skills to use email for communication was basically low. Even with training in ICT, to fast track the process include close contact with techno-savvy colleagues; sharing of knowledge and gaining support from the environment provide informal skills. Nangue, Creunen and Church (2010) case study asserted that 83.3% of teachers agreed that basic knowledge in computers through training enabled ICT implementation however; only 26.2% had formal training. If knowledge and skills were anything to go by, a very small group integrated ICT in management. Salawu (2012) study revealed that 80% rated inadequate training among teachers in both public and private secondary schools as a second constraint. Even with ICT infrastructure in place, teachers could not competently integrate ICT due to inadequate training. Study recommended posting of ICT qualified personnel to institutions, training and re-training of the unqualified.

According to Sessional Paper No. 1 of 2005, ICT literate workforce is the platform on which to develop a knowledge based economy. The sessional paper aimed at bringing Kenya to global competitiveness in this information age (MOES&T, 2005) through professional development. The paper provides ground for management to ensure rigorous professional staff development. Increasingly, ICT integration in management requires well equipped personnel with some form of training. According to Merireng and Koringura (2013) revealed that respondents (84%) agreed that principals' role in determining use of computers in administration includes enhancing staff training and development. Teachers were cognizant of the role of training in integration

which influences teacher confidence/ self-efficacy. Makhanu and Kamper (2010) study adopted Fullan (2007) management theory which stresses on capacity building and main aim being to lay out strategies that enhance effectiveness to minimize performance gaps. The findings revealed that principals 938.8%) lacked training in ICT, 43.6% had informal training while 33.7% had certificate level of training. Nangue, Creunen and Church (2010) sample size included principals, teachers and students and data was analyzed quantitatively. Sawalu (2013) used a questionnaire while the current study used mixed methods to collect more diversified information. Merireng and Koringura (2013) purpose of the study was to establish utilization of computers but did not determine factors influencing principals leadership for ICT integration in Public Secondary Schools Management (PSSM), a gap the current study attempted to fill. Makhanu and Kamper (2010) study adopted management theory (Fullan 2007) emphasizing capacity building while the current study adopted activity theory which stresses on subject, object and tool.

2.3. Administrative Support

Principals' leadership is central in the adoption of ICT in schools. Uncluer *et al* (2010) study revealed that use of ICT depended on principals' support by organizing in-service courses and updating the school website for faculty use. The administrative support could be diverse depending on school needs. Principals' administrative support borders positive attitude towards integration. To implement a program, it's incumbent upon the principal to hire personnel to support and manage ICT infrastructure. This requires the principal and the larger staff to be ICT savvy given that ICT is an essential component in organizational management processes. This finding held convergent views with Gronow (2007) on principal's role to support ICT in school organizational processes. Principals are required to exert their innovativeness in sourcing for resources to ensure integration which consequently provides an enabling environment for team work. Kipsoi, Chang'ach and Sang (2012, citing Becta, 2003) identified lack of good models of good practice on ICT, lack of technical, administrative and institutional support as barriers to introduction of ICT. The barriers were further divided into school and individual barriers implying that they might not necessarily be about administrative support but beyond their limits. Principals' attitude towards ICT integration in management is closely associated with the kind of administrative support provided. Nyanchoka, Matula and Kalai (2015) observed that principals negative attitude towards ICT dissent providing required administrative support since to them ICT integration was no better than manual. They established that 75% of respondents held the view that attitude had an influence on administrative support principals provide. Nyachoka *et al* (2015) used only a questionnaire as an instrument of data collection which the current study used interviews, questionnaire, observation and document analysis. Kipsoi, Chang'ach and Sang (2012) reviewed literature which was secondary data while the current study used both secondary and primary where the latter could be verified.

2.4. Internet Connectivity

Ghavifekr, *et al* (2013) opined that the Internet and ICT in general had penetrated education systems globally and that Internet use in administration had the advantage of faster and easy communication among teachers through some social media platforms like Facebook, email and twitter. Besides, administrators accessed important data and online resources which portrayed a picture that the internet influences good administration and management operations. Data from most Sub Saharan African countries indicate that a good number of schools were yet to integrate ICT in schools or if any they are still at infant (Nangue, Creunen and Church 2010, 2011). The lack of ICTs was basically a hindrance to integration in management which was not attributed to school leadership since the problem cuts across nations. Kimuyu, Kalai and Okoth (2016) study adopted technology Acceptance Theory (Davis, 1989) and a conceptual framework and the sample size was determined through Krejcie and Morgan (1970). The study established that most schools 20(71.4%) were unconnected to the Internet hence not used in management like email for communication. Nyanchoka, Matula and Kalai (2015) study revealed that 65% of PSS were connected to reliable Internet while 35% were not. This facilitated high levels of Internet use in management activities among principals. In Muchiri, Ndirangu and Kanori (2014) study, 80% of PSS had no Internet connectivity which implied that even schools with computers that relied on Internet had a challenge unless other means of creativity applied. Kimuyu, Kalai and Okoth (2016) adopted technology Acceptance theory and also used a conceptual framework but did not use the activity theory which the current study adopted. Nyanchoka, Matula and Kalai (2015) and Muchiri, Ndirangu and Kanori (2014) studies used a questionnaire as a data collection instrument, the current study used mixed methods approach and the former employed simple random sampling technique but did not use saturated sampling technique which the current study used.

2.5. Technical Support

Technology is said to be expensive and characterized by complexities in use hence the need for technical support to manage unnecessary breakdowns. Tagalou, *et al* (2013) study revealed that although technical support was

important in ICT integration, 62.7% of administrators never offered technical support in their schools, 48.1% of administrators provided technical support through knowledgeable and skilled colleagues in informatics /computer, Private Corporation (37%) and students' parents (11.1%). The implication was that school administrators outsourced technical support rather than hiring. Oloo (2009) survey established that 71.9% of schools did not have an employed technician, 28.57% had, 25.9% outsourced for maintenance services through MOE funding, 3.7% benefited from Computer for Schools Kenya initiative while 18.5% depended on ICT trained teachers. Only few schools employed qualified technicians despite their valuable service for equipment maintenance and sustainability. Similarly Laaria (2013) established that 64.44% lacked technical support to oversee maintenance and repair of ICT equipment. Most schools did not have qualified technicians. Tagaluo *et al* (2013) investigated the significance of ICT use in public administration of schools while Laaria (2013) study about leadership challenges in implementation of ICT in PSS but did not seek to determine factors influencing principals' leadership for ICT integration in PSSM a gap that the current study attempted to fill. Oloo (2019) survey was carried out in primary, secondary and technical institutions while this study was conducted in PSS.

2.6. Access to Information Communication Technology Equipment

The geographical set up and socio-economic status of an institution determines accessibility to ICT equipment. The success of ICT integration in schools is dependent upon hardware and software availability and accessibility to users. Despite great improvement in telecommunication infrastructure in Tanzania, Internet connectivity was limited to few schools in urban areas yet majority of registered schools were located in semi urban and rural settings. Accessibility to ICT infrastructure was mostly limited by poor ICT network coverage especially in rural Tanzania (Swarts & Wachira, 2010). Poor connectivity to government ICT infrastructure influenced availability and accessibility as well. Teachers' accessibility to ICT as a determinant for integration in management at various levels is subject to discussion. Kiptalam and Rodrigues's (2010) study established that 98% of teachers accessed computers, 82.7% Internet, 73.5% computer in labs, 29.6% in principals' office, 12.2% in library and 25.5% in their lounge and offices. The level of access to ICTs was guided by availability which was not an issue. Makhanu and Kamper (2012) posit that 63.3% of secondary schools had electricity, 36.7% did not, 55.3% accessed computers as opposed to 44.7%, majority 84% had access to Internet/ email against 16% that never had, 8.5% accessed video/digital cameras while 100% had no access to surveillance cameras. These findings unveil the wide digital divide in principals' access to ICT infrastructure. Kiptalam and Rodrigues's (2010) study was on Internet utilization in both urban and rural schools with Internet connectivity and teachers formed the sample size while Makhanu and Kamper (2012) study was on the relationship between principals' access to ICT and school performance. In both studies none discussed factors influencing principals' leadership for ICT integration in PSSM, a gap the current study attempted to fill.

2.7. Power Supply

Electricity is a major pre-requisite for ICT integration to materialize however other forms of power supply like solar energy and generators would still suffice. Dionys (2012) observed that electricity infrastructure was the second issue affecting ICT integration due to frequent blackouts and poor wiring in classrooms hence affecting integration in class management. Oluoch, Ajowi and Bosire (2015) study revealed that 56% of principals, HODs, and secretaries, 53% of DPs and 47% of accounts clerks/ bursars cited lack of electricity as a factor limiting ICT usage in PSS. The findings were a signal that majority of schools lacked electricity as a requisite for ICT integration which could be linked to lack / inadequate finances to facilitate installation or principals' leadership. In a study Muriko, Njuguna and Njihia (2015) used stratified sampling technique to select respondents and the findings revealed that electricity was available but adequate in 77 (100%) of PSS. However, 85.7% of the respondents indicated that there was lack of back up like generators in case of power blackout which implied that although electricity was adequate in all schools, respondents were weary of blackouts. In Manduku, Kosgey and Sang (2012) opined that 28.6% of respondents cited lack of electricity as one of the challenges faced in ICT integration. Although respondents who cited power supply were few, without power supply, ICT integration is a challenge. Ojowi, Ajowi and Bosire (2015) and Muriko, Njuguna and Njihia (2015) used purposive sampling technique and stratified sampling technique respectively while the current study used both simple and saturated sampling techniques. Manduku, Kosgey and Sang (2012) survey was on adoption and use of ICT in enhancing management of PSS while the current study focused on factors influencing principals' leadership for ICT integration in PSSM.

