

# The Role of Information Communication Technology Integration in Instructional Supervision of Secondary School Teachers in Nzau Sub County, Makueni County, Kenya

Peris Syomiti Musembi<sup>1\*</sup>, Patrick Wambua<sup>2</sup>, Henry Embeywa<sup>3</sup>

<sup>1</sup>Masters Degree in Educational Administration, Machakos University, Kenya

<sup>2</sup>Senior Lecturer, Department of Educational Administration, Machakos University, Kenya

<sup>3</sup>Professor, Department of Educational Communication and Technology, Machakos University, Kenya

**Abstract:** Information Communication Technology can have immense benefits in the running of school administration functions. The purpose of this paper therefore is to present the findings of a study whose objective was to determine the role of ICT integration in instructional supervision of teachers in Nzau Sub-County, Makueni County, Kenya. The study adopted a descriptive study design and sampled 105 respondents using stratified random sampling technique. The respondents were principals, deputy principals deans of studies, ICT officers/teachers, bursars, librarians and secretaries. Data were collected using questionnaires, observation and interview schedules and analyzed by descriptive and correlational statistics using Statistical Package for Social Sciences version 27. The findings of the study showed that ICT integration influences instructional supervision of teachers to a great extent (57.2% of the respondents). The Pearson's correlation analysis model was computed and the value was 0.983 implying that there was a very strong positive relationship between ICT and the instructional supervision of teachers. The paper concludes that there is a statistically significance relationship between ICT integration and the running of school administrative functions such as the instructional supervision of teachers This paper recommends that the school principals should train the teachers on how to integrate ICT in the delivery of the curriculum and in the preparation of professional documents.

**Keywords:** administrative duties, curriculum, Information Communication Technology (ICT), instructional, integration, secondary schools, supervision, teachers.

## 1. Introduction

### A. Background to the Study

The use of Information Communication Technology (ICT) in educational institutions is widely accepted across the globe. In most educational settings, learners are permitted to use ICT platforms such as Google Classrooms, Zoom and Microsoft Teams for interactive forum such as discussions, presentations and also for uploading and downloading files, submitting and receiving assignments and even for sitting tests and examinations. The integration of ICT leads to the

computerization of the education sector which may improve the effectiveness and efficiency index in the management practices of not only at school level, but also the entire education sector (Trucano, 2009).

Most schools around the world are moving towards integrating ICT in their operations, both in the teaching and learning process and other management functions. Computers are used for lesson preparations, record keeping, management planning and administration, assessment and tracking of learners' progress, monitoring of the staff performance and communication to parents Chen (2009).

Therefore, schools should have a comprehensive ICT plan that addresses the technology needs of the various school players, that is, the school administration, the teachers, non-teaching staff, students, parents and even suppliers of goods and services. The use of ICT as a teaching tool engages the learners thus improving the quality of the teaching and learning process. Furthermore, ICT can be used in administrative processes such as monitoring and evaluation of the staff, human resource management, procurement and financial management, resource sharing, library services and inventory management (Jegede, Ebio, & Iroegbu, 2019).

In Kenya, the government formulated the ICT strategic policy paper in 2006 and revamped it into the ICT policy of 2019. Both the paper and the policy advocate for the adoption of ICT in the operations of the three arms of government. The Ministry of Education has adopted the use of ICT in the management of learners' records in primary and secondary schools across the country through the National Education Management Information System (NEMIS) while Kenya National Examinations has equally adopted an online system for the registration of candidates at primary, secondary and tertiary institutions.

The use of ICT in school administration in Kenya is a new concept that is now slowly taking shape though it has not received much attention and research. This study therefore

\*Corresponding author: perismusembipm@gmail.com

seeks to evaluate the role of the ICT integration in supporting the school administration in operational managements of secondary schools in Kenya using Nzau Sub-County in Makueni County as a case study.

### B. Statement of the Problem

The government of Kenya has considerably invested significant resources in education transformation by supplying ICT amenities and training of teachers in ICT incorporation in the curriculum. A study conducted by Atandi (2019) in Nairobi schools established that only 2.1% of schools have integrated ICT into teaching and management. These research findings clearly show that the uptake of ICT in school administration in Kenya is still low though the benefits of integrating ICT in school management are immense. Therefore, there is need to investigate the rate and role of ICT integration in secondary schools in Kenya.

