The influence of Principals' Related Factors on ICT Integration in the Management of Public Secondary Schools in Kitui County, Kenya

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Abstract
The study sought to determine the influence of principals' related factors on integration of Information Communication Technology in the management of public secondary schools in Kitui County, Kenya. A descriptive survey research design was used in this study. The study was carried out in 58 public secondary schools in Kitui County that have functional ICT infrastructure. This study used sample size table as proposed by Krejcie and Morgan (1970) whereby 58 principals, 58 senior teachers and 266 assistant teachers from schools that have functional ICT infrastructure were selected. All 16 Sub-county Directors of Education and one County Director of Education were selected for the study. The researcher used questionnaires to collect data from principals, senior teachers and assistant teachers while interview schedule was used to collect data from Sub-county Directors of Education in Kitui County. The collected data was analyzed using both quantitative and qualitative data analysis approaches whereby both descriptive and inferential statistics were used. Descriptive statistics that were used in this study include percentages and mean. Hypotheses were tested using Pearson's moment of correlation coefficient and Chi-square tests for independence. The qualitative data were presented in the form of narrative and integrated within the quantitative data. The findings of the study were; 78% of the principals integrate ICT in school management less frequently; there was a strong negative correlation r (50) = -0.750, p<0.05 between principals age and ICT integration, a strong positive correlation r (50) = 0.559, p< 0.05 between professional experience and ICT integration. It was also established that there was a significant association between principals' gender and ICT integration and also a significant association between the level of education and ICT integration. The study recommended that; the government should introduce compulsory computer training for all principals and teachers. This would equip all the principals with ICT skills, the Universities should also make it compulsory for all students being trained as teachers to do a unit on computer.

Keywords: Information Communication Technology, Public secondary schools, Principal related factors

Introduction
The study of information technology implementation in organizations and institutions began around 1950s (Clark & Meyor, 2003). These researchers argue that the potential of Information Communications Technology (ICT) to enhance human capabilities and revolutionize the management of organizations was first realized in other sectors of society,

mostly in the business world, engineering and the military, other than in education. The rapid evolution of technology has necessitated a change of approach to corporate technology management. The components of Information Communication Technology include print media, electronic media, telephone, telex, e-mail, fax and computers (Ayeni, 2004).

The importance of ICT in the educational management is quite evident worldwide and especially in Europe and United States of America (Empirica, 2006). Information Communication Technology was first used in educational institutions in North America and Europe in 1970s. In these Countries, computers are used to enable successful learning in e-learning and to provide professional development for multiple staff in a learning institution and school management systems (SMS), enabling them to be more effective. Brannigan (2010) argues that in recent times, there has been a global explosion in the use of computers in schools as an instructional, communicative and informational resource tools by use of databases, spreadsheets, multimedia, email, and network search engines.

Due to these rapid changes, managers and other educators globally are compelled to carefully analyze the academic and social needs of their students in line with technology. Principals therefore have no option but to embrace the use and integration of ICT in their schools. ICT is rich and has new knowledge likely to keep school managers versed with technological techniques in problem solving and as part of injecting the best management practices. According to Okumbe (2001) the principal is charged with the task of managing curriculum and instruction, staff personnel, student personnel, school plant, finances and school community relations. Thus the principals are charged with the responsibility of carefully planning and utilizing the available resources in the school to achieve the institutional goals.

Principal's Level of Education and Training in ICT Skills
The school principal is the key to the adoption of educational reform. The principals' knowledge, skill, and philosophy determine their ICT adaptation methods. Effective implementation of educational technology requires adequate training to enable teachers confidently use and integrate ICT in professional operations (Wanjala, Khaemba & Mukwa, 2011). They further report that success of integrating ICT into school management in developed and developing countries like Kenya depend on how principals and teachers have been prepared to use computers. When properly trained, principals' ability to select, integrate and evaluate computer tools to support school management will improve.