2.8. Time Resource

Time is a valuable resource in the operations of institutional functions. Studies have shown that lack of time is a barrier to ICT integration in schools. Kyalo and Nzuki (2014) argued that lack of time for confident and competent teachers in the field or not, would hardly make use of ICTs. Where there is lack of time, ICT integration is marred with excuses and delays in work related activities. Various studies have pointed out the

issue of limited time in use of technology in educational institutions. Lack of time to integrate technology is a problem regardless of a country's development status similarly; it is a hindrance for teachers to use technology for integration in management, attend adequate training in ICT and plan on how to integrate ICT (Kula, 2010, Khan, Hasan & Clement, 2012). Time influences integration either way as Manduku, Kosgey and Sang (2012) argued, limited time is one of the challenges faced in the implementation of ICT. They indicated that teachers need adequate time to prepare material especially where they are required to convert hard copies to soft copies given their workload. Teachers (47.6%) cited time as a challenge they faced during ICT integration. Kyalo and Nzuki (2014) study was review of literature on determinants of ICT integration in tertiary institutions while the current study sought to determine factors influencing principals' leadership for ICT integration in PSSM.,

2.9. Attitude towards Information Communication Technology Integration

The integration of ICT in management fairly depends on the attitude of the user in various functions. People's attitudes towards new innovations are fundamental to diffusion. Han (2002 cited in Afshari *et al*, 2010) study established that principal's attitudes towards technology determines the extent to which computers are used. The introduction of ICT in PSSM is relatively new and varied attitudes accompany this change. A leader with positive attitude towards the success of ICT integration as Adu and Olatundun (2013) indicated, do benchmarking of schools that have good reputation for the establishment of an effective ICT system in management. The initiative broadens knowledge and ideas to positively rethink integrating ICT hence influence their attitude towards change. The principals' attitude towards ICT integration is a contributory factor for success or failure. Kimuyu, Kalai and Okoth (2016) study established that principals had positive attitude towards ICT integration. It was revealed that 85.7% indicated that integration of ICT in exam results analysis saved time and provided accurate work, communication with stakeholders through text messages and 46% observed that email was more official in communication than text message. However the trio argued that principals were negative towards some form of ICT as 32% viewed communication through text messages as rather none official while 64% described ICT infrastructure as costly for schools to afford. Depending on how one looks at it, these were indicators of either positive or negative attitudes where in the latter, principals find excuses not to integrate ICT. In a study by Menjo and Boit (2007) administrators and teachers were positive to ICT implementation in secondary schools as indicated by an overall mean of 4.06. While 60% of the respondents did not agree that teachers and administrators' roles changed, 40% noted changes. Further, 92.6% of teachers and administrators felt that use of ICT was fast in carrying out tasks, 95.7% thought it improved on work quality while 70% observed that it was less time consuming. Responses imply both teachers and administrators were positive about ICT use in administration. Kimuyu, Kalai and Okoth (2016) used a questionnaire only to collect data but as Zohrabi (2013) would argue, use of more than one data collection instrument supplements each other and by so doing boosts validity and dependability of data. Menjo and Boit (2007) study focused on challenges facing administrators in the implementation of ICT in schools that had introduced computers while the current study was scoped in PSS with or without ICTs.

2.10. Influence of Teachers' Age on ICT integration

Age of the school principals plays a significant role in successful integration of ICT. In a study on the influence of aging on the experience of ICT in United Kingdom, Medeiros, Crilly and Clarkson (2012) sought to explore the influence of aging on the experience of ICT products where respondents consisted of younger and older adults. Sampling was the respondents' own volition. The study established that older adults tend to develop a less positive relationship with products consequently; there was lesser integration of technology. To this end, there was a likelihood of less interest in technology, acceptability and adoption which creates barriers between the young and the old adults with abilities to wade through a digitized world. If such adults were principals, would hardly provide effective ICT integration in school administration.

Muchiri, Ndirangu and Kanori (2014) carried out a study on factors influencing school principals' integration of ICT in administration of PSS in Githunguri Sub County, Kiambu County, Kenya. Questionnaire was used to collect data. The study established that 80% of principals were 50 years and below. They interpreted age as a positive attribute and that it was the right age for principals to develop interest for effective integration of ICT in administration. A study was carried out on factors influencing principals' integration of ICT in administration of PSS in Kitui Central Sub County, Kimuyu, Kalai and Okoth (2016) used a questionnaire to collect data. Principals, DPs and SCDE formed the sample size. The study established that about 50% of principals and DPs were in the age bracket of 41-50. According to their interpretation, both the principals and DPs were relatively old to understand factors influencing principals' integration of ICT in PSS administration.

2.11. Influence of Operating Room on ICT Integration

The importance of operating room could be traced on the item ICT users' accessibility of the equipment. The principals' leadership as they initiate the change process under the principal of TCO should more often than not

consider room where ICT integration would take place. Inaccessibility to infrastructure includes operating room in which ICTs could be accessed. Almaghlouth (2008) study revealed that lack of suitable place for ICT integration like resource room and ICT lab fully equipped with ICTs was lacking. This implied that even with adequate ICTs lack of room was a barrier as teachers could hardly access ICTs for lack of room. Nangue, Creunen and Church (2011) study established that both public and private secondary schools considered putting up ICT labs to enable accessibility to ICT equipment. Such innovativeness was associated with lack of room for every member in the school to integrate ICT. In Muriko, Njuguna and Njihia (2015) study, only 2(16.6%) of the respondents indicated lack of room as a factor influencing principals integration of ICT in administration which implied most schools had adequate room to facilitate integration of ICT. The trio opined that there was a whopping 11(91.6%) schools where lack of finance was a major barrier to integration implying that even those with adequate room the issue of finance was alive. Almaghlouth (2008) study, Nangue, Creunen and Church (2011) study was on guidelines for successful integration of ICT in public and private schools, Muriko, Njuguna and Njihia (2015) study investigated factors hindering utilization of ICT in administration while this study sought to determine factors influencing principals' leadership for ICT integration in PSSM.

3. RESEARCH METHODOLOGY

Descriptive research design was adopted and the design was appropriate because according to Cohen and Morrison (2000) the survey research gathers data at a particular point in time and use to describe the nature of existing conditions. This study was carried out in Bungoma County, Kenya. The study population consisted of principals, Deputy Principals (DPs) and Director of Studies (DOS) and sample size selected through saturated and simple random sampling techniques. Table 3.1 shows distribution of study population and sample size.

Table: 3. 1: Distribution of Study Population, Pilot Sample and Actual Sample Size

Respondent	*Study Population	Pilot sample size		Actual sample Size	
		f	%	*f*	%
Principals	272	27	10	82	30
Deputy Principals	272	27	10	245	90
Director of Studies	272	27	10	123	50

Source:** ***County Director TSC, Bungoma County (2014)

Methodological triangulation approach was adopted. Interview guide, questionnaires, observation checklist and document analysis guide were instruments of data collection. The instruments measured influence which was about respondents' perceptions. Face and content validity was determined through experts in the area from the School of Education Maseno University and their comments were incorporated in the instruments to make them viable. A test re-test method was used for piloting of the instruments where 10% of the study population was adopted as suggested by Hill (1998), Isaac and Michael (1995) and Treece and Treece (1982). Reliability was determined by Cronbach alpha (α) with value set at .70 threshold and therefore acceptable (Table 3.2).

Table: 3. 2: Cronbach Alpha (α) Indices

Respondents	Instruments	R	IR	R+IR	Computation	Reliability Interpretation
Deputy Principals	Questionnaire	20	7	27	α=0.740≈0.74	Good
Director of Studies	Questionnaire	25	2	27	α=0.925≈0.93	Excellent

Key: R=Relevant, IR= Irrelevant, R+IR=Relevant plus Irrelevant

A mixed methods research approach of both quantitative and qualitative because of their compatibility and could be used in a single study (John &Christensen, 2004 cited in Makhanu & Kamper, 2010). Quantitative data was analyzed using descriptive statistics with aid of SPSS version 16 and excel spread sheet. Qualitative data were transcribed and categorized according to themes and subthemes as they emerged and results presented in form of tables, graphs, frequency counts, percentages and mean score. According to Piel (1995), in data analysis, percentages have a considerable advantage over complex statistics. Necessary ethical considerations such as confidentiality, anonymity, voluntary and informed decisions were observed. Sanders, Lewis and Thornhill (2012) opined that informed participants make voluntary decisions and consent either to take part in the study or not without any form of coercion. The guiding principles of research on acknowledgement of any published sources of other authors used in any part of the article to avoid plagiarism (Kothari, 2004) were observed. Primary data was presented with objectivity regardless of discrepancies to paint a true picture on the ground.

4. Results and Discussions

4.1. Instruments Return Rate

Table: 4. 1: Interview and Questionnaire Return Rate

Target category	Target Number	Return rate	(%)
Principals	82	82	100
Deputy Principals	245	212	86.5
Directors of Studies	123	106	86.2
Total	**368**	**318**	**86.4**

Observation checklists and document analysis guides were used in all 82 (100%) sample schools designed for interviews with principals. Total return rate of questionnaires (8064%) was commendable enough to be relied upon since it was above 70% which Berg (2004) describes as good.

4.2. Demographic Characteristics of Respondents

4.2.1. Respondents' Age

Table 4.2: Respondents Age

Age bracket	Principals		DPs		DOS		CTs	
	f	%	*f*	%	*f*	%	*f*	%
Below 30	0	0.00*	3	1.4*	5	4.7	56	20.7
30-34	0	0.00*	21	9.9	17	16	57	21.1
35-39	0	0.00*	46	21.7	47	44.3*	69	25.6*
40- 44	22	26.8	84	39.6*	27	25.5	47	17.4
45-49	35	42.7*	45	21.2	6	5.7	24	8.9
50- 54	18	22.0	7	3.3	3	2.8	13	4.8
55 and above	7	8.5	6	2.8	1	.9*	4	1.5
Total	82	100	212	100	106	99.9	270	100

*Major findings in each category

Table 4.2 is respondents' age which was important in management as different age present varied attributes with major implications on management. Age of the respondents was important to this study as Robins and Judge (2010) survey on the connection between a person's age and their level of embracing technological established that those in the Generation Y or as is commonly known as Millennial were said to be technology savvy. This implied that this generation had less difficulty with online communication. To this end, it was expected that relatively young principals, DPs, DOS and CTs would be more at ease integrating ICT in management than those in the home stretch of their career. Laaria (2013) observed that young teachers were likely to be more ICT savvy since ICT is taught as a unit in most tertiary institutions than before. Respondents in age bracket of 40 and above were believed to have adequate administrative skills and would embrace ICT integration

4.2.2: Respondents' Level of Training in ICT

Table: 4.3: Respondents' Level of Training in ICT

Respondents Level of Training in ICT								
	Principal		**DP**		**DOS**		**Total**	
Level	f	%	f	%	f	%	f	%
No training	52	63.4*	64	30.2	5	4.7	133	100
Workshop level	15	18.3	113	53.3*	68	64.2*	337	100
Certificate level	12	14.6	27	12.7	20	18.9	137	100
Diploma level	2	2.4	6	2.8	7	6.6	38	100
Degree level +	1	1.2	2	.9	6	5.7	25	100
Total	**82**	**100.0**	**212**	**100.0**	**106**	**100**	**400**	**100**

Table 4.3 is respondents' level of training in ICT. A technology leader who is not techno savvy might not understand the importance of ICT integration which would certainly affect their administrative support in school. The sporadic workshop level of training was inadequate to provide self confidence and efficacy in integrating ICT meaning majority of respondents were inadequately trained in ICT which could present a ripple effect on ICT integration in management processes. While majority of the respondents lacked adequate formal training save at workshop level, Nyanchoka, Mutala and Kalai (2017) argue that training is very significant in intensifying knowledge of principals on matters ICT and with specific attention to administration.