This study focussed on Nzau Sub-County as a case study in order to evaluate the extent to which ICT integration in school administration has been adopted by schools in the supervision of teachers. There has been no published study conducted to shed light on the degree of ICT integration in Nzau Sub-county and thus the current study aims to add on the scarcity of information on this region of interest. The current study sought to investigate the extent of ICT integration in administration of secondary schools in Nzau Sub-County, Makueni County, Kenya.

### C. Objective of the Study

The objective of the study was to determine the role of ICT integration in instructional supervision of secondary school teachers in Nzau Sub-County, Makueni County, Kenya.

### D. Research Question

What is the role of ICT integration in instructional supervision of teachers in Nzau Sub-county?

### E. Theoretical Framework

This study was grounded on the Technology Acceptance Model (TAM) which was first developed by Fred Davis, (1989). The model expounds on how people come to accept and use a new innovation or technology (ICT). The model suggests that potential users of a new technology will tend to accept it basing on the perceived usefulness and ease of use of the technology. This model is very relevant to this study because it addresses the key factors of attitude and perceived utility of a new technology as the major determinants of the acceptance, adoption and integration of technology and innovation in the management of schools. The school principals will consider whether the new technology will be useful and easy to use in the running of the administrative function of instructional supervision of teachers through the installation of Closed-Circuit Television (CCTV) at strategic positions in the school that monitors the activities of the teachers and also through the provision of computers that aid preparation, processing and delivery of the academic component in the school.

### F. Conceptual Framework

A conceptual framework is the diagrammatic representation of the relationship between the variables of the study. Figure 1 shows the relationship between the role of Information Communication Technology (ICT) integration and the support in administrative activities in secondary schools in Nzau Sub-County, Makueni County, Kenya.

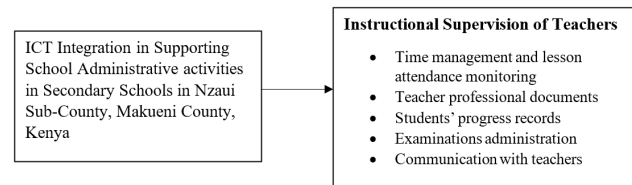


Fig. 1.

## 2. Literature Review

### A. The Role of ICT in Instructional Supervision of Teachers in Secondary Schools

The school principal is expected to supervise both teaching and non-teaching as part of his or her job responsibility. He should constantly collect data about the staff under his control for better decision making as far as the implementation of the school programmes is concerned. Therefore, the deployment of ICT can be an instrumental tool in the supervision of teachers and other non-teaching staff in the school. The school principal should be a champion of the integration of ICT in school administrative functions.

A good integrated ICT system can be used to collect data on all the staff members which will be very helpful in appraising the members. According to Mulinge (2020), such data include the arrival and departure time from school, the amount of time that a teacher attends a lesson, capturing present and absent members of staff and even managing leave days or official leave-out time.

Information Communication Technology can also be used in the preparation of the professional documents and submission through e-mail or shared school intranet platform. Such professional documents include the timetable, academic reports, lesson plans, notices, record of work covered, schemes of work and other academic and non-academic reports. According to Muhammad (2014), teachers can submit these documents to their supervisors with ease regardless of their location. According to a study done in Ghana by Trucano (2006), teachers who use ICT as a tool for teaching are more confident and consistently use it in preparation and delivery of lessons. The lessons are perceived to be easier to understand, interesting and fun.

The use of ICT can be used to monitor the progress of students' academic performance through integration of systems that can track and generate data that can help teachers and school administrators to make informed decisions about a given student. A study conducted by Alazzam, Bakar, Hamzah, & Asimiran (2012) in Pakistani schools established that schools that had incorporated ICT in the teaching and learning process had adopted e-learning system that enabled students to access

learning materials, assignments, assessment scores and even interact with their teachers through an interface created in the system.

