The mediating role of School Environment on the Relationship between Transformational Leadership Style and ICT Integration in Teaching and Learning

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ABSTRACT
In spite of the trainings mounted by the government and other stakeholders in Education to capacity build the teachers in using technology the uptake has been low. Previous studies report that the integration of Information, Communication and Technology (ICT) into the curriculum remains problematic in the school context. Some of the problems encountered in the process of integrating ICT into the curriculum are both school leadership and school environment. It is against this backdrop that the present study set out to examine the mediating influence of school environment on the relationship between transformational leadership style and ICT integration in teaching and learning in public primary schools. The target population for this study comprised of 6150 teachers drawn from public primary schools in Nairobi County. The study was conducted in a sample of the public primary schools in the eleven sub-counties of Nairobi County namely; Embakasi, Makadara, Kamukunji, Starehe, Njiru, Kasarani, Westlands, Langata, Kibra, Mathare and Dagoretti. Simple random sampling from the target was employed in the study. Teachers responded to a structured questionnaire while the head teachers had an in-depth interview. An observation checklist was also used to assess resources used by the teachers for ICT integration. Both descriptive and inferential analysis were employed. Findings indicate that school environment has a significant mediating effect on the relationship between transformation leadership style and ICT integration ($\beta_2 = 0.232$, $t = 3.726$, p-value < 0.001). The study recommends that.

Key Words: Teacher Self-Efficacy, Transformational Leadership Style, ICT Integration in Teaching and Learning

1. Introduction

The effective use of the wide range of facilities offered by ICT opens up unprecedented opportunities for invigorating learning and teaching in our schools and improving pupils' attainment in coursework across the whole curriculum. Indeed, the thinking on the nature of the curriculum itself is likely to be challenged as the use of ICT becomes more effective and widespread. The reformed curriculum that Kenya is experiencing at the moment is edged on the nurturing every child's potential. Central to the competencies that it addresses is the digital literacy that is entrenched in every learning area (Basic Curriculum Framework, 2016). Besides, the government's initiative of deploying digital devices to all standard one pupils in Primary schools in Kenya is another indicator of how fast ICT is invigorating teaching and learning process in Kenya.

Leadership is one of several critical components in the successful ICT integrations in education (Littrell et al., 2015). Many studies have shown that school leadership plays an increasingly important role in leading change, providing vision and objectives, as well as professional development initiatives in using ICT to bring about pedagogical changes; Schiller (2015). Teo (2009) state that the quality of school leadership can be assessed by the ability of the head teacher to create a school environment that fosters staff and pupil productivity and creativity. School leadership plays a key role in improving school's outcomes by influencing the motivation and capacities of teachers as well as the school environment and environment (Bush, 2015). The head teacher must employ inclusive kind of leadership where they will involve other people as a team. This team gets a deliberate opportunity to contribute to the vision, culture and climate of the school and thus the head teacher has a duty to create the opportunities to make this happen and teachers partly determine the leadership styles of the head teacher (Mutula, 2016). As a leader, the head teacher has the power to influence job satisfaction among the teachers under them. Leadership styles or traits are the characteristic way in which a leader uses power, makes decision, and interacts with others.

Many studies have shown that school leadership plays an increasingly important role in leading change, providing vision and objectives, as well as professional development initiatives in using ICT to bring about pedagogical changes; Schiller (2002). Wilmore and Thomas (2001:115-116) state that the quality of school leadership can be assessed by the ability of the head teacher to create a school environment that fosters staff and pupil productivity and creativity. They add that transformational leaders are value driven and committed to the creation of effective learning environments. As such, school environment is also a critical medium for ICT integration in teaching and learning (Moyle, 2006).

Defined by Lindelow (2015) as the feelings as individual got from experiences within a school system, school environment should develop in each individual the knowledge, interest, ideals, attitudes, habits, skills and powers, whereby s/he will find his/her right place in the social order and use that position to shape him/her and the society both towards the higher and nobler ends (Wehlage, Rutter, Smith, Lesko & Fernandez, 2016). Neil (1987) defined school environment as a combination of eight variables: clear school mission, safe and well-ordered learning environment, expectation for success, classroom interaction, high morale, effective instructional leadership, monitoring of learner progress and positive home school relationship. The school administration should work towards the improvement of school environment, so that a better output from school could be expected (Sweeney, 2016).