4.3. Principals' Responses on Factors Influencing Principals' leadership for ICT Integration

4.3.1. Influence of Financial Resources on Principals' Leadership for ICT Integration

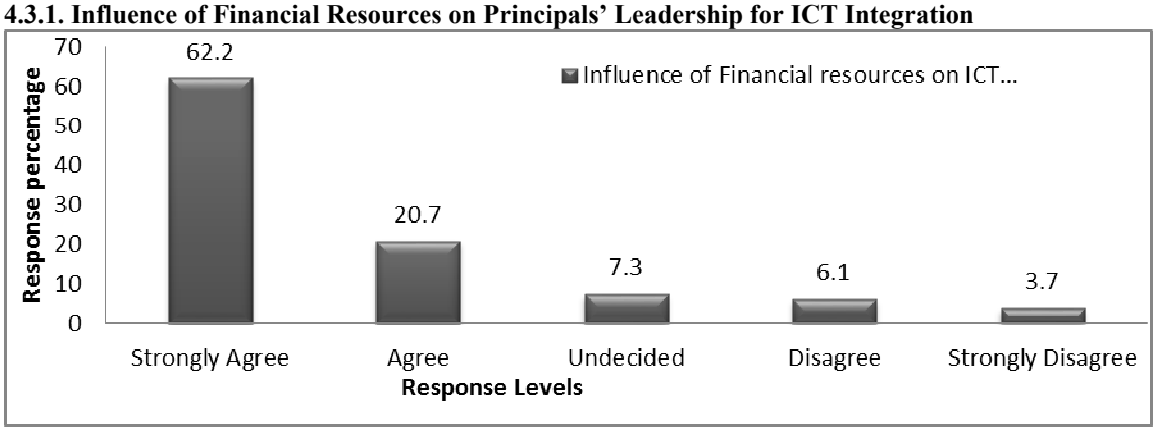

Figure: 4. 1: Principals' Responses on Influence of Financial Resources on Principals' Leadership for ICT Integration

Results in Figure 4.1 revealed that 51 (62.2%) principals strongly agreed while 20.7% agreed that financial resources positively influenced ICT integration. According to principals, financial resources positively influenced principals' leadership for ICT integration in PSSM. Majority (82.9%) argued that if there were adequate financial resources ICT integration would be made easier. Some principals observed "the school is still developing and without financial resources there isn't much I can do given that ICT in entirety is costly". This finding concurs with Kimuyu, Kalai and Okoth (2015) study which revealed that ICT integration in administration was constraint by inadequate financial resources to purchase ICT equipment 28(100%). Adequate financial resources in ICT integration cater for TCO; however, from document analysis many of the sample schools hardly adhered to TCO. A principal opined:

> "I have 20 computers, a printer, a modem and photocopier in school but I neither integrate all in management nor distribute to HODs, class teachers, stores and even library to name but a few. A lot more needs to be put in place first only when financial resources are available".

On the contrary 9.8% indicated that financial resources did not influence principals' leadership for ICT integration but depended on the immediate needs of the school.

Some argued that even with weak financial muscle, there was integration in management to some level but priority was mostly given to other pressing needs.

4.3.2. Influence of Training on Principals' Leadership for ICT Integration

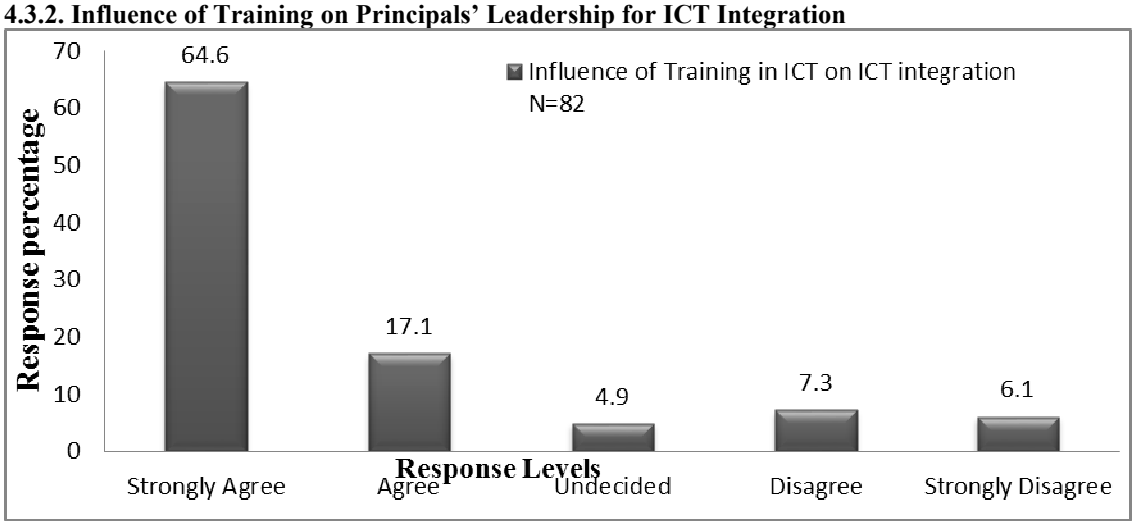

Figure: 4.2: Principals' Responses on Influence of Training on ICT Integration

On training as a factor, 64.6% of principals strongly agreed and 17.1% agreed which translated into a majority (81.7%) indicating that training positively influenced ICT integration while only 13.4% held divergent views. Principals integrating whatever form of ICT in management associated integration with training to enhance effectiveness based on self efficacy. Since most users were trained in computer, there was a likelihood of ICT integration. However, Musambai, Ndirangu and Mukhwana (2017) study revealed that 15(71.4%) of principals highest level of training was through experience. This meant majority were not trained in computer which possibly influenced integration even with ICT grants. While the present study shares similar views that

ICT training influenced desired outcomes some principals argued:

> "I don't have much ICT equipment to totally integrate in management besides, my teachers have no formal training but this has never stopped me from involving them in integration of ICT in management activities. They do it based on their informal training and peer support and they are good at it. To me training in ICT is not a question of life and death; it's the commitment and interest to do it and do it good that matters most".

Training comes in where technical expertise is required otherwise majority had hands on kind of experience. From staff development policy document in schools, very few underwent formal training save for workshop level which to some was inadequate in the ever incoming new technologies in the market.

4.3.3. Influence of Administrative Support on Principals Leadership for ICT Integration

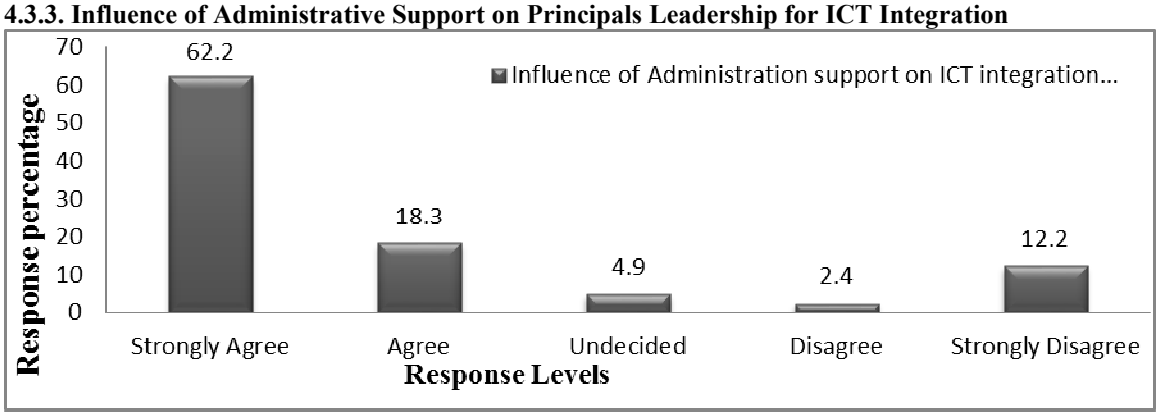

Figure: 4. 3: Principals' Responses on Influence of Administrative Support on Principals' Leadership for ICT Integration

There were 51 (62.2%) majority who strongly agreed and 18.3% who agreed that administrative support on principals' leadership influenced ICT integration. Administrative support with a majority of principals (80.5%) held the view that it had positive influence on principals' leadership for ICT integration in PSSM. The administrative support is two-way; from the MOE and other stakeholders to support principals' leadership as well. In Musambai, Ndirangu and Mukhwana (2017) study, 86% cited involvement of stakeholders in financing ICT infrastructure in schools as the appropriate strategy to improve ICT use in educational management. This was a gesture of administrative support to principals and the school in at large. One principal observed:

> "I always try my level best to offer administrative support to ensure ICT is adequately integrated in management. I always convince BOM through PTA vote head by hiring computer teachers and out sourcing of technicians to provide necessary support, repair and maintenance. Teachers have free access to Internet, as a school we sponsor teachers for training on basics in ICT and through SMASSE. We should hold conversations to address the narrative that principals do not need administrative support to enable them provide needed support to staff"

This finding concurred with Papaioannuo and Charalambous (2011) study that principals too require support from MOE such as installation of management programs and technical support on repair and maintenance. Such support if not effectively addressed, efforts to integrate ICT were deemed to fail. Another principal observed:

> "I have given up on external support on ICT for my school based on past experiences. Through the Economic Stimulus Program (ESP), some schools were selectively given at least 10 laptops, printers and internet connectivity among others. Through Constituency CDF the same schools benefitted from at least 15 computers while some of us have totally nothing and they know. Tell me why is this?

Principals' administrative support borders positive attitude towards ICT integration. Program implementation is incumbent upon principals to hire personnel to support and manage ICT infrastructure and this requires ICT knowledgeable and skilled principal and staff given that ICT is an essential component in organizational management. This finding held convergent views with Gronow (2007) on principal's role to support ICT. Some innovative principals' source for resources to enhance integration and such support base provides an enabling environment for team work. Through observation data, it was revealed that some schools had enough computers but principals were not hands on to ensure every teacher used ICTs except for complain on lack of room and skills. This finding is supported by Nangue *et al* (2011) that MOE inadequately supported schools for ICT integration. Principals' leadership enhances ICT integration through self driven initiatives such as fund raising, School Income Generating Activities (SIGA) and exploring other avenues to acquire technology resources.