The use of ICT can also be used to keep track of learner's academic progress by analyzing the performance in every test or exam. Schools that have large populations of students will find it a challenge to conduct examinations and analyse the results without the use of ICT. An efficient ICT system will be able to collect, collate, analyse and store data on the specific and general performance of learners. Muhammad (2014) avers that a comprehensive examinations management system should be able to not only analyse learner's performance but also communicate the same information to teachers, parents and the school administration.

Adoption of an effective integrated ICT-enabled system for examination preparation and administration has been a challenge in some schools especially in Sub-Saharan Africa. A study conducted by Furusa, Sibanda and Mapenduka (2016) in Zimbabwe on the utilization of ICT resources by some schools established that some schools lacked adequate ICT facilities and infrastructure hence they could not fully integrate all the ICT system into all administrative functions such as examinations preparation, processing, documentation and reporting.

The school administration can leverage on ICT to create social networks that it can act as a channel of communication with the teachers. The most common social media group network is the WhatsApp group for the teachers where official communication can be posted. The schools administration can create other WhatsApp groups for communication with parents and the non-teaching staff. A study was conducted by Mutisya (2017) in Kitui County, Kenya on the extent of ICT integration in the management of public secondary schools established that some principals were using ICT enabled programmes such as emails and Short Message Service (SMS) to communicate with teachers, parents and even suppliers.

### 3. Research Methodology

#### A. Research Design

The study adopted a descriptive study design. A descriptive design as study which is concerned with describing the characteristics of a particular individual or a group (Kothari, 2008). This study was conducted in Nzau Sub-County in Makueni County. Makueni County is in the former Eastern Province of Kenya. The sub-county has 56 public secondary schools.

#### B. Target Population and Sample Size

Target population is the entire set of elements, objects or persons with similar observable characteristics from which the data will be collected (Creswell, 2009). This study targeted all the school principals, school deputies, deans of studies, secretaries, bursars, librarians and the ICT officers/teachers and the Sub-County Director of Education. The total target population was 396 respondents. The study sampled 30% of the respondents as recommended by Mugenda and Mugenda

(2003) using stratified random sampling technique to give a sample size of 120 respondents.

#### C. Data Collection Instruments

This study used the questionnaire as the primary data collection instrument. The questionnaire contained both open-ended and closed-ended question items. The closed-ended questions were measured on a Likert scale of 5 grades. Other instruments were the interview guide with the Sub-County Director of Education and the observation guide to confirm the availability or unavailability of the ICT facilities in the selected schools.

#### D. Validity and Reliability of the Research Instruments

The study ensured validity of the research instrument by subjecting the instrument to a review by subject experts in the area of educational planning and administration. The reliability of the research instrument was tested through test-retest method using the Cronbach's Alpha Coefficient Model. The Coefficient Value was 0.983, which shows that the instrument had a 'excellent' reliability test.

#### E. Data Analysis and Presentation

The quantitative data was analyzed statistically into percentages, frequencies, means, mode, standard deviation and correlation analysis using SPSS Version 27 programme. Qualitative data was collected from interviews and open-ended question items and was analysed through content analysis along thematic areas. The data was then presented in form of narrative summaries.

## 4. Findings of the Study

#### A. Sample Response Rate

The questionnaire response return rate was 87.5%. Therefore, the number of questionnaires that were dully filled and returned were 105. Data analysis was based on this number of respondents. The distribution of the respondents from the filled and returned questionnaires was as follows: principals (14), deputy principals (15), deans of studies (13), ICT officers (16), bursars (16), librarians (14) and secretaries (17).

#### B. The Role of ICT in Instructional Supervision of Teachers

In order to assess the role of ICT in instructional supervision of teachers, the respondents were given statements related to the variable against which they were to rate their level of agreement or disagreement on a Likert scale of 5 grades as follows: Strongly Disagree (SD); Disagree (D); Neutral (N); Agree (A); Strongly Agree (SA). The responses are captured in the Table 1 below.