Kenya has realized the importance of embracing technology in learning and has made tremendous steps towards integrating it in education. The government of Kenya is devoted to the utilization of ICT which includes digital information technologies, and other resources to enhance access to learning for all Kenyans as indicated in its strategic plan (GOK, 2016). The government has developed a National policy that led to the development of National ICT strategy for education and training (2016). This strategy outlines the implementation of use of ICT in teaching and learning process. It further reinforces the government desire to use ICT to facilitate education.

Consequently, there has been continuous deployment of ICT infrastructure to schools and learning institutions. Some of the initiatives along this line include the NEPAD e-schools (2015); the e-schools initiative; the Multi-media lab project (TELEVIC); the ESP-ICT Computer for schools project (2010 -2012); the Accelerating 21st Century Education (ACE) project (2010-2012); Tafakari Project in TTCs; the Badiliko Project (British Council) and the Holistic Model project (2011-2012). The most recent of these initiatives is the Digital Literacy program (DLP) where learning devices have been deployed in all the primary schools in Kenya for the standard one pupils. This deployment is coordinated by ICT authority and is one of the flagship projects of the Government of Kenya.

Further, to provide coordination and harmonization of initiatives in education, the State Department of Education established ICT4E unit and Team. This has provided continued guidance on public-private partnerships to mobilize resources for ICT in education. Besides, the government through Kenya Institute of Curriculum development has developed digital content for Primary and Secondary Schools for use by the learners in the ICT integration in Education. Accordingly, there is a wide range of ICT initiatives and projects ongoing in Kenya focused on e-infrastructure with the aim of boosting the adoption of ICT in public primary schools not only in Nairobi County, but across the country. Key among these include the Digital Learning Programme (DLP) initiated by the Government of Kenya in 2013. The programme targets learners in all public primary schools and is aimed at integrating the use of digital technologies in learning. Under the programme, 75,000 public primary school teachers have been trained as at October 2018 in readiness for the project implementation (GoK, 2019).

However, given the milestones achieved so far in ICT integration in education in Kenya, and also the efforts put in place to ensure that technology is in use in the Kenyan schools, teachers have been slow in adopting use of ICTs in teaching and learning indicated by low uptake levels (MOE, 2012). The British Educational Communications and Technology Agency (2014) reported that only few teachers succeed in integrating ICT into subject teaching in a fruitful and constructive way that can promote learners' conceptual understandings and can stimulate higher-level thinking and reasoning. The report further states that in most of the cases, teachers just use technology to do what they have always done, although in fact they often claim to have changed their teaching practice. Further, a number of teachers report that they do not feel comfortable with the ICT integration in subject teaching, since their role was predetermined and designed by educational authorities and teachers feel that they face a lack of professional autonomy (Olson, 2010). Although the government has provided a national roadmap ICT policy, financial plan for ICT use in schools that requires its relevant extraction and implementation by key school leaders including the deployment of digital devices in all the Primary schools in Kenya through DLP. Despite these road maps developed by the government to implement ICT-based curriculum and instruction in schools, the situation in many schools in Kenya is that many of these schools are not effectively implementing ICT in curriculum and management as intended.

Previous studies (Keiyoro, 2011; Manduku et al., 2012; Ling, 2013) report that the ICT integration into the curriculum remains problematic in the school context. Some of the problems encountered in the process of integrating ICT into the curriculum include leaders' perceptions of ICT, teacher competency, availability of a School mission,good infrastructure, accessibility of instructional materials, good class interaction between the teachers and the learners, good support from the head teacher and good interaction between parents and teachers in monitoring the learners 'progress (Keiyoro, 2011; Manduku et al., 2012; Gikonyo, 2012; Mutula, 2016). It is against this backdrop that the present study sought to examine the mediating influence of school environment on the relationship between transformational leadership style and ICT integration in teaching and learning in public primary schools.