4.3.4: Influence of Internet Connectivity on Principals' Leadership for ICT Integration

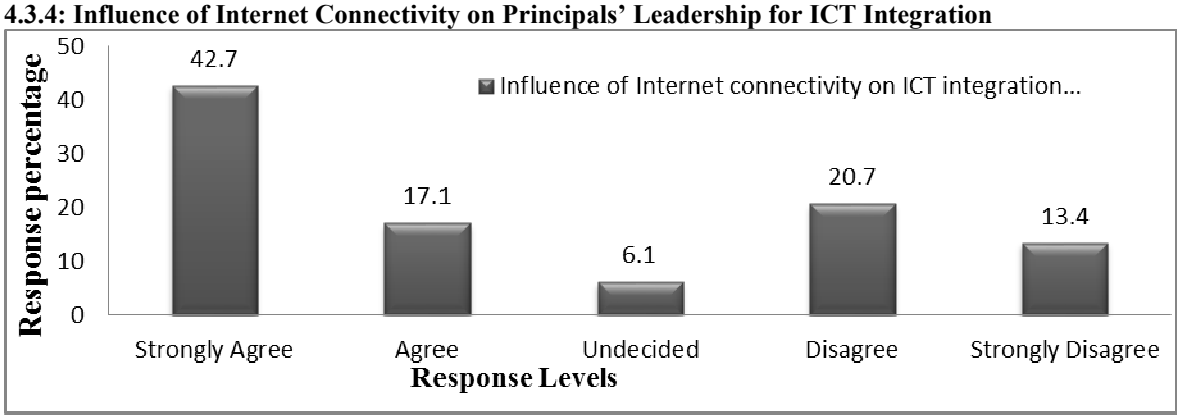

Figure: 4. 4: Principals' Responses on Influence of Internet Connectivity on Principals' Leadership for ICT Integration

Figure 4.4 results indicated that 42.7% Strongly Agreed while 17.1% agreed amounting to 59.8% posit that Internet connectivity positively influenced principals leadership to integrate ICT while 34.1% indicated negative influence. An enlightened school leadership has the command of technology in this digital era which was evident in this study that Internet connectivity had a positive influence on principals' leadership for ICT integration. Despite majority responses being in the affirmative, there were complaints of unreliable Internet connectivity and TCO implications. Data from observations and document analysis suggested dysfunctional Internet connectivity in many schools or none installation due to high costs and in considerations on TCO. While Damkor, Irinyang and Haruna (2015) concur with this study, most schools were unable to have Internet connectivity because of high cost implications. On the contrary, Nyanchoka, Matula and Kalai (2015) observed that, 65% of schools had reliable Internet connectivity which was attributed to government support for better services through email and browsing.

4.3.5: Influence of Technical Support on Principals' Leadership for ICT Integration

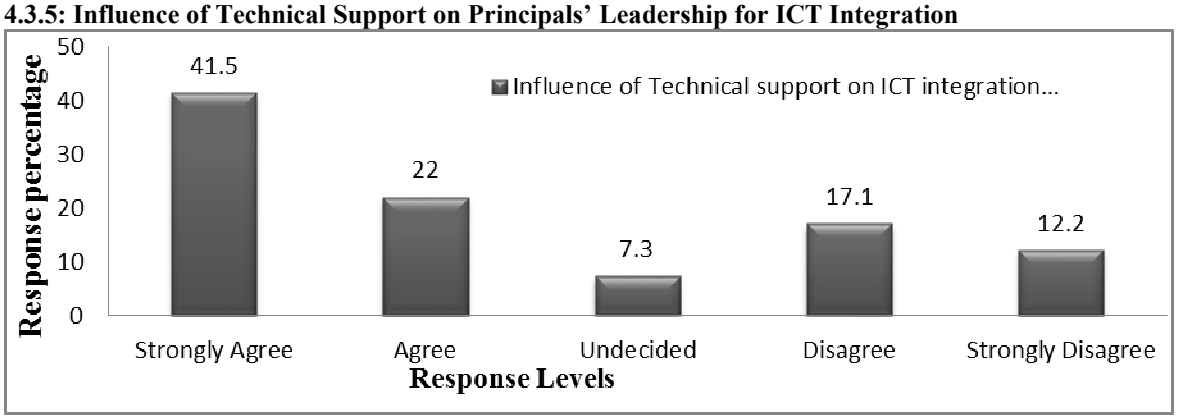

Figure: 4. 5: Principals' Responses on Influence of Technical Support on Principals' Leadership for ICT Integration

Results indicated that 34 (41.5%) Strongly Agreed that technical support influenced principals' leadership to integrate ICT. The variable on principals' leadership for ICT integration could not be over-emphasized. Majority of the respondents' (63.5%) views were convergent with Yilmaz (2011) assertions that schools with hardware and internet connections required technical support to oversee repair and maintenance for sustainability. A principal observed "All our six computers and a printer broke down and we are yet to get a technician to repair. This has paralyzed our ICT services in management functions in my office, DP's office and accounts office yet very crucial areas." This explains the valuable role technical support provides if schools hired or outsourced knowledgeable and skilled technicians. However, minority (29.3%) stated that technical support did not have an influence on ICT integration so long as strict ICT code of conduct is observed. This minimized virus and troubleshooting problems that discourage users for fear of equipment failure. Document analysis revealed that schools hired certificate level holders who were less qualified technicians and in isolated cases of diploma holders because of the high remunerations demanded.

4.3.6: Influence of Accessibility to Principals' Leadership for ICT Integration

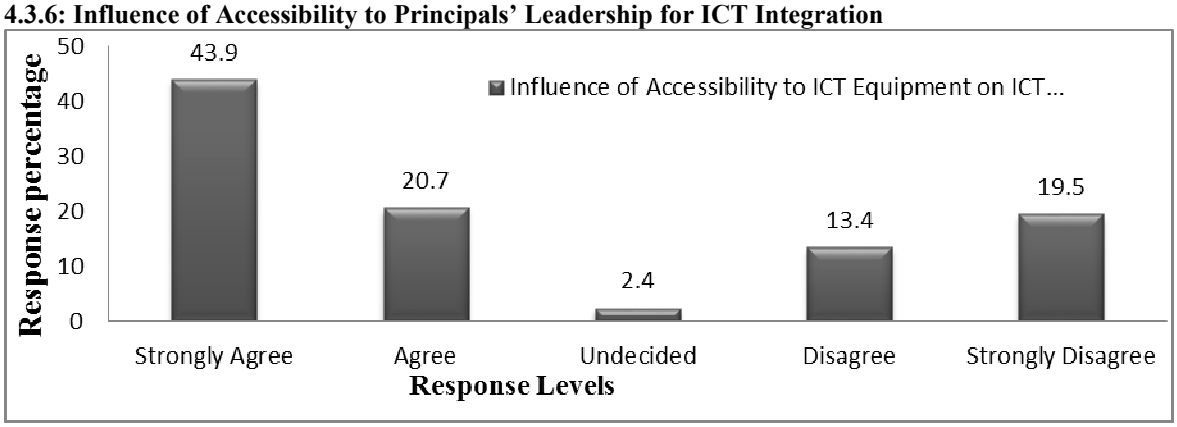

Figure: 4. 6: Principals' Responses on Influence of Accessibility to ICT Equipment on Integration

Principals' indicated that 43.9% strongly agreed 20.7% agreed which cumulatively is 64.6% that access to ICT equipment positively influenced principals' leadership for ICT integration in PSSM. They noted that accessibility to ICT saves on time and enhances teamwork. For effective integration of ICT, accessibility to ICT hardware and software are a requisite for convenience. However a total of 32.9% of respondents on the contrary argued that with or without access to ICTs, it all depended on the users' ICT knowledge and skills, attitude, interest and acceptability to change. In some schools, personal cellphones were the only ICTs accessible while other ICTs were accessed from cyber cafes. Improved availability and access to ICT was associated with schools' affordability of such resources and vice versa hence digital divide theory. This finding concur with Afshari *et al* (2010) findings that levels of access to ICT were significant in determining ICT use in schools but disagreed that ICT accessibility means availability in schools. A principal from a fairly ICT endowed school observed:

> "All teachers access computers and Internet when they individually enter marks in the computer and use the Internet at particular times in the presence of the computer teacher in the lab. The DPs and DOS each have a computer in their offices and if need be, CTs still accessed. All these have made the whole staff ICT savvy including the untrained".

From observations and document analysis, it was evident that no school had a computer per class teacher in all sample schools however majority accessed those available in various subsystems in school or from outside school.

4.3.7: Influence of Availability of Power on Principals' Leadership for ICT Integration

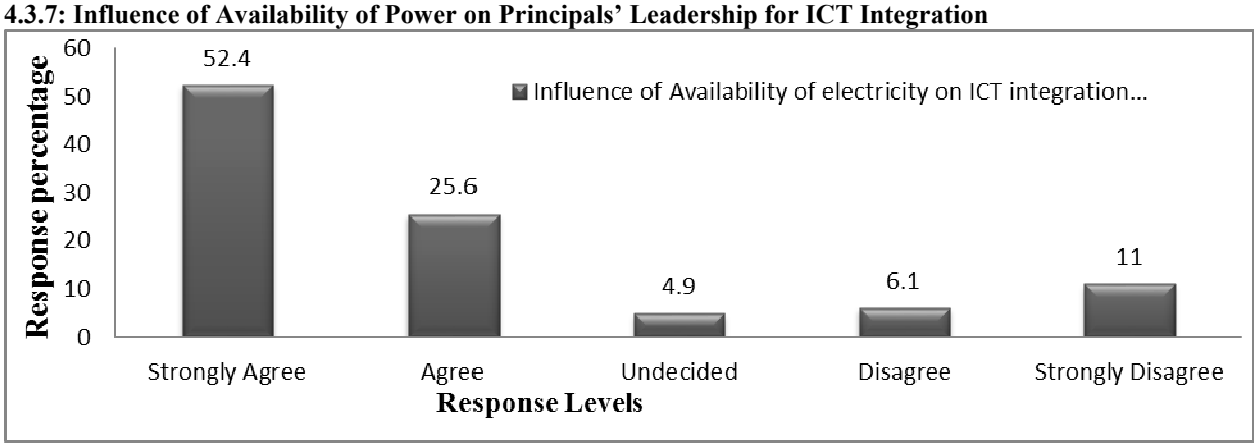

Figure: 4.7: **Principals' Responses on Influence of Availability of Power on Principals' Leadership for ICT Integration**

Results in Figure 4.7 indicated that 52.4% strongly agreed while 25.6% agreed which translated into 78% indicating that availability of power positively influenced principals' leadership for ICT integration. With rural electrification, observation data revealed that majority of schools had power installed with 70.7% having functional electricity but the undoing was irregular supply. The high percentage of electricity in schools was an indicator that with electricity, ICT integration was easy only and when required ICTs were available and accessible. On electricity one principal observed:

> "I am aware that we don't have computers other than Cellphones and flash disks in school but two of my teachers have laptops which have been assisting us. If we had electricity or even generators, this could conveniently be done in school but we can't afford given the demanding needs of the school like physical infrastructure".