A study by Albirini (2006) observes that pre-service principal education can play a significant role in providing opportunities for experimentation with ICT before using it in the school administration. Lack of ICT focus in initial teacher training/education is a barrier to teachers' use of ICT. Where there is no effective training on ICT and educational technology, teachers will not be able to use ICT resources for integration in management. The researcher asserts that the success of ICT integration in management activities depend on the support given by the school principal. This is due to the fact that principals who have positive mind-set and perceptions to ICT will endeavor to support the use of technology in their planning process, despite the challenges. Ogachi (2015) in a study on factors influencing principals' integration of information communication technology in administration of public secondary schools in Isinya sub-county, Kenya established that most of principals were holders of Masters of Education, while most of deputy principals were holders of Bachelors of Education. However, senior teachers mostly held Bachelors of Education and Post-Graduate Diploma in Education. The implication of these findings is that the respondents had sufficient

knowledge on the importance of ICT, especially the head teachers who were the main focus of this study. Information is power and as a principal furthers his or her education, the better his or her understanding becomes in regard to the use of ICT in administrative task areas. The study further established that the ICT literacy among the principals influenced the integration of ICT in administrative task areas. This is manifested by the fact that principals who had integrated ICT in their administrative task areas were found to have participated in ICT training program. However, it was apparent that the ICT literacy among principals was mainly in financial management and least in school community relations. This meant that principals accorded greater importance to the financial aspects of administering schools as compared to the other administrative tasks.

Mbatia (2014) reveal that majority of the secondary school principals in Githunguri Sub-county, Kiambu County, Kenya have little computer literacy in Microsoft word (60 percent), PowerPoint (60 percent) and email and internet at 60 percent and Microsoft excel at 70 percent and therefore cannot effectively implement ICT integration in school administration. Non formal interviews with these principals revealed that they depended on the school secretaries to access the internet for them. Menjo and Boit (2005) observed that ICT, as a management tool in secondary schools was not used effectively to address management issues. They further observe that 53.9% of managers attended introductory courses on computers, 33.3% on application programs and 17.5% on programs for teaching while only 21.8% attended courses for performing management tasks. Although 31% of teachers underwent either formal training or school workshops, 60% could not use computers for management activities due to inadequate training.

Principal's Gender and ICT Integration in School Management
Razak and Zohara, (2012) carried out a study which establishes how the use of computers to facilitate school management processes has been neglected. This study involved 66 managers from 11 secondary schools in the Romp in District, Pahang, aimed at determining the level of computer usage and school administrators' attitudes toward using computers for school management. It also investigated the existence of differences in the level of computer usage among school managers based on demographic factors such as position, gender and age. Although the findings indicate a high level of computer usage for management process in schools, and positive attitudes toward using computers, there is no significant difference in computer usage levels based on gender and age. Gender differences and the use of ICT have however been reported in several studies. Wozney,Venkatesh and Abrami (2006) reveal that male teachers use more ICT in their teaching and learning processes than their female counterparts. Similarly, Markauskaite (2006) notes significant differences between males and females in technical ICT capabilities, and situational and longitudinal sustainability. Males on average worked with computers significantly for more hours per week than females. Gender also remained a significant predictor of some trainee teachers scores, related to their technical ICT capabilities.

A study by Chepkonga (2015) sought to find out whether there exists a relationship between the principals gender and ICT integration in management of public secondary schools in Nairobi County, Kenya. The findings of the study reveal that there was no significant relationship between the principals' gender and ICT integration in management of public secondary schools in Kenya. According to Papaioannou and Kyriacos (2011) Cyprus primary school principals, generally, hold positive attitudes towards ICT. However, considerably statistically significant differences were observed across gender. Cyprus male principals hold

more positive attitudes towards ICT, without this meaning that female principals have negative attitudes. Statistically significant differences were found in three subscales. More precisely, male principals are more enthusiastic about computers (t (127) = 2.13, $p<0.05$), have less computer anxiety (t (126) = 2.23, $p<0.05$), and believe to a lesser degree that computers have a negative impact on society (t (127) = 2.25, $p<0.05$).