2. Literature Review

2.1 ICT Integration in Teaching and Learning

For technology to be seamlessly integrated in teaching and learning, it is important that teachers are well versed with technology to the extent that they have confidence to use it in the classroom. Holden and Rada (2011) suggested that by increasing teachers' technology self-efficacy, they might directly increase their acceptance of technology and also indirectly increase their usage of technology. Furthermore, Brown, Holcomb and Lima (2010) asserted that―technology self-efficacy has come to play a crucial role in the preparation and implementation of educators who can successfully use educational technology to enhance learner learning. How would teachers increase technology efficacy in order to adopt ICT in Teaching and learning? Exposure to technology as well as interest in using it would help boost the teachers' self-efficacy in technology. Constant use of the same would give them the confidence they require in its usage. In her study, Farah (2011), gathered that professional development opportunities, more targeted and specialized teacher training on instructional technology and increased knowledge of and access to instructional technology tools and resources are key to teachers adopting use of technology. She further noted that increased teacher collaboration with a focus on instructional technology and creating opportunities for teacher observations and demonstrations.

Through increased teacher collaboration with a focus on instructional technology, teachers would have the opportunity to share, discuss, and explore ways to integrate instructional technology in their instructional practice. This agrees with Duncan's (2010) view where he identified the need to connect teachers and leverage technology to enable us to build the capacity of teachers. He also discussed the benefit of online learning communities which would create opportunities for teachers to collaborate with peers, as well as reach out to experts all over the world. Because teachers are in the trenches teaching learners, they can easily relate to other teachers and provide significant support to their colleagues to help promote effective uses of instructional technology. These ideas are consistent with one of the goals presented in Georgia's technology plan, which states the need to increase teachers' proficiency to use technology effectively in order to enhance learner learning (Georgia Department of Education, 2013).

Different categories have been used by researchers and educators to classify factors that influence teacher use of ICT in teaching. Sherrr and Gibson (2012) claims that technological, individual, organizational and institutional factors should be considered when examining ICT adoption and integration. Rogers identified five technological characteristics or attributes that influence the decision to adopt an innovation namely Relative Advantage, Compatibility, Simplicity, Triability

and Observability (Rogers, 2013). Stockdill and Morehouse (2012) also identified user characteristics, content characteristics, technological considerations, and organizational capacity as factors influencing ICT adoption and integration into teaching. Balanskat, Blamire & Kefalla (2012) identified the factors as teacher-level, school-level and system-level. Neyland (2011), identified factors such as institutional support, as well as micro factors such as teacher capability influencing the use of online learning in high schools in Sidney.

A study done by Lau and Sim, (2008) in Malaysia on "exploring the extent of ICT adoption among secondary school teachers in Malaysia" showed that despite the apparent benefits of the use of ICT for educational purpose, the potential of learning is deprived as many teachers are still not fully ICT literate and do not use it in their teaching. Studies on teacher's readiness for ICT suggest that there is still a long way to go before schools in developing countries are able to take full advantage of the opportunities provided by 21st century technology (So and Paula, 2016). Gobbo and Girardi (2011), Ritz (2012), and Sang et al (2013) all indicate that teachers' ICT literacy levels influenced how learners used ICT in schools.

2.2 Transformational Leadership Style and ICT integration

Success of any institution is pegged on the leadership. Continuous success and prosperity of any institution is directed by the ever-changing situations that impact on leadership. School leaders should take cognizance of this aspect. In the world that we live in today, school leaders' roles have changed from practicing teachers with added responsibilities to full-time professional managers of human, financial and other resources accountable for their results (Bolam, McMahon, Pocklington & Weindling 2010). This has meant that more and more tasks have been added to the job description: instructional leadership, staff evaluation, budget management, performance assessment, accountability, and community relations, to name some of the most prominent ones. In light of the foregoing, this section reviews the concept of transformational leadership style, hailed as the most effective in school management in general and ICT integration in particular (Bush, 2015; Kunwar, 2011; Farah, 2011).