This finding was in agreement with Ndungu and Nzuki (2013) study that use of generators to power computers was costly hence the need for Kenya Power to improve on regular and reliable supply. However unlike the duo, this study focused on how electricity influenced principals' leadership for ICT integration in management. While a total of 17.1% respondents did not find electricity as influencing principals' leadership for ICT integration, priority was acquisition of necessary ICTs. A respondent argued:

> "I have had electricity installed in this school for now four years yet I don't have a single computer. I still outsource ICT services which is really inconveniencing and costly besides lack of confidentiality. Generators are damn expensive, my experience in this school before electricity installation is still fresh on my mind"

This observation did not resonate well with Nyenwe and Ishikaku (2012) findings that in the absence of power supply, solar panels and generators would be an alternative source. Availability of power alone would not facilitate integration of ICT as other variables such as finance and ICTs are paramount.

4.3.8: Influence of Time Resource on Principals' Leadership for ICT Integration

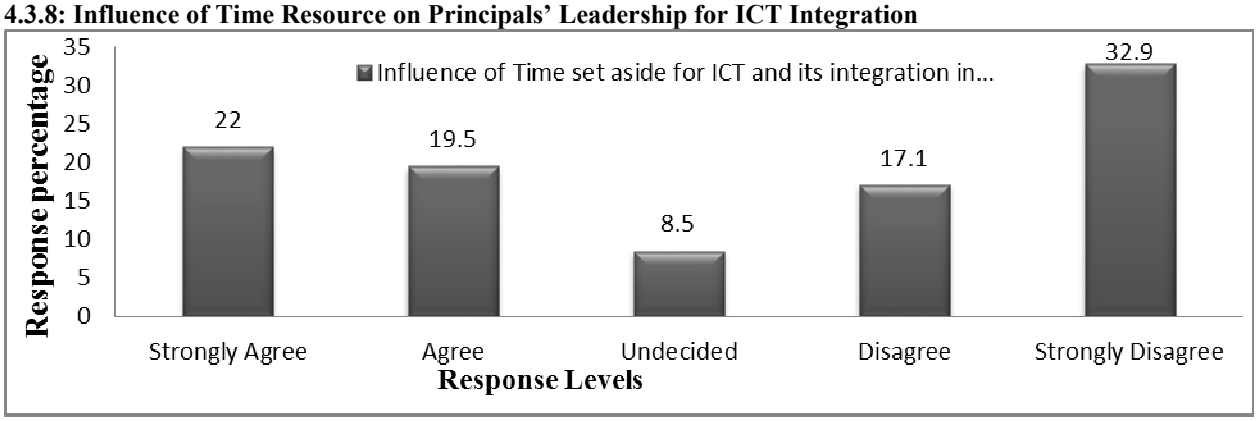

Figure: 4. 8: Principals' Responses on Influence of Time on Principals' Leadership for ICT integration

The results in Figure 4.8 shows 22% strongly agreed and 19.5% which sums up to 41.5% indicated that time positively influenced principals' leadership for ICT integration while 32.9% Strongly Disagreed and 17.1% disagreed totaling to 50% of the majority indicating time as negatively influencing principals leadership to integrate ICT. Some proponents of ICT integration put several factors as requisites for ICT integration at school level. Most principals argued that teachers had adequate time to integrate ICT as time used for carrying out management activities through pen and paper could be replaced with ICT. A principal asserted:

> "Instead of writing when setting exams, they can use computers to type the same work, instead of coming to see me in office individually, they can send messages using their cellphones or our school teaching Whatsapp wall (although we don't encourage this), communicate with parents/guardians through text messages, voice call or email, enter students' marks in the computer directly instead of writing".

Another principal indicated that through ICT and in this case use of a computer and management software, follow up of financial transactions and holding the accounts clerk accountable, was simplified. This means the principal ensured computers were in use at all times which saved such principal's time in solving parents' issues on finance. These were some manifestations that there was time and could be created to integrate ICT. On the other hand, some respondents observed that there was limited time due to understaffing hence too much workload with few available and functional ICTs. Document analysis data revealed that most Sub County schools commonly referred to as CDF schools were understaffed**.** One principal argued that even if there was time, the school had only one computer and a flash disk which couldn't serve all staff members. Time could be associated with staffing and accessibility to ICT hardware and software.

4.3.9: Influence of Attitude on Principals' Leadership for ICT Integration

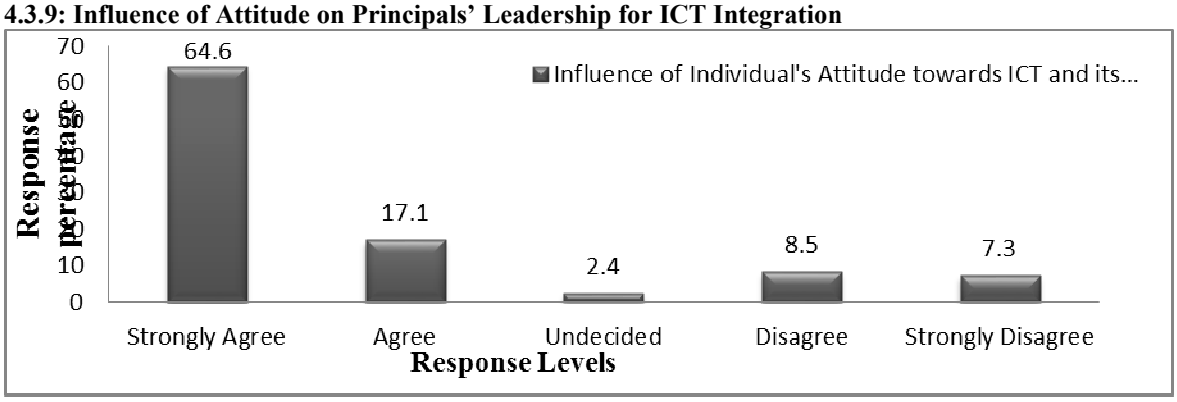

Figure: 4. 9: Principals Responses on Influence of Attitude on Principals' Leadership for ICT Integration

According to Figure 4.9, principals 64.6% strongly agreed, 17.1% agreed that attitude influenced principals' leadership for ICT integration in management. Most principals (81.7) opined that principals' attitude provides muscle for commitment to overcome barriers accidental or incidental. Minority 15.8% observed that attitude was usually an undertone signifying resistance to change and failure to spearhead integration by providing hardware and software as a form of support. The complexities, lack of external support and economic constraints schools face was enough reason for principals to develop negative attitude towards ICT integration in school management. Such define worlds apart in ICT integration in Bungoma County. Conversely, Musambai, Ndirangu and Mukhwana (2017) study established that 47.6% of principals cited negative attitude as influencing quality of educational management which received government grants.

4.3.10: Influence of Teachers Age on Principals' Leadership for ICT Integration

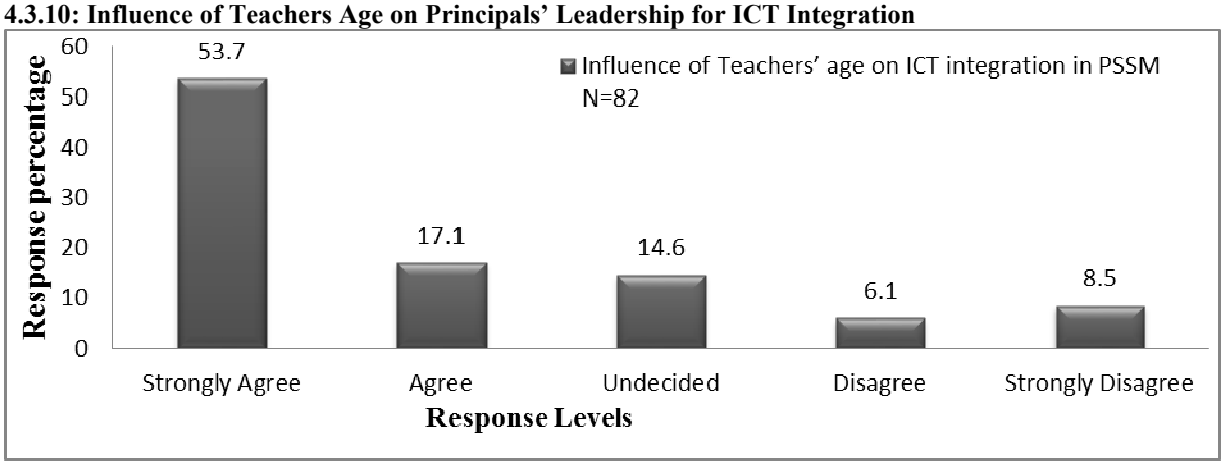

Figure: 4. 10: Principals' Responses on Teachers' Age Influence on Principals' Leadership for ICT Integration

Majority of principals 53.7% strongly agreed, 17.1% agreed amounting to (70.8%) asserted that age had a positive influence; while 6.1% disagreed and 8.5% strongly disagreed summed up to 14.6% who cited age as negatively influencing principals' leadership. Majority of principals about 42.7% were between 40-45 years old implying they could consider ICT integration based on the premise that introduction of ICT was close to their age bracket. A principal observed "Although I have not seen so much of a problem regarding age and ICT integration, sometimes the old teachers submit work late. However, the few in their 30s are sharp in integration and do assist us so much". Age and ICT could easily take different directions. This study was in agreement with Makhanu and Kamper (2010) where moderate association between principals' age and ICT literacy level was established. Age of the respondents was important because the responses in relation of utilization of ICT in administration would be assessed (Muriko, Njuguna and Njihia, 2015). According to Kavagi (2010) aged people were reluctant to embrace technological changes due to their familiarity with certain traditional administrative styles. Carnoy (2004) on the other hand observed that young teachers growing up in the information age embrace ICT easily and vice versa as those above 40 years were in schools before the introduction of ICT integration and required more training to keep abreast with new technological advancements.

