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Effectiveness of HODS professional development on their role performance in ICT integration in teaching learning: A case of Makueni County

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Abstract

The integration of Information and Communication Technology (ICT) in teaching and learning has become a critical component of educational transformation globally. Despite significant investments in ICT infrastructure and policy reforms, effective integration of technology in classroom instruction remains a challenge in many secondary schools in Kenya. Heads of Departments (HODs) play a pivotal role in instructional leadership, curriculum supervision, and supporting teachers in the adoption of innovative teaching practices. This study examined the influence of professional development in ICT integration on the role performance of HODs in secondary schools in Makueni County, Kenya. The study adopted a correlational research design and targeted HODs in public secondary schools. Data were collected using structured questionnaires and analyzed using descriptive and inferential statistics, including Pearson correlation, regression, and ANOVA. Findings revealed a positive and statistically significant relationship between professional development in ICT integration and HOD role performance ($r = .26$, $p < .05$). Regression analysis showed that professional development in ICT integration accounted for 7% of the variance in role performance ($R^2 = .07$), while ANOVA results confirmed that ICT professional development significantly predicted role performance ($F(1,318) = 22.47$, $p < .05$). The study concludes that professional development in ICT integration enhances HODs' effectiveness in instructional supervision, curriculum implementation, and leadership of technology-enhanced learning. The study recommends strengthening continuous professional development programmes focusing on digital leadership, instructional technology, and ICT-supported curriculum supervision.

Key terms: Professional Development, ICT Integration, Role Performance, Instructional Leadership, Heads of Departments, Secondary Schools.

1.0 Introduction

The twenty-first century has witnessed unprecedented technological advancements that continue to transform educational systems across the world. Educational institutions are increasingly expected to integrate Information and Communication Technology (ICT) into teaching, learning, assessment, and administration to improve efficiency and learning outcomes. Consequently, educational leaders are required to possess the knowledge and competencies necessary to guide the adoption and utilization of technology within schools.

Within secondary schools, Heads of Departments (HODs) occupy a strategic middle leadership position that links classroom teachers with school administrators. They are responsible for curriculum implementation, instructional supervision, mentoring teachers, coordinating departmental activities, and ensuring the effective use of teaching and learning resources. As schools continue to embrace digital learning, HODs are increasingly expected to provide leadership in ICT integration.

In Kenya, the government has implemented various initiatives aimed at promoting ICT integration in education, including the National ICT Policy, the Digital Literacy Programme, and teacher capacity-building programmes. However, evidence suggests that the level of ICT integration in classroom instruction remains uneven across schools. This raises questions regarding the preparedness of middle-level educational leaders, particularly HODs, to support technology-enhanced teaching and learning. Professional development has therefore emerged as a critical strategy for enhancing the capacity of HODs to effectively lead ICT integration initiatives.

1.1 Statement of the Problem

Over the past two decades, the rapid advancement of ICT has emerged as a major subject of discussion among education scholars. This is largely due to its potential to create dynamic, interactive, and proactive teaching and learning environments. In today's digital age, teachers are increasingly expected to integrate ICT into their daily practice, moving away from traditional approaches toward modern tools and facilities. This paper focuses on the effectiveness of ICT integration in education. However, embedding technology in teaching is a complex process because of its constantly evolving nature. As such, careful planning for ICT integration is regarded as a critical factor in enhancing improvement and development. Previous studies highlight that in Malaysia, the integration and implementation of ICT in education face numerous challenges, making it a demanding process that requires strategic planning by policymakers and decision-makers.

In the twenty-first century, teachers are encountering new challenges brought about by the growing opportunities for ICT integration across all aspects of the school environment. Research highlights the value of teacher professional development (TPD) that is responsive to local contexts while incorporating global perspectives, and that leverages peer support and the demonstration of effective practices. This paper aims to examine key issues and challenges related to TPD in an ICT-rich era. From this analysis, it spropose a conceptual framework for identifying and assessing TPD approaches that use ICT as a catalyst for educational transformation and innovation. In addition, it offers recommendations for strengthening the connection between research and practice and outlines potential research directions to support evidence-based policy and decision-making.

Given the increasing demands in education, including curriculum reforms and ICT integration in teaching,

HODs require continuous professional development to enhance ICT integration in teaching and learning. This study seeks to evaluate the effectiveness of professional development programs for HODs in Kenya regarding ICT integration and its impact on their role Performance.