Principal's Professional Experience and ICT Integration in Management of Schools
People's experience with the use of technology has been defined as the amount and type of computer skills a person acquires over time. According to Gorder (2008) teacher experience is significantly correlated to the actual use of technology hence effective use of computer is related to technological comfort levels and the liberty to shape instruction to teacher perceived student needs. National Centre for Education Statistics (2000) reports that teachers with less experience in teaching are more likely to integrate computers in their teaching than teachers with more experience in teaching. According to the report, teachers with up to three years teaching experience report spending 48% of their time utilizing computers, teachers with teaching experience between 4 and 9 years, spend 45% of their time utilizing computers, teachers with experience between 10 and 19 years spend 47% of the time, and finally teachers with more than 20 years teaching experience utilize computers 33% of their time. The reason to this disparity may be that fresh teachers are more experienced in using the technology. Granger, Morbey, Lotherington, Owston and Wideman (2002) report that there is a null relationship between teachers' teaching experience and experience in the use of ICT implying that teachers' ICT skills and successful implementation is complex and not a clear predictor of ICT integration.

Principal's Age and ICT Integration in Management of Schools
Age affects teachers' perceptions of ICT and its usage on management. The younger, less experienced teachers use computers in broad micro transformation fashion and they are more likely to be ICT proficient. They have focus on educational courses on ICT and will be less constrained by prior attitudes or habit than their older more experienced colleagues (Haddad & Jurich 2005). Gode (2013) investigated the factors influencing integration of information and communication technologies in public primary teacher training colleges in central region of Kenya. The results of the study indicate that out of 140 respondents, in the category of 23 teacher trainers who were aged between 31 and 40 years, 16(69.56%) had adopted ICT in teaching while 7(30.44%) had not adopted ICT. In the category of 84 teacher trainers who were aged between 41 and 50 years, 35(41.67%) had adopted ICT while 49(58.33%) had not adopted ICT. Lastly, in the category of 33 teacher trainers who were over 50 years of age, 1(3.13%) had adopted ICT while the other 32(96.97%) had not adopted ICT. The findings show that teachers of the ages 40 years and below had formed large proportion of teacher trainers who adopted ICT. The study therefore recommends that primary teacher training colleges should develop strategies to identify strengths and weakness of various technological resources as well as an evaluation framework. Teacher trainers should also be provided with regular trainings and seminars on how to integrate ICT in teaching and learning process and adopt policies that enhance integration of ICT in the teaching and learning process.

According to Edward (2015) age affects teachers' perceptions of ICT and its usage on management. Young principals have been seen to integrate ICT more compared to elderly principals a factor which has been attributed to the fact that they went through an education system that had integrated ICT. The study recommends that the Ministry of Education should construct computer laboratories and equip them with ICT tools to facilitate training of

teachers and administrators in all areas of management. Mogeni (2013) observes that principal's age affected integration of ICT in schools where principals aged between 30 and 49 years showed higher percentage of ICT integration than those aged between 50 and 60 years who are heading to retire. Teachers should change attitude towards the use and integration of ICT in the schools so as to create information technology in all aspects of teaching and learning institutions.

Purpose of the Study
The purpose of this study was to investigate the influence of Principals' related factors on ICT integration in the management of public secondary schools in Kitui County, Kenya. Specifically the study is to: Establish the influence of principals age on ICT integration in the management of public secondary schools, to determine the influence of principals gender on ICT integration in the management of public secondary schools, to examine the influence of principals professional experience on ICT integration in the management of public secondary schools and to establish the influence of principals level of education on the integration of ICT in the management of public secondary schools in Kitui County, Kenya.

Methodology
This study adopted descriptive survey research design. This design is useful in describing the characteristics of a large population, makes use of large samples, thus making the results statistically significant even when analyzing multiple variables, many questions can be asked about a given topic giving considerable flexibility to the analysis. This study targeted only schools which have functional ICTs. According to reports at the Kitui County Education Office, only 58 public secondary schools in the County had functional ICT infrastructure (Kitui County Education office, August, 2015). The target population for this study was therefore the 58 public secondary schools principals, 58 senior teachers, and 870 assistant teachers, 16 Sub-county Directors of Education in the 16 Sub-counties and one County Director of Education in Kitui County.This study used sample size table as proposed by Krejcie and Morgan (1970). The study sampled 58 principals, 58 senior teachers and 266 assistant teachers from 58 public secondary Schools in Kitui County that have functioning ICT infrastructure. All the 16 Sub-county Directors of Education and the County Director of Education were sampled for the study. This made a sample size of 58 principals, 58 senior teachers, and 266 assistant teachers, 16 Sub-county Directors of Education and one County Director of Education. The study used questionnaires and the interview schedule as tools for data collection. The questionnaires were administered to principals and teachers while interview schedules were administered to the Sub-county Directors of Education and the County Director of Education.