#### C. Use of ICT to Monitor Teachers' Arrival and Departure Time

The first question asked the respondents as to whether schools have installed ICT programme that monitors the teachers' arrival and departure time to and from school. The responses were as follows: 14.3% of the respondents strongly agreed; 42.9% agreed; 4.8% were neutral; 28.6% disagreed while 9.5% of the respondents strongly disagreed. This question

Table 1

Statement	SD=1	D=2	N=3	A=4	SA=5	N	Mean	St. Dev
Our school uses time attendance software to monitor teachers' arrival and departure time	10 (9.5%)	30 (28.6%)	05 (4.8%)	45 (42.9%)	15 (14.3%)	105	3.24	1.275
Our school uses ICT to supervise teachers' class attendance	30 (28.3%)	43 (41.0%)	07 (6.7%)	18 (17.1%)	07 (6.7%)	105	2.32	1.244
The school administrators use social network platforms for communication with the teachers	00	10 (9.5%)	07 (6.7%)	61 (58.1%)	27 (25.7%)	105	4.00	0.844
Teachers submit their professional documents such as schemes of work and lesson plans online	35 (33.3%)	40 (38.1%)	10 (9.5%)	15 (14.3%)	5 (4.8%)	105	2.19	1.186
Our school uses ICT in timetabling	10 (9.5%)	12 (11.4%)	8 (7.6%)	40 (38.1%)	35 (33.3%)	105	3.74	1.294
Our school uses ICT in exam preparations and administration	15 (14.3%)	18 (17.1%)	7 (6.7%)	37 (35.2%)	28 (26.7%)	105	3.43	1.413
Our school uses ICT for administration of students' academic data	12 (11.4%)	15 (14.3%)	13 (12.4%)	38 (36.2%)	27 (25.7%)	105	3.50	1.324

scored a mean of 3.24 (Std Dev = 1.275) on a scale of 1-5, while the mode response was 4 which had been coded 'agree' on the Likert Scale. The majority of the respondents agreed with the question, implying that most of the schools in Nzau Sub-County use 'clock-in and clock-out' software to monitor teachers' arrival and departure time in school. Further, the software helps to detect cases of teacher absenteeism from school without due permission by the principal.

*D. Use of ICT in Supervising Teachers' Class Attendance*

The second question required respondents to state whether their school uses ICT to supervise teachers' class attendance. The findings show that 28.6% of the respondents strongly disagreed with the question; 41.0% disagreed; 6.7% were neutral implying were not sure about this question; 17.1% agreed while 6.7% strongly agreed. The mean score for this question on a Likert scale of 5 grades was 2.32 (Std Dev = 1.244) while the mode was 2 which translates into 'disagree'. This results show that many of the schools in Nzau sub-county do not use ICT to supervise teachers' class attendance because majority are sub-county day schools with insufficient ICT infrastructure and facilities.

*E. The use of the Social Network Platforms for Communication with Teachers*

The third question tested on whether the school administration uses the social network platforms to communicate with the teachers. The responses were as follows: 25.7% of the respondents strongly agreed with the question; 58.1% agreed; 6.7% were neutral while 9.5% of the respondents disagreed. The mean score was 4.0 (std. dev = 0.844). Generally, 83.8% of the respondents agreed with this statement indicating that almost all the schools have social media platforms where they communicate with staff, both teaching and non-teaching. The most common social media platform for all the staff is the WhatsApp which brings together all the staff of a school.

*F. The Use of ICT for Teacher Submission of Professional Documents Online*

The fourth question enquired on whether teachers submit

their professional documents such as the schemes of work and lesson plans online. The findings showed that 71.4% of the respondents disagreed with this question while 19.1% agreed. The mean of the responses was 2.19 (Std dev = 1.186) while the mode was 2 which had been coded as 'disagree'. This implies that majority of the teachers in secondary schools especially day schools do not submit their professional documents online. This can be attributed to the fact that schools have not fully integrated their ICT facilities for online submission and approval of professional documents. However, when asked whether the teachers use ICT to prepare the schemes of work, 55.2% of the respondents stated in the affirmative, implying that slightly above half of the teachers in Nzau Sub-County, prepare their schemes of work using ICT tools.