1.2 Background to the Study

In all educational institutions around the world, Heads of Departments (HODs) generally act as a link between teachers and the head of the institution in curriculum implementation and delivery of education services. As such, HODs play both horizontal and vertical roles and the quality of learning outcomes largely depends on the effectiveness of these leaders (Lwin, 2022). In recent times, there has been a growing scholarly interest in the role of HODs, their effectiveness and job performance in educational institutions. It is worth noting that HODs play a key role in schools and sometimes perform delegated administrative duties. According to Tebello and Ntjoetso (2021), HODs provide leadership that links the teachers with the school principals. They play a key leadership role in the achievement of departmental targets.

In New Zealand, Post-Primary Teacher Association (PPTA, 2019) findings revealed that HODs have a responsibilities in leadership functions, which significantly impact on students learning outcomes. The findings of the taskforce show that the roles of HODs have expanded. Education reforms have put a lot of pressure on education managers which has caused them to delegate some of their responsibilities to the HODs. As a result, the role of HODs in school leadership has become increasingly demanding (Wylie, 2013). This has greatly affected their role performance in schools. HODs are essential because of their role in curriculum supervision, resource management, leading in ICT integration and offering guidance and counselling within their department.

In USA, Strang (2021) established that HODs play important roles in curriculum implementation in schools. Some of the roles of HODs identified include; supervision of teaching, management of resources and providing leadership in the achievement of educational objectives. The researcher observed that to enhance the role performance of HODs, their professional development is important. The researcher argued that the rapid development of new technologies has greatly changed educational needs and delivery of education services. These changes have been the drivers for the professional development of HODs in an effort to bring them to speed on the current issues in education. Strang also argued that professional development of HODs was necessary to equip them with the management and leadership skills required to effectively execute their mandate.

According to Chen and Chan (2022), some of the roles of HODs in Chinese schools include; planning, management of resources, evaluation of learning progress and development of curriculum tools. The efficacy and quality of teachers and HODs in China is significantly influenced by professional development. The researchers observed that professional development for HODs is essential in enhancing their skills to take on new tasks and bring forth new innovations that may boost student performance. In China, HODs are regularly trained on various aspects in order to improve their skills to meet the changing education needs, such as the use of modern technologies in the classroom and the evolving learning behaviour of the students.

In Tanzania, Raluswinga (2018) states that HODs play a key role in curriculum implementation in learning institutions. To enhance their role performance HODs undergo professional development to improve their management and leadership skills. The knowledge and skills gained enable them to supervise curriculum implementation and effectively play their leadership role to realize educational objectives. Malunda (2019) reported that HODs in secondary schools in Uganda are encouraged to pursue professional development in order to improve their management skills in their role performance. The researcher argued that professional development improves supervision skills of HODs, which enhances their

effectiveness and role performance.

The majority of the scholarly studies related to HOD professional development conducted in Africa have observed that the quality of leadership in teaching remains relatively inadequate. This observation is a pointer to the need to conduct the current research on HODs' professional development and their role performance in ICT integration.This will involve finding out whether professional development is adequate to enhance role performance of HODs in ICT integration in teaching and learning.

2.0 Literature Review

Professional Development of Heads of Department in Integration of ICT in Teaching and Learning and their role Performance

Several studies have explored professional development of HODs in integrating ICT into teaching and its impact on their performance across various countries. In a 2019 study conducted in Punjab, India, Gulzar and Muhammad investigated the influence of ICT on teachers' performance using a descriptive research design. Their sample comprised 102 HODs, and data was collected through questionnaires. Analyzing the data using percentages, means, and standard deviations, the research revealed a positive correlation between ICT integration and HOD performance. Another study done in China by Li and Wang (2020) investigated the use of technology in teaching. The study sample comprised 500 HODs and teachers engaged through the use of questionnaires. The study revealed that technology was an important aspect in learning since it improved student learning. Even though this improved the experience of teachers there are still challenges that bar teachers and HODs from undergoing professional development in integration of ICT.

A study done in Israel by Dorit (2018) investigated professional development in ICT among HODs and teachers to enhance the performance of their students. Data were gathered through questionnaires from 303 participants. The study adopted descriptive survey design and the findings revealed a positive impact of professional development on ICT on the performance of students. The study concluded that the role of ICT cannot be undermined since it has a positive impact on teaching and learning in schools. The findings of this study were important in contributing to the current study with an aim of filling the existing gap in the scanty literature on Kenyan secondary schools.

A study conducted by Dongpin (2021) reviewed the application of ICT and professional development of teachers and HODs. The study used a sample of 85 articles selected between 2013-2019. The selected articles were empirically analyzed and the findings from the analysis indicated that teachers and HODs needed to undergo professional development in ICT to enhance their skills and knowledge regarding ICT integration in teaching. The study focused on using video-based materials in learning and other technological applications that aid in learning. This review was important as it informed the current research to address the professional development of HODs in secondary schools.