4.3.11: Influence of Operating Rooms on Principals' Leadership for ICT Integration

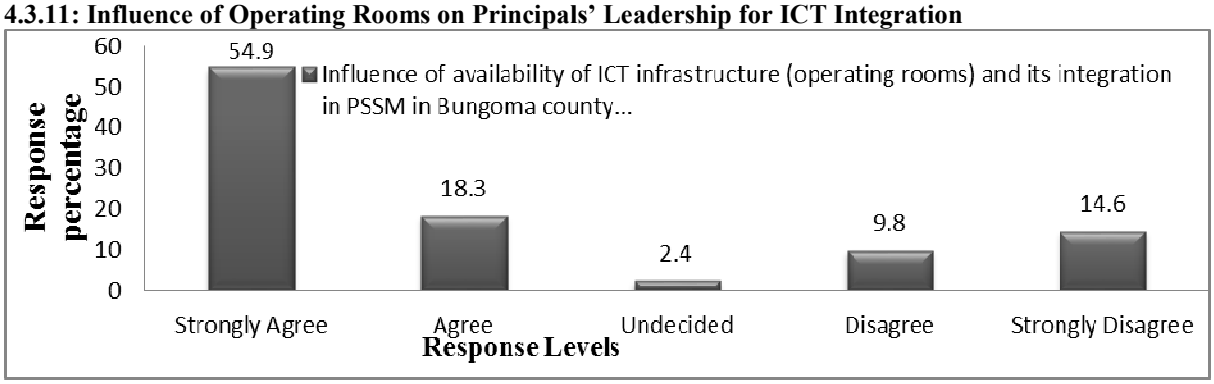

Figure: 4. 11. Principals' Responses on Influence of Room on Principals' Leadership for ICT Integration

The role of operating room to integrate ICT could not be over-emphasized. From principals' responses, 54.9% strongly agreed, 18.3% agreed which formed the majority (73.2%) that room positively influenced principals' leadership for ICT integration. Majority observed that there was need for room to enable integration in management but due to acute shortage of rooms; it was rather difficult for integration even where ICTs were available. From observations, 4.9% of schools had more than 30 computers but teachers couldn't access for lack of room. They oscillated between the staffroom and congested classrooms. A principal observed "I have 15 functional computers heaped somewhere for lack of room however, only the secretarial pool, accounts department and DOS squeeze themselves in their working rooms to use. Teachers set handwritten exams and forwarded to secretarial pool, very tedious". However, a paltry 24.4% indicated that room negatively influenced principals' leadership to integrate ICT. A principal observed: "Lack of room did not necessarily influence integration, because if i had basic ICTs, all teachers would do their stuff with issues".

4.4. Deputy Principals' Responses on Factors Influencing Principals' Leadership for ICT Integration

Table: 4.4: DPs' Responses on Factors Influencing Principals' Leadership for ICT Integration

(*n*=212)	S.A		A		U		D		S.D		
Factors influencing principals' leadership for ICT integration	*f*	%	*f*	%	*f*	%	*f*	%	*f*	%	MS
Financial resources	106	50.0	40	18.9	7	3.3	15	7.1	44	20.8	3.72
Training in ICT	150	70.8	36	17.0	5	2.4	10	4.7	11	5.2	4.74*
Administrative support	125	59.0	39	18.4	11	5.2	12	5.7	25	11.8	4.07
Internet connectivity	156	73.6	38	17.9	2	0.9	6	2.8	10	4.7	4.52*
Technical support	150	70.8	39	18.4	2	0.9	3	1.4	18	8.5	4.41*
Access to ICT equipment	133	62.7	43	20.3	9	4.2	11	5.2	16	7.5	4.25
Power supply	59	27.8	57	26.9	7	3.3	49	23.1	40	18.9	3.22*
Time resource	143	67.5	47	22.2	5	2.4	6	2.8	11	5.2	4.44*
Attitude towards ICT	121	57.1	57	26.9	4	1.9	11	5.2	19	9.0	4.18
Teachers Age	142	67.0	42	19.8	4	1.9	10	4.7	14	6.6	4.36
Room to integrate ICT	121	57.1	51	24.1	6	2.8	19	9.0	15	7.1	4.15

Table 4.4 is the DPs level of agreement on factors influencing principals' leadership for ICT integration in PSSM. The main factors cited were training in ICT which had the highest mean of 4.74, Internet connectivity 4.52, time resource 4.44, technical support 4.41 and power supply with lowest mean of 3.22. Financial resource is a critical component in implementation of school programs. Most DPs indicated that finance positively influenced principals' leadership for ICT integration and vice versa. Data from observation revealed that DPs offices were hardly with adequate ICTs due to school financial constraints. In the same breath data from interview and document analysis established that finance negatively influenced principals' leadership for ICT integration. This finding concur with Katulo's (2009) case study that financial resources were essential to initiate and sustain ICT integration since integration requires adequate funds to facilitate relevant infrastructural changes, safeguard equipment, ensure staff development and hiring of qualified ICT technicians to cover TCO. While DPs could be forgiven for simply standing safe grounds on school finances and possibly in the dark of what happens, data from document analysis revealed that DPs in some cases were involved in school financial matters. This study was partially supported by Mue, Itegi and Kyalo (2014) that DPs were not conversant with school financial administration since it was a docket managed by principals and accounts clerk. With a mean of 3.72 on a Likert scale of 1-5, it means financial resources influenced principals' leadership for ICT integration however knowledge of ICT costing which tend to align with Nangue Creunen and Church (2010) where principals were simply ignorant of ICT costing which to them ends at acquisition.

For effective ICT integration, it's just reasonable that teachers knowledgeable and skilled in the subject provide room for easier and effective integration. Most DPs observed that training positively influenced principals' leadership to integrate ICT in management as indicated by a mean of 4.7. On levels of ICT training, majority of DPs had workshop level of training (Table 4.3), experience difficult to integrate ICT. However, without training some fears were abound regarding accuracy of work which corroborates with Oguta, Egessa and Masiega (2014) findings where 60% of schools did not integrate ICT in accounts because of the unskilled ICT staff. This argument explicitly implied that ICT knowledge and skills are paramount to integration in DPs office. Administrative support at various levels indicated that majority strongly agreed and strongly agreed that there was positive influence on principals' leadership for ICT integration. The school leadership support in provision of appropriate ICT facilities and related infrastructure enhances effective application of ICT in administrative engagements. Principals and other school subsystems need administrative support to optimize ICT use in management functions. Data from document analysis and interviews revealed that principals through their leadership support ICT integration through capacity building, provision of ICTs, maintenance and encouraging use. Principals too received support variously but mostly through their own initiative such as proposal writing to stakeholders.

The DPs supported the idea that Internet connectivity positively influenced principals' leadership to integrate ICT as indicated in a mean of 4.52; however, data from document analysis indicated that few schools had Internet connectivity but dysfunctional as a result of poor maintenance raised issues of dependability. Nangue Creunen and Church (2010) observed that majority of teachers (54.3%) accessed Internet in cyber cafes, 25.7% in schools and 20% at home. Earlier on principals' interviews revealed that Internet connectivity was inaccessible and not reliable because of service provider inconsistent supply. This information was backed up by the document analysis data from staff and Board of Management (BOM) meetings. While it was clear that most schools lack Internet connectivity from service providers; Internet accessibility was through individual gadgets like modems and or cellphones. From document analysis, there were few schools with highest number of modems usually used by school secretaries and or DOS.

An impressive majority of DPs observed that technical support positively influenced principals' leadership for ICT integration in their offices with an overall mean of 4.41 on a scale of 1 to 5. Technology is characterized by complexities in use which requires technical support. Data from interviews and document analysis revealed that most schools hired less qualified ICT technicians or simply relied on computer savvy teachers due to high salary demands. However, Nyanchoka, Matula and Kalai (2017) study established that majority of schools relied on computer teachers (60%) rather than hired computer technicians (40%). Lack of hiring of ICT technicians was a drawback to principals in ICT integration and maintenance. Nangue, Creunen and Church (2010) study revealed that 85.4% of teachers were unable to use computers for lack of technical support which reinforces the importance of technical support in integration of ICT.

The geographical set up and socio-economic status of an institution among other factors determines user accessibility to ICT. Most DPs as indicated by a mean of 4.25 contend that accessibility to ICT equipment positively influenced principals' leadership for ICT integration in terms of usability as evidenced in a mean of 4.25 demonstrating the importance of accessibility. Conversely, Swarts and Wachira, (2010) asserted that in Tanzania, accessibility was limited by shortage of hardware and software plus poor connectivity based on government ICT infrastructure. Conversely, the implication in this study is that some DPs accessed ICTs in school through outsourcing. Data from observations revealed some schools had functional computers heaped somewhere in a room instead of putting them to use. Conversely, old and poorly maintained hardware /software greatly affect ICT integration because of dynamic technological changes. Data from observation, interviews and document analysis established that most DPs did not have ICTs in their offices but integrated through available ICTs or outsourcing.

Power supply and more often than not electricity is a requisite to ICT integration. The advent of rural electrification led to installation of power in most PSS. With majority supporting electricity as a valuable infrastructure, most schools (61.3%) had functional electricity save in isolated cases still in the process. According to Laaria (2013), 34.44% cited limited and unreliable source occasioned by frequent power outages harbor ICT usage. Data from document analysis, observation and interviews indicated no school depended on either generator or solar panel as alternative source of power. However the issue of frequent power outages was pointed out as hindering smooth integration. With a mean 3.22, electricity fairly influenced principals' leadership for integration.

Time factor is a valuable resource in any institution for successful running of activities which most DPs cited as important in ICT integration. There was an evident outcry among principals over understaffing hence overwhelming workload in most PSS. From the interviews and document analysis, it was observed that even with competent and confident teachers' use of technologies was minimal due to inadequate time. The idea of time again greatly affected DPs in schools without ICTs on material search and other management functions. With frequent power outages, Laaria, (2013) opined that ICT users would require more time to patiently wait for

power reconnections or technicians to guide the less techno savvy. Similarly, even with time but inadequate/lack of ICTs, without administrative support for accessibility and staff development, there was definitely less ICT integration. The DPs argued that time was deemed to be a valuable component for principals in ICT integration as indicated in a Mean 4.44.

Attitude cuts across school leadership and staff destined to integrate ICT in management activities. For instance, ICT user's attitude is twofold in that it could enable or disable integration process. Those who strongly agreed that attitude influenced principals' leadership were self motivated to integrate ICT in management. Although majority of responses were in the affirmative, it's at variance with Makewa, *et al* (2011) findings that with a mean of 2.98, principals' positive attitude with implemented computer studies was less compared to 3.11 who were yet to. This means that there were other factors to ICT integration than attitude which the current study aligns with. A mean of 4.18 in the current study was indicative of attitude as influencing principal's leadership although from the interviews and document analysis, principals and DPs had positive attitude towards integration. Nyanchoka, Matula and Kalai (2017) on the other hand established that majority of the principals (62%) argued that principals with positive attitude were skewed towards ICT use in administrative tasks than the 15% citing negative attitude.