Transformational leaders are proactive, raise awareness levels of followers and help the followers to achieve high performance outcomes. This has been affirmed by Bass, 1990. Transformational leaders pay particular attention to each individual's needs for achievement and growth. Hamidifar (2009) found that employees are more satisfied with transformational leadership than any other style. He also revealed that this type of leadership was not being exercised by the managers. The study concluded that transformational leadership led to better satisfied employees. Nguni, Sleegers, and Denessen (2016) also studied the effects of transformational leadership on teachers' job satisfaction, organizational commitment, and organizational citizenship in schools in Tanzania. They observed that the leadership style was distinguished by the different ways' leaders motivate their followers and appeal to the emotions and values of their followers. The teachers rated their head teachers particularly high on the transformational leadership traits of charismatic leadership, individualized consideration, and intellectual stimulation.

A study by Nthuni (2012) on leadership style factors that influence motivation of pre-school teachers in public pre-schools in Embu North District, revealed that there was need to adopt a transformational leadership style in order to enhance motivation of pre-school teachers in public pre-schools and improve their working environment by involving them in decision making and in policy formulation in their schools. Kibue (2008) study on transformational leadership style on

public secondary schools in Kirinyaga County revealed that majority of head teachers and teachers did not understand nor use the transformational leadership style in schools. This style is still a new concept to many. The researcher concluded that there was need for teachers to be trained and properly inducted on leadership in order to properly manage both human and material resources.

2.3 School Environment

ICT integration in teaching and learning is well enabled by the situations in which it is applied. Well laid out infrastructure and a conducive learning environment ensures that ICT implementation is well entrenched. Thus, a conducive school environment is crucial for successful implementation of ICT in teaching and learning. Freiberg and Stein (1999:11) refer to school environment as the core of the school; the value of a school that brings about a wholesome learning place, where pupils' and parents' dreams and ambitions are tended, and teachers motivated to function at their best, where everybody is respected and feel attached to the school. School environment is defined by Hoy and Miskel (2001:189-190) as a blend of beliefs, values and attitudes of pupils and staff members, head teachers and parents, level of independence, styles of leadership and job satisfaction. From the above definitions, school environment may be perceived as a term used to portray the atmosphere of the school which is mainly influenced by the head teacher and dictates how pupils and teachers perceive their school and affects their values and attitudes toward school and job respectively.

Researchers of school environment, for example Hoy and Sabo (1998) observe that a positive school environment is related to the effectiveness of whole school. This is to say that there is a connection between positive school environment and school effectiveness. In addition to that, Litwin's (1968:28) study reveals that it is possible to create noticeable climates within a short period of time by varying leadership styles. The implication of this is that leadership styles dictate organisational climate. However, most authors on school environment are of the opinion that the perceptions of students and the school community are important components of creating a good climate where teachers can teach and pupils can learn and parents can be involved in the education of their children.

Anderson (2014) conducted a comprehensive review of research studies in the area of school climate and provided a summary of the variables that appeared to be related to climate. Derived from Tagiuri 's taxonomy, Anderson categorized ecology variables as those that include the physical and material variables in the school that are external to participants, such as building characteristics (cleanliness, lighting, and equipment), school size, and classroom size. Variables that represent characteristics of individuals in the school, such as teacher characteristics (number of years teaching), satisfaction, teacher morale, student body characteristics (demographic information), and student morale are referred to as milieu variables. Anderson describes social system variables as comprised of patterns or rules (formal and informal) of operating and interacting in the school. Examples of social system variables include administrative organization, instructional programming, ability grouping, administrator-teacher rapport, teacher shared decision making, communication, teacher- student relationships, student shared decision making, opportunity for student participation, and community school relationships. The last dimension that Tagiuri included in his definition of climate are culture variables. Culture variables reflect norms, belief systems, and

values of various groups within the school such as teacher commitment, peer norms, cooperative emphasis, expectations, degree of consistency, consensus, and clear goals (Anderson, 2014).