*G. The Use of ICT in Timetabling*

The fifth question examined on whether schools use ICT in timetabling. The findings of the study were as follows: 9.5% of the respondents strongly disagreed with the question; 11.4% disagreed; 7.7% were neutral (not sure); 38.1% of the respondents agreed while 33.3% strongly agreed. The mean score was 3.74 (Std dev= 1.294) while the mode was 4 (agree). The findings generally show that majority of schools in Nzau Sub-County have adopted and integrated ICT in lesson time tabling. The integration of ICT in timetabling replaces the manual system of timetabling which is very tedious and time consuming unlike the ICT enabled method.

*H. The Use ICT in Examination Preparation and Administration*

The sixth question examined the use of ICT in examination preparation and administration. The findings from the responses were as follows: 14.3% strongly disagreed with the question; 17.1% disagreed; 6.7% were neutral; 35.2% of the respondents agreed while 26.7% strongly agreed. The mean score was 3.43 (Std dev= 1.413) while the mode was 4 (agree). These findings imply that most of the schools in the sub-county have integrated ICT in exam preparation and administration. This means that internal examinations are prepared using computers and printed within the school. It also implies that in

some schools the examination analysis is done by a computer aided programme.

*I. The Use of ICT for Administration of Students' Academic Data*

The seventh question aimed at collecting data on whether schools in Nzau Sub-County use ICT for administration of students' academic data. The findings from the study were as follows: 11.4% of the respondents strongly disagreed with the question; 14.3% disagreed; 12.4% were neutral (unsure); 36.2% of the respondents agreed with the question while 25.7% strongly agreed. The mean was 3.50 (Std dev=1.324) with the mode of 4 (agree). Generally, 61.9% of the respondents stated that their schools use ICT in the administration of students' academic data.

*J. Information Collected using the Observation Check list*

A spot check by the researcher using a check list confirmed that majority of the schools had installed an integrated ICT system that monitored the arrival and departure of teachers from school, though some schools still used the manual system using a clock-in and clock-out book under the care of the school deputy principal or the secretary. Further, all schools within the sub-county had the following ICT tools and devices installed and operational by the administrative staff: desktop computer/laptop, mobile phone, photocopier and printer. Majority of the schools especially those in the county and extra-county category also had internet connection, projector, T.V, radio, video player, CCTV, digital camera, computer lab and program management soft wares for timetabling and exam analysis. None of the schools in the entire sub-county had an interactive whiteboard.

*K. The Extent to which ICT Integration Influences Instructional Supervision of Teachers*

The study went further to establish the extent to which the integration of ICT influences the instructional supervision of teachers. The respondents were given a Likert scale of 5 grades as follows: 1-very low extent; 2- low extent; 3- moderate extent; 4- great extent; 5-very great extent. The findings of the study are captured in Figure 2.

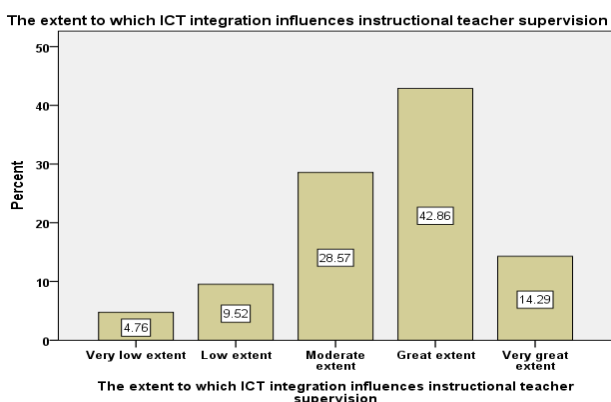


Fig. 2.

The findings indicate that majority of the respondents

(42.86%) were of the opinion that ICT integration influences the instructional supervision of teachers to a great extent while 14.29% said it was to a very great extent. The respondents who felt that the variable influenced instructional supervision of teachers to a moderate extent were 28.57%; while 9.52% stated it was to a low extent; 4.76% of the total respondents were of the opinion that it influenced to a very low extent. The mean score of the responses was 3.52 with a standard deviation of 1.010. The mode of the responses was 4 (a great extent according to the Likert scale). The findings generally show that ICT integration influence instructional supervision of teachers to a great extent.

The interview transcripts from the Nzau Sub-County Director of Education showed there is a communication mechanism, both formal and informal from the ministry of education to the principals on the policy matters relating to the management of schools and that all schools have been advised to install a monitoring system that uses security biometrics and security cameras for effective and efficient monitoring of teachers in the discharge of their duties.