On teachers' age majority responded in the affirmative that time influenced principals' leadership for ICT integration. Observations and document analysis established that majority of DPs were within an active age bracket of 35-39 years that would comfortably embrace ICT but the age of the principal too had a role. Age influences an individual's acceptance of change as Nangue, Creunen and Church (2011) opined most respondents did not associate with age as anticipated unlike this study where a mean of 4.36 portrayed positive influence.

Room to integrate ICT in management functions was cited by majority as influencing integration where DPs argued that there was need for room to facilitate integration. This study agreed with Muriko, Njuguna and Njihia (2016) study which established that 16.6% cited lack of room as a challenge towards acquiring and maintaining ICT infrastructure. With a mean 4.15, DPs made a clear statement that room to operate from positively influenced principals' leadership for ICT integration. Through observation, interviews and document analysis it was revealed that most schools lacked operating room for principals to integrate ICT in the DPs office.

4.5. Director of Studies' Responses on Factors Influencing Principals' Leadership for ICT Integration

Table: 4.5: **Director of Studies' Responses on Factors Influencing Principals' Leadership for ICT Integration**

(*n*=106)	S.A		A		U		D		S.D		
Factors influencing principals' leadership for ICT integration	*f*	%	*f*	%	*f*	%	*f*	%	*f*	%	M.S
Financial resources	61	57.5	17	16.0	9	8.5	10	9.4	9	8.5	4.05
Training in ICT	72	67.9	18	17.0	5	4.7	6	5.7	5	4.7	4.38*
Internet connectivity	18	17.0	74	69.8*	6	5.7	6	5.7	2	1.9	3.94
Technical support	76	71.7	20	18.9	2	1.9	3	2.8	5	4.7	4.50*
Administrative support	67	63.2	19	17.9	2	1.9	10	9.4	8	7.5	4.20*
Access to ICT Equipment	66	62.3	25	23.6	4	3.8	5	4.7	6	5.7	4.32*
Power supply	25	23.6	32	30.2	5	4.7	24	22.6	20	18.9	3.17*
Time Resource	65	61.3	21	19.8	5	4.7	6	5.7	9	8.5	4.20*
Attitude towards ICT	56	52.8	30	28.3	3	2.8	7	6.6	10	9.4	4.08
Teachers' age	69	65.1	19	17.9	5	4.7	7	6.6	6	5.7	4.30
Room to integrate ICT	68	64.2	25	23.6	3	2.8	4	3.8	6	5.7	4.37*

Table 4.13 results revealed that training in ICT had a mean of 4.38; technical support 4.50, administrative support and time 4.20, access to ICT 4.32, teachers' age 4.30 and room to integrate 4.37 as major findings. The study revealed that financial resources are central to ICT integration as indicated by a mean of 4.05 on a 1-5 Likert scale. Principals' are required to deploy resourcefulness and innovativeness to raise funds towards ICT integration. From interviews, observation and document analysis, ICTs in the DOS office like computers, printers and photocopier were through principals' leadership in sourcing for support from well wishers, MOE, PTA and CDF. The fast growing rapid changes and improvement in both hardware and software require colossal amount of funds for TCO.

Responses on training in ICT revealed positive influence on principals' leadership for ICT integration as in a mean of 4.38. This implied that without training it was tricky for principals' to consider integration. Demographic information in this study revealed that most DOS (64.2%) had training at workshop level in ICT meaning they exactly understood the role of training in ICT integration. Training instills confidence and competency while lack of it creates fear of breakdown on the equipment or even the unknown. This study concurs with Wanjala; Khaemba and Mukwa (2011) that effective technology implementation requires adequate

teacher training to confidently integrate ICT in professional operations. However, although Unluer, *et al* (2010) cited training opportunities as hindrance to ICT integration, on-the-job professional development was advocated for. Formal training was not the in thing per se but the alternative hands-on training applied too however interviews data revealed that principals were less trained in ICT although this had no influence on integration. Document analysis revealed that the DOS office had the most ICT savvy and trained personnel at various levels.

Internet connectivity is handy in communication and linkages both locally and globally however results indicated that there were mixed reactions on whether Internet connectivity influenced ICT integration in management. With a mean 3.94, Internet connectivity influenced principals' leadership for ICT integration especially with accessibility and functionality of the Internet, email and website. Despite the high positivity on Internet connectivity, data from interviews, observation and document analysis revealed that most schools had Internet connectivity issues ranging from non connection, poor connectivity, lack of power installation and outages alongside maintenance costs. This study resonated well with Oloo (2009) survey that 58.9% of school computers were not connected to Internet. Conversely, Internet services were easily accessed through cellphones (smartphones) or modems as options which was quasi corroborated by Makhanu and Kamper (2012) that although 84.0% of principals accessed Internet/email services, it was through wireless and Cellphones.

The complexity of technology requires technical support to manage troubleshooting issues especially in cases of less techno savvy staff. With a mean 4.50 citing technical support, there was an influence on principals' leadership for ICT integration in DOS office. Data from interviews and document analysis established that majority of schools hired certificate level ICT/computer holders due to financial constraints. The DOS staff would handle minor technical issues but complex ones attracted outsourcing services. This study concur with Musambai, *et al* (2017) that 61.9% of principals and 49.3% HODs agreed that technical support was a challenge. For this reason, principals in their leadership have a duty to consider providing qualified technical support.

School program implementation requires support of sorts for and from school management for success to be realized and with a mean of 4.20 respondents affirmed influence on principals' leadership. The integration of ICT is begged on administrative support for staff development, infrastructural provisions, access and technical support. Similarly school management requires support from stakeholders like MOE, BOM and sponsors financial, equipment and or personnel to integrate ICT. This finding was convergent with Katulo (2009) study that through the MOE schools received computers while NETSS were supported in computer maintenance. This kind of support was however never by chance but principals' demonstrated their leadership to seek for it. Data from document analysis revealed that principals sought support towards ICT through proposal writing or virement as a form of innovativeness.

Access to ICT equipment as a factor with a mean of 4.32 was rated as strongly influencing ICT integration. The findings revealed that while there were schools with adequate ICT devices and vice versa, accessibility turned out as a barrier to ICT integration. Data from interviews, document analysis and observation revealed that the DOS office was the most equipped office in ICT implying accessibility was not an issue as such. This finding concurs with Afshari *et al* (2010) that accessibility to computers in both developing and developed countries in efforts to ICT adoption was a problem. For instance, Muchiri, Ndirangu and Kanori (2014) study established that DPs (80%) and HODs (85%) were not able to access computers (80%), Internet (80%), Printers (60%, 72%) respectively. Accessibility to ICT equipment in the office of the DOS was determined by principals' leadership through team building.

Technology requires availability of power supply to run which this finding revealed that power supply as indicated in a mean of 3.17 had moderate influence on principals' leadership to integrate ICT in DOS office. From interviews and observation most schools had electricity however document analysis revealed power outages as an issue. This finding correlates with Makhanu and Kamper (2012) findings which revealed that most rural schools just like urban, installed electricity through Kenya Rural Electrification Project (KREP). The idea of electricity except in isolated cases should not be seen as a factor in isolation but as Laaria (2013) observed, irregular power supply occasioned by regular outages frustrate efforts to integrate ICT. This was corroborated by Kimuyu, Ndirangu and Okoth (2016) assertion that unreliable power supply as indicated by 16 (57.1%) was a challenge to ICT integration.

Majority of respondents contend that if there was enough time they would integrate ICT in management as indicated in a mean of 4.20. Laaria (2013) study corroborates that integrating ICT over burdened principals (65.56%) in multi-tasking management skills. Document analysis and interviews revealed that there was understaffing in most schools hence influencing principals' leadership.

Principals and other school subsystems' attitude towards ICT influence integration variously. The attitude of the users must be considered as they would ultimately determine integration. The Principals' attitude is seen in their commitment to ensure all essentials were in place for integration. Through interviews and document analysis data established that majority of the principals were positive about integration in DOS office. Nangue, Creunen and Church (2010) argued that phobia; resistance to change and sometimes age could lead to negative attitudes among principals towards ICT integration. Principals' positive attitude towards ICT integration is

motivated to integrate.

Teachers' age was cited by a majority revealed in a mean of 4.30 responding in the affirmative that influenced principals' leadership for ICT integration. Observations and document analysis established that majority of DOS (44.3%) were within an active age bracket of 35-39 years that would comfortably embrace ICT but the age of the principal too had a role. Age influences an individual's acceptance of change as Nangue, Creunen and Church (2011) observed most respondents did not associate with age as anticipated unlike this study where 12.3% did.

Room to integrate ICT referred to anywhere staff could easily access ICT equipment and use it. Most respondents stated that availability of room positively influenced integration of ICT, especially in schools with adequate ICTs and vice versa. Besides, the few that had, majority cited inadequacy and non functionality of computers while a minority argued that intricacies that came with shortage of rooms had no influence. Operating room was as an issue as from data gathered through interviews and document analysis which was confirmed through observation. This finding was inconsistent with Adomi and Kpangban (2010) study that high cost of ICT facilities and low budgetary allocation hindered application of ICT. This was interpreted to mean that room to integrate ICT in DOS had strong influence on principals' leadership as indicated by a mean 4.37.

Conclusion

This study sought to determine factors influencing principals' leadership for ICT integration in PSSM. Based on the findings, it was concluded that financial resource was crucial in the integration of ICT to facilitate TCO of the process. The administrative support which included government support for principals was imperative as teachers were encouraged to embrace the initiative.

Recommendation

It was recommended that the government through the MOE should increase their budgetary allocation to support schools financially on ICT integration and further mount in service courses on ICT integration and TCO for principals. The TSC should make it mandatory that each registered public secondary school has an ICT technician.

References

Adomi, E. E. & Kpangban, E. (2010). Application of ICTs in Nigerian Secondary Schools. In *Journal of Library Philosophy and Practice 2010*, ISSBN 1522- 0222.

Adu, E. O & Olatundun, S. A. (2013). The Use and Management of ICT in Schools Strategies for School Leaders. *In European Journal of Computer Science and Information Technology, Vol.1, No.2, PP.10-16*

Afshari, M. Abu Bakar, K. Wong, S. L. & Afshari, M. (2010). Principals Level of Computer Use and some Contributing Factors *in International Journal of Education and Information Technologies, issue 2, volume 4, 2010, PP. 121-128*

Cohen, L. M; & Marrison, K. (2000). Research Methods in Education. New York: Routledge Flamer Publishers.