Sherman, Gottfredson, MacKenzie, Eck, Reuter and Bushway (2013) reviewed studies that examined school climate and concluded that how schools are run is directly related to the level of behavioral disruptions and therefore school performance. For example, schools in which administration and faculty lack communication have lower teacher morale and higher student disorder, and schools where rules and reward structures are unclear, and where there are vague consequences (lowering of grades due to misbehaviours), experience more disorder. In addition, schools in which students do not believe they belong and feel uncared for by school personnel experience higher levels of disorder (Sherman et al., 2013). Sherman outlined additional school climate factors that contribute to unsafe schools. Schools that ignore misconduct, schools in which teachers and administrators have disagreement about or do not know the rules, and schools where students do not believe in the rules are examples of an unsafe school. On the other hand, factors such as high expectations among school staff, students, and parents for student achievement, orderly school and classroom environments, high morale among school staff and students, positive treatment of students, active engagement of students, and positive social relationships among students positively impact school climate (Sherman et al, 2013).

Griffith (2016) employed the descriptive design to examine how individual- and school-level perceptions of school climate interact with one another in relation to student performance using a sample of elementary school students and found that "group or school-level climate moderated within-school relations of climate to student self-reported academic performance" (p. 360). Despite testing a younger sample of students and using self-reported academic performance as opposed to school-provided GPAs and test scores, Griffith's (2016) findings provide support for the hypothesis that positive aggregate perceptions of school climate will be significantly associated with a stronger relationship between students' individual perceptions of climate and their academic and behavioral performance. Against this backdrop, the study hypothesized that School environment does not have a significant mediating influence on the relationship between Transformational leadership style and ICT integration in teaching and learning (H_0). Accordingly, the hypothesized relationships are conceptualized and as illustrated in figure 1.

3. Methodology

This study was approached from a pragmatism point of view, which was deemed best in underpinning the present study as it allowed for flexibility in approach including the collection of different data types, use of various data collection methods as well as data analysis techniques. The philosophy is further justified as the study involves ICT which is dynamic, involvements of different persons with divergent views and with varied leadership styles.

The study also adopted a mix of cross-sectional survey, correlational and mixed methods design. The study used a cross-sectional survey design since the object of the study was to document the situation as it is at the present time. The survey involved field visits to sampled schools so as to get first hand observation data and views from respondents. The study also employed a correlational study design which is a quantitative method of research in which there are two or more quantitative variables from the same group of participants, and one is trying to determine if there is a relationship (or covariation) between the two variables (that is, a similarity in pattern of scores between the two variables, not a difference between their means). Qualitative methods, particularly

content analysis was also employed in the study as interview schedules were used that provided qualitative data hence mixed methods design.

The target population for this study comprised of public primary schools' teachers drawn from Nairobi County. Nairobi City County was selected as a suitable site for the study because it is a cosmopolitan area with pupils and teachers drawn from different social cultural backgrounds. The study targeted teachers from the 205 public primary schools in Nairobi County (NCEO, 2016). Respondents were drawn from the population of 205 head teachers and 6150 teachers in Nairobi county. Only head teachers and teachers were reached owing to the nature of the study objectives which only required their input. While head teachers were crucial in examining the head teachers' leadership roles in the implementation of ICT in primary school administration, teacher responses were required to determine the moderating role of teacher self-efficacy on the ICT integration in teaching and learning.

The study was conducted in a sample of the public primary schools in the eleven sub-counties of Nairobi County namely; Embakasi, Makadara, Kamukunji, Starehe, Njiru, Kasarani, Westlands, Langata, Mathare, Kibra and Dagoretti. The sample population was 205 head teachers from 205 Public Primary Schools in Nairobi County with 6150 teachers. Owing to the anticipated large number of respondents that included 6150 teachers and 205 head teachers, the study employed a combination of two formulae. For teachers the study used the Fisher et al. (1983) formula for determining sample sizes in large populations; while for head teachers, the study referred to Mugenda and Mugenda (2003) who proposes a 30% proportion in extremely small population sizes and 10% for larger populations. The 10% proportion will be used in the present study giving a sample of 21 head teachers. The Fisher et al. (1983) formula is as shown below:

$$n = \frac{N}{1 + (N * e^2)}$$

Where;
N= population size
e= Tolerance at desired level of confidence, take 0.05 at 95% confidence level
n= sample size.