Findings of the Study
In order to establish the influence of principals' characteristics on ICT integration in management of public secondary schools in Kitui County, questionnaires were administered to 58 principals 58 senior teachers and 266 assistant teachers. The interview guide was used to collect data from 16 Sub-county Directors of Education and one County Director of Education. The data was then analyzed on the basis of these questionnaires and interview guides.

Principals' characteristics and ICT Integration in Management of Public Secondary Schools

Table 1 tabulates the responses of senior teachers and assistant teachers on principal related factor with greatest influence on ICT integration. It shows how each of the principal related factor influence ICT integration in management of public secondary schools.

Table 1. Senior Teachers and Teachers Responses on principal Related Factors with Influence on ICT Integration

Factors	Senior Teachers		Teachers	
	Frequency	%	Frequency	%
Age	25	50.0	100	40.0
Gender	15	30.0	80	32.0
Level of Education	6	12.0	50	20.0
Professional experience	4	8.0	20	8.0
Total	**50**	**100.0**	**250**	**100**

Principals' age and ICT integration in management of public secondary schools
The demographic information indicated that majority (64%) of principals are aged between 41 and 50 years while majority (50%) of senior teachers were aged between 30 and 40 years. It was also observed that 40% of teachers were aged between 30 and 40 years, majority of the teachers (32%) and 10% of senior teachers were below 30 years of age while no principal was aged below 30 years. The study established that the principal's age influences ICT integration in management of public secondary schools to a very great extent. This was evidenced by the responses of majority (76%) of the respondents. Majority (50% and 40%) of the senior teachers and assistant teachers respectively indicated that the principals' age had the greatest influence on ICT integration in management of schools.

The researcher tested hypotheses below using Pearson correlation test.

H_0: There is no statistically significant relationship between principals' age and ICT integration in the management of public secondary schools in Kitui County, Kenya.

H_0: There is no statistically significant relationship principals' professional experience and ICT integration in the management of public secondary schools in Kitui County, Kenya.

The correlation results were presented in Table 2 below.

Table 2: Correlation for Principal's age and Professional Experience and ICT Integration in Management of Schools.

		Principals age	Professional experience	ICT integration
Principals age	Pearson Correlation	1		-.750[**]
	Sig. (2-tailed)			.000
	N			350
Professional experience	Pearson Correlation		1	.559[**]
	Sig. (2-tailed)			.012
	N			350
ICT integration	Pearson Correlation			1
	Sig. (2-tailed)			
	N			

**. Correlation is significant at the 0.05 level (2-tailed).

Table 3 shows that there is a strong negative relationship r (50) = -0.750, p<0.05 between principal's age and ICT integration. This means that the younger a principal is the more they are likely to integrate ICT in management and vice versa.

Principal's gender and ICT integration in management of public secondary schools
The demographic findings of the study indicate that majority of the respondents (60% and 56%) of the principals and senior teachers respectively were male. It is also observed that 68% of the teachers were male. The researcher further used chi-square to test the hypothesis that; there is no statistically significant association between principals' gender and ICT integration in the management of public secondary schools in Kitui County, Kenya. The results were presented in Table 3.

Table 3: Chi-square tests for association between gender and ICT integration in Management of schools

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	57.973[a]	4	.000
Likelihood Ratio	10.052	4	.001
Linear-by-Linear Association	17.443	1	.000
N of Valid Cases	50		

a. 8 cells (80.0%) have expected count less than 5. The minimum expected count is .05 at 0.05 sig. level.

The study established that gender influences ICT integration in management of schools. This was evidenced by the fact that 32% of the assistant teachers and 30% of the senior teachers respectively reported that most female principals were not using ICT as their male counterparts in school management. Chi-square test for independence shows that there is a significant association χ^2 (1, 4) = 57.973, p< 0.05) between gender and ICT integration. This is as it is indicated in table 3 above, the linear association is very high (17.443). Reports from interview schedule for the County Director and Sub-county Directors of Education indicate that, the male principals used internet more often than their female counterpart.