Similarly, Blessing (2021) conducted a study in Anambra State, Nigeria, investigating the impact of ICT on teaching among HODs. Through interviews and questionnaires with a sample size of 213, their findings revealed unanimous agreement on the importance of ICT in teaching and its positive influence on student performance.

In another study, Dlamini (2018) explored the significance of professional development for HODs in integrating ICT into teaching and learning in South Africa. The study sample size was 986 and data were collected using structured questionnaires. The findings revealed better performance amongst the HODs who had undergone professional development in ICT. Their role in management and imparting knowledge to their departments had greatly improved after the training. The results demonstrate the importance of professional development of HODs in ICT integration on their role performance. However, the findings may not be generalized to the Kenyan schools hence the need for the current study to address the population gap.

In Tanzania, a study was conducted by Ngeze (2019) to investigate the influence of technology on the HODs and teachers. The study involved 134 respondents. Data collection was conducted using online surveys and analyzed using graphs, tables, percentages, means and standard deviation. The findings revealed that HODs who had undergone professional development tend to encourage teachers in their departments to adopt new teaching technologies. It was also found that the use of technology greatly improves the ability of learners to absorb and visualize knowledge leading to better performance. This study informed the current study in addressing the existing gap in professional development of HODs in ICT integration and role performance.

In Kenya, Cheruiyot and Kibet (2020) conducted a study to investigate the integration of ICT in teaching and supervision among HODs in Nandi County. The study adopted mixed-method research design and data were collected using questionnaires for HODs and interviews for the principals. The sample for the study was 128 HODs and 23 principals selected through stratified sampling technique. The results revealed that HODs monitor and control their departments to ensure performance targets are achieved. The integration of ICT is important in the execution of these critical roles across departments. The current research concentrated on effectiveness of professional development of HODs in ICT integration and the performance of their roles in public secondary schools.

3.0 Conceptual Framework

Fig 1: Conceptual Framework Showing the Relationship Between Professional Development in ICT Integration and Role Performance of HODs

INDEPENDENT VARIABLE

Professional Development in ICT Integration

- ICT Training Workshops
- Digital Leadership Programmes
- Technology-Based Instructional Supervision
- ICT Mentorship and Coaching

↓

Enhances ICT knowledge, skills, leadership capacity, and instructional support competencies among HODs

↓

DEPENDENT VARIABLE

Role Performance of HODs

- Curriculum Supervision
- Instructional Leadership
- Teacher Support and Mentoring
- Coordination of ICT Integration
- Departmental Management

Source: Researcher (2026).

The conceptual framework illustrates the relationship between Professional Development in ICT Integration and the Role Performance of Heads of Departments (HODs) in secondary schools. Professional development, through ICT training workshops, digital leadership programmes, technology-based instructional supervision, and ICT mentorship and coaching, is expected to enhance HODs' ICT knowledge, leadership competencies, and instructional support skills. Improved competencies enable HODs to perform their roles more effectively in curriculum supervision, instructional leadership, teacher support and mentoring, coordination of ICT integration, and departmental management. The framework assumes that increased participation in ICT-focused professional development positively influences the effectiveness of HODs in executing their leadership and supervisory responsibilities.

4.0 Research Methodology

The study adopted a correlational research design because it sought to establish the relationship between professional development in ICT integration and role performance among HODs. The target population comprised Heads of Departments serving in public secondary schools in Makueni County. Data were collected using structured questionnaires designed to capture information on participation in ICT-related professional development programmes and indicators of role performance.

The instrument was validated through expert review, while reliability was established through pilot testing. Data were analyzed using the Statistical Package for Social Sciences (SPSS). Descriptive statistics summarized respondents' perceptions, while Pearson correlation, regression analysis, and ANOVA were used to test the study hypothesis at the 0.05 significance level. Ethical considerations included obtaining informed consent from respondents, assuring confidentiality, and ensuring voluntary participation.

5.0 Findings and Discussions

The null hypothesis $\mathbf{H_{01}}$ There is no significant relationship between professional development of HODs in ICT integration in teaching and learning and role performance in secondary schools was tested.

The results of the Pearson correlation test are presented in Table 1.1

Table 1.1: Correlation Between ICT Integration in Teaching and Learning and Role Performance

		Role Performance
ICT integration in teaching and learning	Pearson Correlation	.26**
	Sig. (2-tailed)	.00
	N	320

Table 1.1 show a positive and statistically significant correlation between role performance and the professional development of head teachers in the area of ICT integration in teaching and learning among HODs in secondary schools in Makueni County ($r(320) = .26$, $p = .00$). Therefore, the null hypothesis was rejected and the alternative one adopted. The results imply that the professional development of HODs in ICT integration in teaching and learning positively influences their role performance.