For teachers, the sample size will be arrived at as follows:
n=6150/(1+(6150*0.05*0.05))
n=375.57
As such, the study was to reach a total of 376 teachers

A combination of cluster sampling and random sampling procedures was employed in the study. Whereas the sub counties formed the clusters random sampling was used to reach the head teachers from 21 primary schools in Nairobi County. The 11 sub-counties formed the cluster from where the sample size (376) of teachers were proportionately drawn.

The instruments used for data collection were structured questionnaires for teachers while the head teachers were taken through an in-depth interview using an interview guide. An observation checklist was further used to assess resources used by the teacher for ICT integration in teaching and learning. Different sets of questionnaires were developed for the teachers.
To test for mediation, stepwise regression analyses was performed as illustrated in equations I, II and III below.

$Me = \alpha + \beta X + \varepsilon$ ….…..………………………………………………………… I

Whereby:
Me = School Environment
α is the y-intercept or model coefficient;
β are the coefficients of the independent variables;
X = Transformational leadership style
ε is the error term established from heteroskedasticity test;

$Y = \alpha + \beta Me + \varepsilon$ ……..………………………………………………………………II

Whereby:
Y = ICT integration
α is the y-intercept or model coefficient;
β are the coefficients of the independent variables;
Me = School Environment
ε is the error term established from heteroskedasticity test;

$Y = \alpha + \beta_1 X + \beta_2 Me + \varepsilon$…………...III

Whereby:
Y = ICT integration
α is the y-intercept or model coefficient;
β_1 are the coefficients of the independent variables;
X = Transformational leadership style
Me = Teacher efficacy (Mediator)
ε = the error term established from heteroscedasticity test;

4. Results
The first crucial step in the analysis was to test the statistical model $Me = \alpha + \beta_1 X + \varepsilon$. Results from Table 1 show the value of R Square = 0.043, p-value < 0.001 meaning that 4.3 per cent of the variation in school environment can be explained by transformation leadership style. From the ANOVA results in Table 1, the model was found to be statistically significant (F (1,293) = 13.124, p-value<0.001) and implies that there was a goodness of fit of the model. This also indicates that transformation leadership is a good predictor of school environment. Given the statistical model $Y = \alpha + \beta_1 X + \varepsilon$, the beta coefficients of transformational leadership in Table show that $\beta_1 = 0.207$, t = 3.623, p-value < 0.001 indicating that a unit improvement in the transformational leadership style contributes to a 0.207 improvement in school environment.
The second crucial step was to test the statistical model $Y = \alpha + \beta_2 Me + \varepsilon$ where Y = ICT integration, α = constant, β_2 = Coefficient of Me, Me = School Environment, ε = Error term. The results are shown on Tables. The model has a significant R Square change = 0.183, p-value < 0.001. In essence, 18.3 per cent of the school environment can be explained by transformational leadership style. The model also demonstrates goodness of fit with F (1, 290) = 65.147, p-value < 0.001. This implies we have a significant regression between ICT integration and school environment. A review of the beta coefficients indicates that $X_1 = \alpha + \beta_2 X_2 + \varepsilon$ results in $X_1 = \alpha + 0.428 X_2$. That is $\beta_2 = 0.428$,

t = 8.071, p-value < 0.001. This implies that a unit improvement in the school environment leads to 0.428 improvement in ICT integration.

The third crucial step was to test the statistical model $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$ where: Y = ICT Integration, α = constant, β_1 = Coefficient of X_1, X_1 = Transformational leadership, β_2 = Coefficient of X_2, X_2 = School Environment, ε = Error term. This is shown in Table 2. There was a significant R Square value = 0.084, p-value < 0.001. This implies that 9.1 per cent variation in ICT integration can be explained by transformational leadership style and school environment. Transformational leadership style alone could account for 4.3 per cent of ICT integration while school environment alone could account for 8 per cent. From the ANOVA results in Table 2, the model was found to be statistically significant (F (1,287) = 14.308, p-value<0.001) and implies that there was a goodness of fit of the model. This also indicates that transformation leadership style and school environment are good predictors of ICT integration. The beta coefficients in Table 2 indicates that the independent variable, transformational leadership style is not significant given $\beta_1 = 0.116$, t = 1.864, p-value > 0.05 for transformational leadership style while is significant at $\beta_2 = 0.232$, t = 3.726, p-value < 0.001 for the school environment. This implies that the school environment has a mediating effect on the status of ICT integration. The null hypothesis, H_0, school environment does not have a significant mediating influence on the relationship between Transformational leadership style and ICT integration in teaching and learning was therefore rejected.