Principals' professional experience and ICT integration in management of public secondary schools

The experience of teachers is a pointer to quality leadership and management including student's behavior. This experience is usually determined by the number of years worked. The respondents were requested to indicate their experience. The results are presented in Table 4 below.

Table 4: Professional Experience of Respondents

	Principals		Senior teachers		Teachers	
Experience	Frequency	%	Frequency	%	Frequency	%
Less than 5 years	0	0.0	0	0.0	70	28.0
5 -9	2	4.0	19	38.0	90	36.0
10 – 15	21	42.0	25	50.0	50	20.0
More than 15	27	54.0	6	12.0	40	16.0
Total	**50**	**100.0**	**50**	**100.0**	**250**	**100**

Table 4 shows that majority of the Principals (54%) had a working experience of more than 15 years while most (50%) of senior teachers had an experience of 10 to 15 years. It was also established that majority (36%) of assistant teachers had worked for five to nine years. The study established that principal's professional experience influence ICT integration in management of public secondary schools. Results from Pearson Correlations test as indicated in table 2 above shows that there is a strong positive relationship r (50) = 0.559, p< 0.05 between principals professional experience and ICT integration. This means that the more professionally experienced a principal is the more they will integrate ICT in management.

Principals level of education and ICT integration in management of public secondary schools
The demographic results of the study indicate that majority of the principals (58%), senior teachers (64%) and assistant teachers 80% had Bachelor of Education Degree as their highest qualification. This was followed by those with master's degree of whom 36% were principals, 24% were senior teachers and 4% were assistant teachers. A Pearson chi-square was used to test the hypothesis; there is no statistically significant association between

principals' level of education and ICT integration in the management of public secondary schools in Kitui County, Kenya.

The results were presented in Table 5 below:

Table 5: Chi-square tests for association between level of Education and ICT integration

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	65.423[a]	4	.000
Likelihood Ratio	9.642	4	.000
Linear-by-Linear Association	19.111	1	.000
N of Valid Cases	50		

a. 8 cells (75.0%) have expected count less than 5. The minimum expected count is .05. 0.05 sig. level.

The results established that principal's level of education influence ICT integration in management of public secondary schools. Table 5 shows that there is a significant association (χ^2 (1, 4) = 65.423, p< 0.05) between level of education and ICT integration. The report from interview schedule for the Sub-County directors of Education also shows that principal's characteristics influence the ICT integration in secondary schools. The report indicates that principals who hold master's degree were more willing to use ICT as opposed to those with lower levels of education. This is attributed to the fact that they obtained exposure to ICT during their course work hence they have ICT skills.

Conclusion
The study established that principal's age influence ICT integration in management of public secondary schools in that younger principals integrate ICT in management better and vice versa. It was also observed that principal's gender influence ICT integration in management of schools, male principals were found to integrate ICT in management better than their female counter parts. The study also established that principal's professional experience influence ICT integration in management of public secondary schools. Finally the study observed that principal's level of education influence ICT integration in management of public secondary schools to a very great extent. Principals with higher levels of education integrated ICT better than those with low levels of education.

Recommendations
Based on the study finding, the following recommendations are made:
1) Firstly, the government should introduce compulsory computer training for all principals and teachers. This would equip all the principals with ICT skills. The universities should also make it compulsory for all students training as teachers to take a compulsory unit on computer studies. The academic professional training that teachers and principals undergo should be assessed if it is relevantly meeting the threshold to promote the use and integration of ICT in public secondary schools.

2) The government should also increase its supply of computers to schools and make it compulsory for all schools to integrate ICT in the management tasks as well as build computer laboratories to all the schools. This will enable most schools to acquire

computers which can be used for ICT integration in management of the schools. The Ministry of Education should formulate a policy requiring every public secondary school teacher to procure and own a laptop through a government incentive such as subsidy, tax waiver or creation of an affordable laptop loan scheme.

3) All the schools should have internet connectivity to enable principals and teachers to use ICT in the schools. This would help in communication as well as academic research. The schools should also have alternative source of power in places where there is no electricity so as to enable effective ICT integration in school management. The Teachers Service Commission should peg future recruitment and promotions of teachers to those who have undergone ICT training for e-learning and ability to integrate ICT into their duties of management.

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