*L. Correlation between Integration of ICT in Instructional Supervision and Supporting School Administrative Activities*

The study computed a Pearson's correlation analysis between the independent variable (instructional supervision of teachers and the dependent variable (ICT integration in supporting school administrative activities in secondary schools). The value for the Pearson's Correlation Moment analysis was 0.983 implying that there is a very strong positive relationship between ICT and the support of school administrative activities. This implies that schools which adopt the integration of ICT in the instructional supervision of teachers will have improved effectiveness and efficiency in the running of the administrative functions unlike those which do not. Principals are therefore encouraged to integrate ICT in their operations if they want to improve their supervision of teachers in terms of curriculum delivery.

**5. Conclusion**

The study established that ICT integration has been adopted in some aspects of school administrative activities such as the monitoring of the teachers' lesson attendance and arrival and departure time from school. However, ICT has not been fully embraced by teachers in the preparation and submission of professional documents.

**6. Recommendations**

This study recommended that all schools in Nzau Sub-County, Makueini County, Kenya, should install ICT integrated systems that monitor teachers in the discharge of their duties. Further, the school principals should train the teachers on how to integrate ICT in the delivery of the curriculum and in the preparation and submission of professional documents.

**References**

[1] Alazzam, A. O., Bakar, A. R., Hamzah, R., & Asimiran, S. (2012). Effects of Demographic Characteristics, Educational Background, and

- Supporting Factors on ICT Readiness of Technical and Vocational Teachers in Malaysia. *International Education Studies*, 5(6), 229-24.
- [2] Atandi, C. (2019). *Effectiveness of Teaching Methods on Students' Academic Performance in Kiswahili Subject in Public and Private Secondary Schools in Lang'ata Sub-County, Nairobi – Kenya*. Unpublished MED Thesis, The Catholic University of Eastern Africa.
- [3] Chen, L. (2009). K 12 online school practice in China. *Campus-Wide Information Systems*, Vol. 26, No.2, pp. 137- 144.
- [4] Creswell, J. W. (2009). *Research Design: Qualitative, Quantitative, and Mixed Methods Approach*. 3rd ed. University of Nebraska-Lincoln: SAGE Publications, Inc.
- [5] Cronbach, L.J (1984). *Essentials of psychological testing (4th Edition)*. New York: Harper & Row.
- [6] Jegede, D., Ebio, L. & Iroegbu, A. (2019). Challenges facing the administration of ICT infrastructural facilities in public primary schools in Nigeria. *Electronic Research Journal of Engineering, Computer and Applied Sciences*, Volume 1 (2019).
- [7] Kothari, C.R. (2008). *Research Methodology: Methods and Techniques*, (2nd Ed). New Delhi. New Age International (P) Publishers.
- [8] Mugenda O. & Mugenda, A. (2003). *Research Methods: Quantitative and Qualitative Approaches*. Nairobi: Acts Press.
- [9] Muhammad, F. (2014). Effective Management and Application of ICT towards the Accessibility to Learning Development in Higher Education. *Mohammad Farid/ Elixir Leadership Mgmt.*, 71 (2014) 24482-24487.
- [10] Mulinge, K. (2020) *Utilization of Information and Communication Technology in Management of Public Secondary Schools in Machakos County, Kenya*. Unpublished MED Thesis, Kenyatta University.
- [11] Mutisya, A. M. (2017) The Extent of ICT in the Management of Public Secondary Schools in Kitui County, Kenya. *International Journal of Education and Research*. Vol. 5, No. 11, pp. 193-204.
- [12] Sibanda, M., Mapenduka, W., & Furusa, S. (2016). Assessment of the Availability and Utilization of ICTs for Teaching and Learning in Secondary Schools - Case of a High School in Kwekwe, Zimbabwe. *International Journal of Scientific & Technology Research*, 5(5), 282-288.
- [13] Trucano, M. (2009). Comparing ICT Use in Education across Countries. A World Bank Blog on ICT Use in Education, Edu Tech, Available at <http://blogs.worldbank.org/edutech/UIS-indicators>