To determine whether professional development of HODs in ICT integration in teaching and learning could be used to predict the role performance of HODs in secondary schools, regression analysis was carried out. The results are presented in Table 1.2

Table 1.2: Regression Analysis for PD of HODs in ICT Integration in Teaching and Learning and Role Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.26[a]	.07	.06	2.67

a. Predictors: (Constant), ICT

The results in Table 1.2 show a positive relationship between professional development in ICT integration in teaching and learning as the predictor variable and the role performance of HODs as the outcome variables, $R = .26$. The R square value shows that the ICT integration in teaching accounted for about 7% of the total variance in the role performance of HODs. This is indicative that professional development in ICT integration in teaching and learning can be used to predict role performance of HODs.

The researcher conducted ANOVA test to determine whether the predictive value of professional development in ICT integration in teaching and learning could be used to significantly predict role performance of HODs. The results are shown in Table 1.3.

Table 1.3: ANOVA Test

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	160.63	1	160.63	22.47	.00[b]
	Residual	2273.32	318	7.15		
	Total	2433.95	319			

a. Dependent Variable: RP

b. Predictors: (Constant), ICT

Table 1.3 shows that the results reveal that the ICT integration in teaching can be used to significantly predict role performance of HODs, (F (1, 318) = 22.47, p < .05). These findings confirm that ICT integration in teaching is a significant predictor of role performance of HODs.

Having established that PD in ICT integration in teaching and learning is a significant predictor of role performance among HODs, the researcher obtained the predictive values of professional development in ICT integration in teaching on role performance. The results are presented in Table 1.4

Table 1.4: Heads of Departments PD in ICT integration in teaching and their role performance

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	19.95	.31		64.23	.00
	ICT	.05	.01	.26	4.74	.00

a. Dependent Variable: RP

From Table 1.4 the ICT integration in teaching had a regression coefficient of β =.05, p = .00.

The prediction equation for the Model 1 is:

$\hat{Y} = 19.947 + 0.257X_1 + \acute{\varepsilon}$

Where $\hat{Y}$ = Role Performance; X_1 = PD in ICT integration in teaching and learning and $\acute{\varepsilon}$ = standard error. The results indicate that a unit change in ICT integration in teaching leads to 0.26 change in role performance of HODs. These findings show that the ICT integration in teaching can be used to predict role performance of HODs in secondary schools.

Table 1.5 HODs professional development on their role performance in ICT integration

	Role Performance

ICT integration in teaching and learning	Pearson Correlation	.26**
	Sig. (2-tailed)	.00
	N	320

In the above table the findings show a positive and statistically significant correlation between role performance and the professional development of head teachers in the area of ICT integration in teaching and learning among HODs in secondary schools. (r (320) = .26, p = .00. The results imply that the professional development of HODs in ICT integration in teaching and learning positively influences their role performance.

6.0 Conclusions and Recommendations

6.1 Conclusions

The study established that professional development in ICT integration significantly influences the role performance of Heads of Departments in secondary schools. HODs who participate in ICT-related professional development programmes demonstrate improved instructional leadership, curriculum supervision, and capacity to support teachers in technology-enhanced teaching and learning.

The findings affirm that professional development remains an important strategy for strengthening middle-level educational leadership and promoting effective ICT integration in schools. Therefore, enhancing access to continuous ICT-focused professional development opportunities is essential for improving educational quality and supporting the digital transformation of secondary schools.

6.2. Recommendations

Recommendations to Policy

i) The Ministry of Education should institutionalize continuous ICT-focused professional development programmes for all Heads of Departments.

ii) The Kenya Education Management Institute (KEMI should strengthen digital leadership training programmes targeting middle-level school leaders.

Recommendations to practice

i) Secondary schools should establish departmental ICT mentorship programmes to support continuous learning among teachers.

ii) School principals should allocate resources for regular ICT capacity-building initiatives for HODs.

iii) HODs should be trained in the preparation and management of digital professional records, virtual supervision, and data-driven decision-making.

Recommendations for Further Research

i) Future studies should investigate other factors influencing HOD role performance beyond professional development.

ii) Comparative studies should be conducted across different counties to establish regional variations in ICT integration and leadership effectiveness.

iii) Further research should explore the influence of digital infrastructure and school culture on ICT integration outcomes.

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