The study concluded that school environment has a significant mediating influence on the relationship between Transformational leadership style and ICT integration in teaching and learning. The finding is in line with Griffith (2016) who employed the descriptive design to examine how individual- and school-level perceptions of school climate interact with one another in relation to student performance using a sample of elementary school students and found that "group or school-level climate moderated within-school relations of climate to student self-reported academic performance".

5. Conclusions and Recommendations

The study also concludes that school environment has a significant influence on integration ICT in teaching and learning in public primary schools. This can be attributed to the conducive environment for the integration of ICT in teaching and learning in a majority of the schools reached. It is particularly noted from the foregoing findings that the school environment across a majority of the schools reached is to a large extent supportive and receptive to the uptake and use of technology in teaching and learning. The environment in most schools reached is particularly characterized by a well-known mission, school buildings in good condition, free interactions between the teachers and learners. There is further, moderate use of technology in teaching and learning as well as moderate involvement of teachers in making decisions, by the administration.

It is further concluded that school environment has a significant mediating influence on the relationship between transformational leadership style and ICT integration in teaching and learning. This can be attributed to the dependence of head teacher practicing the transformational leadership style on the adequacy and richness of the school environment in terms of its endowment with ICT infrastructure, in order to realize effective ICT integration in teaching and learning. The more endowment a school is with ICT infrastructure and administrative systems, the more likely a transformational head teacher's motivation to teachers is likely to result in effective ICT integration.

It is recommended based on the study findings and conclusions that both the administration and Boards of management of primary schools across the country mobilize requisite resource to acquire pertinent ICT infrastructure for use by both teachers and learners in their teaching practice and