Damkor, M., Irinyang, D. J & Haruna, M. (2015). The Role of ICT in Nigerian Educational System. *In International Journal of Research in Humanities and Social Studies, Volume 2, Issue 2, PP. 64-68,Sryhawa Publications*

Dionys, D. (2012).Introduction of ICT and Multimedia into Cambodia's Teacher Training Centres.In C. P. Lim & c. s. Chai (Eds), Building the ICT Capacity of the next Generation of Teachers inAsia. *In Australasian Journal of Educational Technology,28 (special issue, 6), 1068-1073.* Acessed from: http://www.ascilite.org.au/ajet/ajet28.dionys.html

Export Processing Zones. (2005). *Kenya's ICT Industry*. Retrieved from http://CDTunisi/ict_compendium/paesi/kenya/KENYA02.pdf

Ghavifekr, S, Afshari, M, Siraji, S & Seger, K.(2013). ICT Application for Administration and Management:A Conceptual Review.A paper Presented at the 13th International Educational Technology Conference *In procedia- Social and Behavioral Sciences PP.1344-1352*

Gronow, M. (2007). ICT Leadership in School Education. A Paper presented at Australian Catholic University Conference " Directions for Catholic Education Leadership in the 21st century" between 29th July-1st Aug. at The Sofitel Wentworth Sidney, Australia

Hasan, H. (1998). Activity Theory: A Basis for the Contextual Study on Information Systems in Organizations. In Hasan, E. Gould & P. N. Hyland (Eds.), Information Systems and Activity Theory Tools in Context, PP.19-38. Wollongong: University of Wollongong Press

Hill, R. (1998). What Sample Size is "Enough" in Internet Survey Research? Interpersonal Computing and Technology; *An Electronic Journal for the 21st century, 6(3-4).*

Isaac, S. (2007). Survey of ICT Education in Africa: South Africa Country Report. Available on: www.infodev.org

Isaac, S., & Michael, W. B. (1995). Handbook in Research and Evaluation, San Diego , Ca: Educational and Industrial Testing Services

Katulo, M. M. (2009). An Investigation of the Role of Principals in Promoting Compute Usage in Selected Namibian Schools. Published M.ED Thesis, Namibia.

Khan, S. H.; Hasan, M. & Clement, C. K. (2012). Barriers to the Introduction of ICT into Education in Developing Countries: The Example of Bangladesh. *In International Journal of Instruction, Vol.5, No. 2, PP. 61-80.* Accessed from: www.e-iji.net

Kimuyu, D. N., Kalai, J. M. & Okoth, U. (2016). Factors Influencing Principals' Integration of ICT in Administration of Public Secondary Schools in Kitui Central Sub County, Kenya. Unpublished M.ED Research Project, University of Nairobi: Nairobi

Kipsoi, E. J., Chang'ach, J. K &. Sang, H. C. (2012). Challenges Facing Adoption of ICT in Educational Management in Schools in Kenya. *In Journal of Sociological Research, Vol.3, No.1, PP.18-28*

Kiptalam, G. K & Rodríguez, A. J. (2010). Internet Utilization: A Case of Connected Rural and Urban Secondary Schools in Kenya in *International Journal of Computing and ICT Research. Vol.4, No.1, PP.49-63.*Accesed from:www.ijcir.org/volume4Number1/article6.pdf

Kula, A. (2010). Barriers for ICT Integration, Strategies Developed against Them and Cases in Turkey. Retrieved from: http://meb.academia.edu/

Kyalo, J. K. & Nzuki, D. M. (2014). Determinants of ICT Integration in Tertiary Institutions. In *International Journal of Education and Research, Vol. 2 No. 3*.Accessed From www.Ijern.Com

Laaria, M. (2013) Leadership Challenges in Implementation of ICT in Public Secondary Schools, Kenya, *Journal of Education and Learning* 2 (1) 32-43 http://dx.doi.org/10.5539/jel.v2n1p3.

Makewa, L., Maremo, J., Role, E. & Role, J. (2013). ICT in Secondary School Administration in Rural Southern Kenya: An Educator's Eye on its Importance and Use in *International Journal of Education and Development in using ICT, Vol. 9, Issue 2, PP. 48-63*

Makhanu, S. E. & Kamper, G. D. (2010). Principals' Literacy in ICT: Towards Improving Secondary School Performance in Kenya. Published Doctor of Education Thesis, University of South Africa

Makhanu, S. E. & Kamper, G. D. (2012). The Relationship between Principals' Access to ICT and School Performance in Kenya in *Journal of Education and General Studies Vol. 1 (1), PP. 038-47.*

Manduku, J. Kosgey, A. & Sang, H. (2012). Adoption and Use of ICT in Enhancing Management of Public Secondary Schools: A Survey of Kesses Zone Secondary Schools in Wareng District of Uasin Gishu County, Kenya.

Medeiros, A.C.B., Crilly, N., & Clarkson, P. J. (2012). Influence of Aging on the Experience of ICT. Department of Engineering, University of Cambodia.

Menjo, K. K & Boit, J. M. (2005). The Challenges of Using ICT in School Administration in Kenya. Available on: www.ijcir.org/volume4number1/article6.pdf

Merireng, S. & Koringura, J. (2013). Effect of Computers in Management of Secondary Schools in Kenya: A Case of West Pokot County. Unpublished Master of Project Planning and Management Research Project. University of Nairobi: Nairobi.

The Millennium Development Goals Report (2010). United Nations: New York Ministry of Education Science & Technology. (2005). Sessional Paper No. 1 of 2005 on Policy Framework for Education,Training, and Research, Nairobi: Government Printer.

Ministry of Education.(2006). Kenya National ICT Strategy for Education and Training. Nairobi: MOE.

Muchiri, G. M., Ndirangu,C. & Kanori, E.(2014). Factors Influencing School Principals' Integration of ICT in Administration of Public Secondary Schools in Githunguri Sub County, Kiambu County, Kenya. Published M.Ed Project. Kenyatta University: Nairobi, Kenya

Mue, S. J., Itegi, F, & Kyalo, D.(2014). Application of ICT in School Administration in Public Secondary Schools in Lang'ata Division, Nairobi County, Kenya. Unpublished M.Ed Project. Kenyatta University: Nairobi, Kenya

Muriko, G. L., Njuguna, F. W. & Njihia, M, (2016).Factors Affecting Utilization of ICT in Administration of Public Secondary Schools in Kiambu Sub County, Kiambu County, Kenya. Unpublished M.ED Research Project. Kenyatta University: Nairobi, Kenya

Musambai, E. A., Ndirangu, M., & Mukhwana, F. (2017). Influence of ICT on the Quality of Educational Management in Secondary Schools in Kakamega County, Kenya. *In the International Journal of Science And Technology, Vol. 5,Issue 6, PP. 90-97*

Nangue, C. R., Van Greunen, D., & Church, K. (2010). Factors that Impact on Successful Integration of ICT in Schools in Cameroon. Nelson Mandela Metropolitan University: South Africa.

Nangue, C. R., Van Greunen, D., & Church, K. (2011). Guidelines for Successful Integration of ICT in Schools in Cameroon. M.Tech in IT. Nelson Mandela Metropolitan University: South Africa

Ndungu, M. K. & Nzuki, M. D. (2013). Determinants of ICT Usage in Secondary Schools in Gatundu District,

Kiambu County, Kenya. Unpublished MBA Project, Kenyatta University: Nairobi, Kenya.

Nyanchoka, M. O., Matula, P, D. & Kalai, J.M. (2017). Factors Influencing Principapal ICT Integration in Administration of Public Secondary Schools in Isinya Sub County, Kenya. Unpublished Research Project: University of Nairobi: Nairobi

Oguta, J.O., Egessa, R. K. W., & Musiega, D. (2014). Effects of ICT Application on Strategic Educational Quality Standards Management in Bungoma County,Kenya. *International Journal of Business and Management Invention, 3*(5), 11-17.

Oloo, L. M. (2009). Baseline Survey Report for ICT in Selected Secondary Schools in Parts of Kenya Draft Report. Available on: www.gg.rhul.ac.uk/ict4d/Kenyaschools.pdf.

Oluoch, D. A, Ajowi, J. O. & Bosire, J. (2015). Factors Limiting the Usage of ICT in the Delivery of Management Services in Public Secondary Schools in Siaya County.In *Mediterranean Journal of social sciences, MCSER Publishing, Rome –Italy,Vol. 6, No. 2.*

Orodho, J. A. (2004). Techniques of Writing Research Proposals and Reports in Education and Social Sciences. Nairobi: Masola Publishers.

Papaoiannou, P. & Charalambus, K. (2011). Principals' Attitudes towards ICT and their Perceptions about Factors that Facilitate or Inhibit ICT Integration in Primary Schools of Cyprus in *Journal of Information Technology Education, Vol. (10) 2011, PP. 349-369*

Saunders, M, Lewis, P. & Thornhill, A. (2012). " Research Methods for Business Students" (6th Ed.).Pearson Educational Limited

Seyal, A. H. (2012). A Preliminary Study of School Administrators' Use of ICTs: Bruneian Perspective in *International Journal of Education and Development Using ICT, 2012, Vol. 8, Issue 1, Pp. 29-45.*

Swarts, P. & Wachira, E. M. (2010). Tanzania: ICT in Education Situational Analysis. Available on: www.unescobkk.org/education/ict/themes

Tagalou, A., Massourou, V., Kuriakopoulou, K. & Efthimiopoulos, A. (2013). ICT in Educational Management. Accessed: https://www.researchgate.net/publication/282606958

Treece, E. W., & Treece, J. W.(1982). Elements of Reseach in Nursing (3rd ed.). St Louis, MO: Mosby

Tubin, D. & Klein, S. (2007). Designing a School Website: Contents, Structure and Responsiveness. *In Planning and Changing Journal,vol.38, No. 3&4, PP.191-207*

UNESCO, (2011). Transforming Education: The Power of ICT Policies.Paris: France

Wanjala, M. M. S., Khaemba, E. N & Mukwa, C. (2011). Significant Factors in Professional Staff Development for the Implementation of ICT Education in Secondary Schools: A Case of Schools in Bungoma District, Kenya. *In International Journal of Curriculum and Instruction Vol. 1(1), pp. 30- 42.*

Zohrabi, M. (2013).Mixed Research Methods: Instruments, Validity, Reliability and Reporting Findings. *In Theory and Practice in Language Studies, Vol.3, No.2, PP. 254-262.*