learning respectively. It is also recommended that the policy governing teacher training, establishment, improvement, support and maintenance of school environments be reinforced with a view to impart digital skills in trainee teachers, invest in the right infrastructure and reinforce the right school environment. It is also recommended that the Ministry of Education and the related co-actors take measures to improve the school environment, especially in setting up the right infrastructure, and operative policy environment given that the school environment is seen to exert a significant influence on ICT integration.
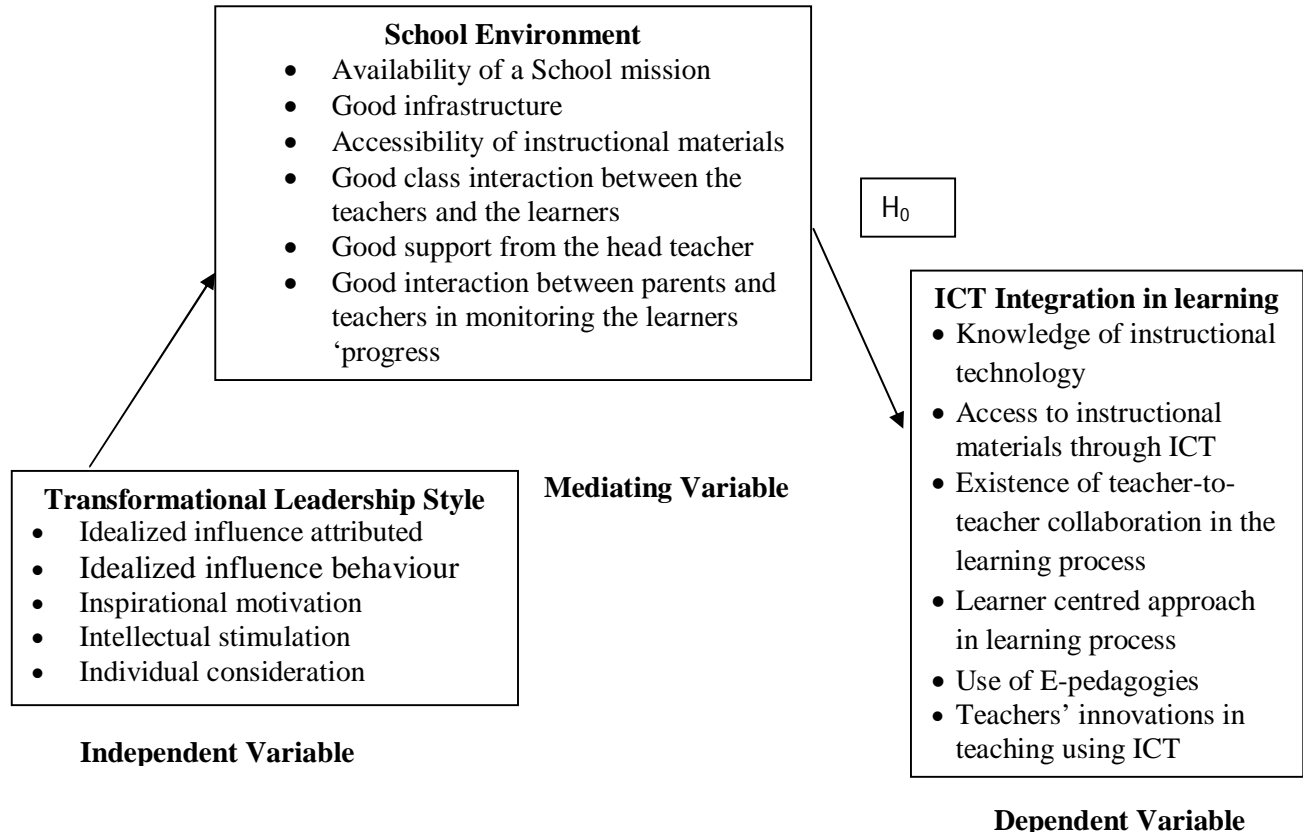
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Appendices

Figure 1: Conceptual Framework

School Environment
- Availability of a School mission
- Good infrastructure
- Accessibility of instructional materials
- Good class interaction between the teachers and the learners
- Good support from the head teacher
- Good interaction between parents and teachers in monitoring the learners 'progress

H_0

Mediating Variable

ICT Integration in learning
- Knowledge of instructional technology
- Access to instructional materials through ICT
- Existence of teacher-to-teacher collaboration in the learning process
- Learner centred approach in learning process
- Use of E-pedagogies
- Teachers' innovations in teaching using ICT

Transformational Leadership Style
- Idealized influence attributed
- Idealized influence behaviour
- Inspirational motivation
- Intellectual stimulation
- Individual consideration

Independent Variable

Dependent Variable

Table 1: Mediating Effect of School Environment: Model Summary (1)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.428[a]	.183	.181	.78363	.183	65.147	1	290	.000

a. Predictors: (Constant), School Environment

ANOVA[a] (1)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.005	1	40.005	65.147	.000[b]
	Residual	178.082	290	.614		
	Total	218.087	291			

a. Dependent Variable: ICT integration
b. Predictors: (Constant), School Environment

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.127	.283		3.976	.000
	School Environment	.611	.076	.428	8.071	.000

a. Dependent Variable: ICT integration

Table 2: Model Summary^b (2)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.301^a	.091	.084	.77015	1.629

a. Predictors: (Constant), School Environment, Transformational Leadership Style
b. Dependent Variable: ICT Integration

ANOVA^a (2)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.973	2	8.487	14.308	.000^b
	Residual	170.230	287	.593		
	Total	187.203	289			

a. Dependent Variable: ICT Integration
b. Predictors: (Constant), School Environment, Transformational Leadership Style

Coefficients^a (2)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.094	.286		3.820	.000
	Transformational Leadership Style	.108	.058	.116	1.864	.063
	School Environment	.307	.082	.232	3.726	.000

a. Dependent Variable: ICT Integration